

Virtual Learning And The Tech Generation Debate

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The term virtual learning encompasses a broad range of topics. It may refer to anything from traditional content, packaged to be accessible to students for distance learning, to fully-interactive and immersive, three-dimensional environments designed to make the learning experience more engaging for the student (Dillenbourg, Schneider and Synteta 2002, Johnson, et al. 1998). This review gives an overview of virtual learning and the ongoing debate over whether or not current and future generations of students will benefit from, or even be unable to learn without, virtual learning techniques in the classroom.

As technology has become more ubiquitous in our everyday lives, so has it begun to permeate academia. Initially, new technologies are often used to perform the old tasks faster or more efficiently, but eventually people begin to use the technology in new and innovative ways that enable them to do things that were impossible or impractical before (Brown 2002). The accessibility of communication networks and the proliferation of portable computing devices have increased the connectedness of our students, both to each other and to massive amounts of digital information (Prensky, Prensky - The Emerging Online Life of the Digital Native 2004, Collins 2008). The question, then, is not whether to use technology in the classroom, but rather how it can best be used. Networks, especially the Internet, have already been harnessed as the “new” way to push information from the teacher to the student. Current innovation appears to be centered on enhancing students’ abilities to collaborate and share knowledge with each other and taking advantage of current computing capabilities to provide richer learning environments (Tapscott 2000, Brown 2002, Calogne 2008, Collins 2008, Bricken 1991, Dillenbourg, Schneider and Synteta 2002). There is a debate, however, over the extent to which traditional methods of teaching should be replaced by high-tech methods (Prensky, Digital Natives, Digital Immigrants 2001, Oblinger 2003) and whether or not the high-tech methods actually result in better learning (Prensky, Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently? 2001, Bennett, Maton and Kervin 2008, Cameron 2005, Dillenbourg, Schneider and Synteta 2002, Owen 2004, VanSlyke 2003, Britain and Liber 2004).

The roots of virtual learning reach back to the mid- to late-1990’s with the rapid adoption of the Internet (Brown 2002). Courses used the Internet to push static

information to students via the World Wide Web and assignments may have been submitted via File Transfer Protocol or over an institution's intranet. Collaboration between students and communication with the instructor was via e-mail (asynchronous) or in text-only chat rooms (synchronous). These capabilities alone, however, did not result in "virtual learning environments" as we think of them today. While there still does not appear to be a clear, definitive standard of what, exactly, a virtual learning environment is, several sources agree on a few aspects. Table 1 shows the overlapping attributes of virtual learning environments as defined in Britain (2004) and Dillenbourg (2002).

Britain (2004)	Dillenbourg (2002)
provides tools for conducting conversations	is a social space for educational interactions
provides interactivity	students are actors and co-constructors of the space
provides an ability to adapt the activities to the needs of the individual student	integrates heterogeneous technologies and multiple pedagogical approaches

Table 1: Attributes common to two different definitions of Virtual Learning Environments

According to Britain (2004), a survey of virtual learning environments conducted in 1999 found that many did not meet the criteria shown in Table 1. The two chief shortcomings were that first generation virtual learning environments tended to have mostly one-way, teacher-to-student information flow and that "learning activities were not easily adapted once the course was underway" (Britain and Liber 2004).

Current generation virtual learning environments meet the definition more completely. Variations in practice include general-purpose, commercial e-learning platforms and virtual learning environments (e.g.: Blackboard Academic Suite); game-based educational programs; simulators and desktop virtual reality; and multi-user, persistent virtual worlds. Britain's final report on the pedagogical evaluation of virtual learning environments is a nice overview of major offerings in the first category, at least in Europe (Britain and Liber 2004), and Farrell takes a look at global trends (Farrell 1999). Prensky appears to be the most outspoken advocate of game-based learning (Prensky, *Digital Natives, Digital Immigrants* 2001, Prensky, *Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?* 2001), although some might consider him biased since his company designs and sells these games. A number of examples of simulators and desktop virtual reality exist, including Johnson (Johnson, et al. 1998) and Arango (Arango, et al. 2008). And the advent of commonly accessible fully-immersive virtual worlds has resulted in a plethora of options. The "Active Worlds Educational Universe includes over eighty educational worlds" (Kelton 2008), and even though it wasn't designed specifically for education, many educators are co-opting Second Life for that purpose (Collins 2008, Kelton 2008, Calogne 2008).

