

# The Student-Teacher Digital Divide and Six New Technology Roller Coaster Rides

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**M**y first encounter with the Beloit College Mindset List was in 1998. Reading the worldview of students 15 years younger was amusing, but not alarming. Over the last decade the gap has widened considerably. The latest list includes such items as, "MTV has never featured music videos" and "Avatars have nothing to do with Hindu deities" (Nief & McBride, 2008).

Scary. At one time I remember explaining that the read/write head of a hard drive was similar to the arm on a record player. Today I would be more likely to use the read/write head on a hard drive to demonstrate how a record player was used. The digital divide between what Prensky (2001) coined as the "digital natives" (students) and the "digital immigrants" (faculty) is widening at an increasing rate. As Prensky noted, "the single biggest problem facing education today is that our Digital Immigrant instructors, who speak an outdated language (that of the predigital age), are struggling to teach a population that speaks an entirely new language" (p. 2).

The increasing digital gap is apparent in many digital markers. The first commercial text message was sent only 16 years ago. eBay was founded 12 years ago. Google came out of beta 9 years ago and yet currently has more than 135 million U.S. visitors each month, creating over 2.7 billion unique searches, staffed by more than 10,000 people worldwide (Google, 2008). YouTube serves over 3 billion videos each month (Yen, 2008). The total volume of digital information is doubling every 2 years (Gantz, 2008). We are currently educating students for jobs that do not yet exist, dealing with technology that has not been invented, to solve problems that we are not even aware of yet. As digital immi-



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grants, we teachers are increasingly teaching in a nonnative language. The long-term solution may be to wait for a new generation of digital educators, native speakers who cannot remember the fall of the Berlin wall or the rise of Walmart. In the interim, faculty must continue to ride the digital roller coaster that is technology in education.

A quick survey of the digital horizon reveals a host of potential technologies ready to explode into educational environments. Webware, mobile broadband, collaborative workspaces, video capture, video sharing, social operating systems, community tagging, geotagging, multitouch input devices, virtual worlds, immersive simulations, social networking, scholarly mashups, collective intelligence, open educational resources, and alternative interaction devices all show great potential in the next few years. How faculty and students view this list of educational technologies is disparate and widening. Students tend to embrace these new technologies (like Facebook) more quickly than do faculty, often on their first exposure. Faculty, on the other hand, may require multiple links to tools like Google Docs, Ning, and Swivel before adopting. The technology roller coaster may be a bit daunting; many twists and turns, rapid accelerations, unexpected drops, not to mention those that turn completely upside down. The following list of emerging technologies is designed to provide an additional link for faculty to turn anxiety-laden technology rides into exciting rides for both faculty and students. To that end, sit back, pull the safety bar firmly across your lap, relax, and enjoy the ride. The following list is a quick summary of general and specific technology tools and pedagogies that will impact education in the next 5 years.

### **INEXPENSIVE VIDEOS**

Starting with an area that has likely touched every discipline, the inexpensive

video (also grassroots video or multimedia video) arena includes video capture, manipulation, storage, and distribution. While most educators are aware that this phenomenon exists, the sheer number of available videos, and its continuous exponential increase, makes this one of the most engaging new technologies. Its full potential is obviously still untapped. With the proliferation of inexpensive video capture devices (like cell phones), free editing software, and ubiquitous wired and wireless broadband connectivity, almost anyone can author and distribute short videos. The 2008 Horizon Report notes that “the popularity of video is providing new outlets for creativity and enabling literally millions of individual voices to be heard” (The New Media Consortium & EDUCAUSE Learning Initiatives, 2008). Every event (whether major or not) is the potential target of multiple capture devices from multiple angles; with minimal training and almost no expense, virtually anyone can show off their creative flare.

To investigate the creation and use of inexpensive videos, a great starting point is “mashable.com.” Mashable’s video toolbox includes 150 various video mixers, converters, mashups, and video sharing sites to get started. One of the primary benefits of the inexpensive videos for universities is the access to free services, like YouTube, for hosting video content without infrastructure or equipment costs. Imagine the impact of creating a YouTube contest to design the best campus recruiting video.

### **ONLINE COLLABORATION WEBS**

Online collaboration tools that once cost thousands of dollars and required specialized expertise are now free (or nearly free) and may not even require installation. Swapping files, tracking changes, holding meetings, and editing group documents may now be performed from within most Web browsers. Educators have always relied on a strong network of collegial con-

tacts. With the advent of the Internet and universal browsers, the barriers of time and place have fallen and the contact lists have grown. Collaborating on projects from around the globe is now routine (The 2008 Horizon Report, 2008).

The Flat Classroom Project (<http://flatclassroomproject.ning.com/>) is a great example of using online collaboration tools so that high school students can meet with their peers from around the world. Other standouts include GoogleDocs and Zoho Office; both include free office suites similar to Word, Excel, and PowerPoint in addition to workflow and collaboration software. There are also specialized-office collaboration software groups worth investigating: (1) for photo workflow there is Splashup; (2) for video workflow there is Jumpcut; (3) to present or publish presentations, use sites like Slide and SlideShare; and (4) social networking sites like Ning and Facebook are designed specifically to bolster collaboration. The various collaboration technologies make it extremely easy for educators and learners to share files, share interests, share ideas, work together on a project, collaborate in teaching, and communicate among peers.

## **MOBILE BROADBAND**

Mobile broadband is a marriage of mobile devices and near ubiquitous broadband Internet access. Mobile devices have evolved from the clunky portable phones of the 1980s and 1990s to miniaturized multipurpose devices capable of including cameras, audio recorders, video recorders, address books, calendars, Web browsers, news readers, document editors, photo albums, and music players, the purpose being to bring the Internet and other collaboration to our fingertips anytime, anywhere. Some examples of mobile broadband in educational environments are the Zone Tag project ([zonetag.research.yahoo.com](http://zonetag.research.yahoo.com))—after taking a picture with a mobile device and uploading it to Flickr,

Zone Tag can tag the photo with the current location. The Wiki City Rome project ([senseable.mit.edu/wikicity/rome/](http://senseable.mit.edu/wikicity/rome/)), part of the Senseable City project at MIT, uses real-time data collection from mobile device sensors to track information about the state of the city and provide that information to mobile users.

As a direct measure of the infiltration of mobile broadband to campus life, Abilene Christian University became the first university to provide an iPhone (or iPod) to all of its incoming freshmen in fall 2008 so student can “receive homework alerts, answer in-class surveys and quizzes, get directions to their professors’ offices, and check their meal and account balances—among more than 15 other useful Web applications already developed” (Abilene Christian University, 2008). With more than a billion new mobile phones being manufactured each year (Jaques, 2007), the continuous advancement and innovation, decreasing hardware and service costs, and the fact that almost all students in the U.S. already own a mobile device, extensive mobile connectivity in education is right around the corner.

## **SECOND LIFE**

Moving from the general technology rides to more specific technology rides, in the category of immersive learning environment Second Life is the 800 pound gorilla. More students are entering universities with expectations of experiential learning versus traditional lecture or discussion. They wish to be immersed in virtual worlds like World of Warcraft and look for learning in games, simulations, visualizations, and remote instrumentation. Second life is a virtual online world that began in 2003. Today it is the largest virtual world, with over 13 million registered users (EDUCAUSE, 2008a). It has a real economy based on Linden dollars, but anyone can join for free. Second Life recently added voice over Internet protocol, which lets users speak to

one another via headsets and microphones.

Academic areas, such as journalism, foreign language, and multimedia are uniquely suited to the immersion encouraged by Second Life. All disciplines may use the tools in second life to enhance the educational experience via virtual field trips and peer-created digital project presentations. In addition, the virtual world training itself will prepare students for the near future, when entities such as retailers, embassies, and even the Department of Motor Vehicles go online in 3D to satisfy customer interaction. The list of educational activities in Second Life is nearly endless. Artists have galleries, musicians hold concerts, poets read created works, authors display their latest creation, and counseling services are available with real therapists. Many colleges, universities, departments, and faculty have created a presence in Second Life for online courses as well as virtual campus visits, recruiting activities, and fund-raisers (EDUCAUSE, 2008a). The bottom line: Second Life offers a synchronous experience for geographically separated users to interact, and it can be used as an alternative for the real world for activities and research that may not be accessible in the real world.

## **NING**

Ning is an online application and collaboration site that facilitates the creation and association of social networks. Users may create and join as many networks as they like. Ning allows the network site creator to determine the site's appearance, functionality, and whether the site is public or private (EDUCAUSE, 2008b). The application includes toolsets for posting photos, videos, member lists, events, schedules, forums, and blogs. The most inviting features for faculty are: (1) it does not require technical skill to set up, (2) there are no limits to the number of networks a user can join or the number of members in a

network, and (3) the application has a decidedly academic slant to it. A quick search reveals a smorgasbord of educational topics with vast networks available: chemistry, physiology, communications, government, and many others.

As faculty, joining students in social networking sites like MySpace or Facebook might be seen as an invasion of privacy; with Ning, the same functionality is achieved with less intrusion and a decidedly neutral platform. As with Second Life, creating social networks around academic topics, specific projects, or an entire course can foster a sense of community. In addition, adding social networks may be used to strengthen the sense of community for incoming freshmen, for transfer students, for students at home on summer vacation, or even to connect student participating in a semester-abroad program. For universities, a benefit of increasing students' sense of community is an increase in student retention (Mabry, 2007).

## **MULTITOUCH INTERFACE**

While this ride may look a long way off, it will likely be in the classroom within the next four years. A multitouch interface is an input device that recognizes two or more simultaneous touches, allowing multiple users to interact with a computer simultaneously. Each user may use multiple digits to enter natural commands through various gestures on or near the surface. Several variations include the ability to sense temperature and pressure. Multitouch technology incorporates digital (as in fingers) interactions of swipes, pinches, rotations, and expansions to more naturally control digital (computer) content. Examples of the intuitive commands include the ability to resize a photo with two fingers (stretch and pinch) or rotate a video around one finger (pivot point) with a second finger. The multitouch interfaces create a digital approximation of interacting with a stack of printed photos or vid-

eos. As an indication of the trend to improve human-computer interaction, one notable attribute of this tool is the absence of a required manual or training. Further highlighting the gap between digital immigrants and natives is that this feature will likely be touted by faculty as an improvement, while students will assume that's just the way it should have been all along.

## CONCLUSION

In a world where considerable advances in technology are not only expected, but surpassed, the next generation of learners will undoubtedly be better digital language speakers due to the increased reliance on technology. They will have shorter attention spans, more digital connections, more personal connections, and fewer wired connections. Engaging faculty will incorporate a variety of media (audio, video, animations, and text) as varied in composition as in content (Windham, 2005). Merely presenting material and expecting native digital speakers to recite it back will not meet the needs of students who have never "rolled down" a car window. To maintain relevancy, the modern classroom will need to include more technology content and more technology pedagogy or it may fade like the land-line; students of the first digital generation use the term "off the hook" to refer to food, not a telephone.

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