The purported benefits of using virtual technology will depend upon the variation of virtual environment used. In general, though, it is argued that delivering educational content in a high-tech way will result in students who are more excited to learn and

better able to absorb the content (Prensky, Digital Natives, Digital Immigrants 2001, Prensky, Young Minds, Fast Times: The Twenty-First-Century Digital Learner 2008). Those who subscribe to the idea of “Digital Natives” believe that students who

have grown up surrounded by technology exhibit the following characteristics:

- prefer information delivered rapidly (Prensky, Digital Natives, Digital Immigrants 2001)
- are skilled at multitasking (Prensky, Digital Natives, Digital Immigrants 2001)
- prefer viewing graphics rather than reading (Prensky, Digital Natives, Digital Immigrants 2001)
- prefer random, as opposed to sequential, access to information (Prensky, Digital Natives, Digital Immigrants 2001)
- prefer learning through networking and collaboration (Prensky, Digital Natives, Digital Immigrants 2001, Oblinger 2003, Tapscott 2000, Brown 2002)
- prefer games to work (Prensky, Digital Natives, Digital Immigrants 2001)
- are fascinated by new technologies (Oblinger 2003)
- prefer interactive technologies (Tapscott 2000)
- have a desire to create (Prensky, Prensky - The Emerging Online Life of the Digital Native 2004)

While it doesn't appear that the formal definition of virtual learning environments and meeting the preferences of tech-centric students are tightly correlated, in practice, the various available virtual learning environments satisfy Digital Native preferences to a large degree. Even the simplest virtual learning environments at least use technology to provide a common repository of information and asynchronous collaboration tools. Collaboration appears to be one of the most important attributes a virtual learning environment can provide. Two of the common definition points in Table 1 are concerned with collaboration and interaction; and the list above shows that Prensky, Oblinger, Tapscott, and Brown all agree that Digital Natives prefer to learn through networking and collaboration. Brown argues that it is also the collaborative sharing of experiences that provides the reflection needed to organize and give meaning to the massive amounts of information collected in the students' preferred rapid, multi-tasked, and random manner (Brown 2002). Collins also touts the opportunities for "direct contact with real-world practitioners," especially when using publicly-accessible virtual spaces where those individuals may participate (Collins 2008).

Game based learning can be individual or collaborative. Either way, Prensky holds that games keep students more engaged and motivated to learn, and advocates designing them to meet the preferences of students. He offers an example of a computer-aided design software instructional game that met with great success, even while providing information rapidly and in a player-selectable (as opposed to sequential) sequence.

Finally, desktop virtual reality and immersive, 3-D virtual worlds, while they might feel like games, seem to provide the most interactivity of all. In these environments, the students can create content as well as interact with provided content. This interactivity, while meeting their desire to create, also has the benefit of allowing the students to express themselves creatively (Robbins-Bell 2008), perform rapid prototyping, and discover "new ways to study, discuss, create, and express the course subject" (Calogne

2008). Virtualization “allows access to the unreachable or unrealizable; it can provide multiple or alternative representations” (Johnson, et al. 1998); it allows you to “control time, scale, and physics . . . and have entirely new capabilities, such as the ability to fly . . . , to occupy any object as a virtual body, [and] to observe the environment from many perspectives” (Bricken 1991).

Despite these claimed benefits, there are those who are uncertain whether modern students really need to be taught any differently than students in the past, or if virtual learning environments truly add any value. Prensky, Tapscott, Brown, and Oblingers’ claims have been criticized as largely anecdotal without rigorous scientific study (Bennett, Maton and Kervin 2008). Anecdotes contributing to the counterargument cite polls of incoming college freshmen that indicate current students are far less than “power users” of technology (Cameron 2005), refer to historically similar false predictions made about the telephone and television (Owen 2004), or state that “Prensky overemphasizes the difference between [Digital Natives and Digital Immigrants] and de-emphasizes the similarities (VanSlyke 2003). Virtually all counterpoints agree that technology has a place in the classroom *alongside* traditional methods; however, Dillenbourg points out that despite the potential for virtual learning environments to enhance the effectiveness of education, “the past tells us that it is very difficult to set up the conditions that turn potential into actual effects” (Dillenbourg, Schneider and Synteta 2002).

There are many virtual learning solutions currently available, and more are likely to appear. Regardless of whether or not one believes that students today are fundamentally different than students of the past, technology can and should still be leveraged by good teachers as much as possible to make education more efficient and enjoyable. Further scientific study must be done, though, to determine the validity of the claims that a radical change in approach is needed.

References

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Tapscott, Don. "The Net Generation and the School." *Milken Family Foundation*. 2000. http://www.mff.org/edtech/article.taf?_function=detail&Content_uid1=109 (accessed March 24, 2009).

VanSlyke, Timothy. "Digital Natives, Digital Immigrants: Some Thoughts from the Generation Gap." *University of Wisconsin Madison Technology Source*. May/June 2003. <http://www.wisc.edu/depd/html/TArticles/Digital%20Natives.htm> (accessed March 24, 2009).

Annotated readings:

Bennett, Sue, Karl Maton, and Lisa Kervin. "The 'digital natives' debate: A critical review of the evidence." *British Journal of Educational Technology*, 2008: 775 - 786.

This paper is a rational and objective criticism of the Digital Native idea. It does not dispute the idea that current generations of students learn differently than past generations as much as it criticizes the lack of experimental evidence for those claims. The authors claim that the sense of urgency for changing education (*now!*) is an "academic form of a 'moral panic'" and that we should be cautious in implementing widespread changes before we know the utility and impact of those changes. The authors propose measured and disinterested study of these attributes to confirm the

anecdotal evidence. The paper includes a very nice list of references covering the issues.

Britain, Sandy, and Oleg Liber. "A Framework for Pedagogical Evaluation of Virtual Learning Environments (Final Report)." 2004.

One of the most important tasks when incorporating a virtual learning environment is choosing the right tool for your objectives. This report describes a framework for evaluating virtual learning environments and then compares several major offerings. It is a thorough comparison and evaluation that can even be adapted for virtual learning environments that are not covered in the report.

Brown, John Seely. "Growing Up Digital." *USDLA Journal*, 2002.

One of the biggest concerns many educators have about fast-paced virtual learning is that it does not afford students the opportunity to reflect on what they learn and organize it in their minds. This paper explores the way we learn and form new knowledge without technology. It then explains how technology might be used to facilitate the same mental activity in a different way. Brown observes that much learning comes from the telling and hearing of experiential stories. This is likened to the collaborative learning provided through networked virtual environments.

Cameron, David. "The Net Generation goes to university?" *Proceedings of the Journalism Education Association Conference*. 2005.

This paper is typical of the counterargument against Digital Natives (a.k.a. the Net Generation). Somewhat less anecdotal than the others, this paper is based on a survey of the self-assessed skills of an incoming freshman class of an Australian university. The recent date of the paper indicates that, at least at the college level, the Digital Natives may not yet have arrived in the classroom.

Dillenbourg, P., D.K. Schneider, and P. Synteta. "Virtual Learning Environments." *Proceedings of the 3rd Hellenic Conference "Information & Communication Technologies in Education"*. 2002. 3 - 18.

This paper is a good overview of what a "virtual learning environment" is and some of the potential benefits of using them. Despite identifying potential benefits, the authors do not appear to have a high degree of confidence that the potential can be fully realized in application. Regardless, the authors' goal is not to prove the potential, but rather to provide an understanding of the effects.

Oblinger, Diana G. and James L. Oblinger, Eds. *Educating the Net Generation*. Educause, 2005.

This book, published by Educause, is actually a collection of chapters, written by various authors, covering topics relevant to teaching the Net Generation. It is a cornucopia of foundational theories and teaching techniques to be used with the Net Generation. It is very comprehensive and a must-read for anyone who wants to incorporate these ideas in their classroom.

Prensky, Marc. "Digital Natives, Digital Immigrants." *On the Horizon*, 2001.

Prensky, Marc. "Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?" *On the Horizon*, 2001.

—. "Prensky - The Emerging Online Life of the Digital Native." *MarkPrensky.com*. 2004. http://www.marcprensky.com/writing/Prensky-The_Emerging_Online_Life_of_the_Digital_Native-03.pdf (accessed March 24, 2009). It does not seem possible to research the idea of the Net Generation or Digital Natives (Prensky's term) without finding one of these papers referenced. Prensky insists (without providing strong evidence) that current and future generations of students have been *physically* changed by technology in a way that will make it impossible to learn, what he terms, "legacy content." He is a fierce advocate of game-based learning. Most of his data is based on intuition or anecdote and includes ad-hominem attacks on those who disagree with him, calling these educators "dumb," "lazy," "ineffective," and unimaginative. Nevertheless, no study of the topic is complete without these papers.

Tapscott, Don. "The Net Generation and the School." *Milken Family Foundation*. 2000. http://www.mff.org/edtech/article.taf?_function=detail&Content_uid1=109 (accessed March 24, 2009).

One of the seminal works proclaiming the advent of the Net Generation (Tapscott's term), this article differs from Prensky's arguments in a significant way: Tapscott doesn't push an argument for a physiological change in the brains of Net Generation students, he only acknowledges that we are, to a certain extent, products of our environment. The Net Generation's environment is increasingly technology-based, and this is creating students who crave a different sort of interaction with knowledge. Tapscott focuses much on the need to make learning interactive, collaborative, and learner-centered. He advocates the use of technology to enable these methods.

Extended bibliography of related publications:

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