

NMC Horizon Project

2007 Short List

Time-to-Adoption Horizon: One Year or Less

- Online Collaboration: Easy, Accessible, and Virtually Free
- User Content: It's All about the Audience
- Social Networking: The Reason They Log On.
- Can You Hear Me Now? The Resurgence of Audio

Time-to-Adoption Horizon: Two to Three Years

- Your Phone: The Gateway to Your Digital Life
- The New Video is Smaller than You Think
- Virtual Worlds, Real Opportunity
- Mapping Goes Mainstream: It's Not What You Know, It's *Where* You Know

Time-to-Adoption Horizon: Four to Five Years

- The New Scholarship and Emerging Forms of Publication
- Massively Multiplayer Educational Gaming
- Personal Learning Environments
- Internet-Wide User-Centric Identity Systems

The 2007 Horizon Report, for which this document is a precursor, is a collaboration between the New Media Consortium and the EDUCAUSE Learning Initiative, an EDUCAUSE Program. For more information on the project and the process behind the Horizon Report, see the project wiki at www.nmc.org/horizon/wiki

© The New Media Consortium, 2006

Time-to-Adoption: One Year or Less

Online Collaboration: Easy, Accessible, and Virtually Free

One of the several categories of Web 2.0 technologies featured in the Horizon Report this year, online collaboration tools allow people to create and share documents or collections of resources—whether these are spreadsheets, text files, photographs, blog entries, audio or video clips, favorite places, or web links. What makes these tools effective is that collaboration and compatibility are built right in; no special process is required to make your media usable by or shareable with, someone else. Issues of file format, operating system compatibility, disk storage space, and versioning, all of which can stand in the way of productive collaborative work, virtually disappear. Most of these tools are accessible from a web browser and data is stored remotely, on a server, rather than locally on a user's own computer.

The value of these tools for education may lie in their ability to connect people and facilitate work without the need to consult a central technology support center. Researchers, project groups, and study groups can select only the tools that they need and set them up on their own, often simply by agreeing to use one particular tool or another or sharing usernames for services they already employ. Inter-institutional collaboration has become more common, and these tools support the kinds of work that happens at a distance. These tools also lend themselves to classroom applications, providing a space where work begun in the classroom can be seamlessly carried on outside of class.

Relevance for Teaching, Learning & Creative Expression

- Makes it easy to cross institutional boundaries to work collaboratively on projects and research
- Enables students to work together on projects, sharing notes, documents, and research
- Supports groups working together at a distance

Examples

- Ben Rimes describes educational applications of collaborative concept mapping in *The Tech Savvy Educator* blog: www.techsavvyed.net/?p=164
- A weblog and dynamically tagged resource list is an ongoing complement to an educational technology course offered at UBC: weblogs.elearning.ubc.ca/textologies/links.html

For Further Reading

Web's Second Phase Puts Users in Control

(Steve O'Hear, *The Guardian*, June 20, 2006).

This brief article discusses several web-based tools and describes potential applications to education. education.guardian.co.uk/elearning/story/0,,1801086,00.html

Back to School with the Class of Web 2.0

(Brian Benzinger, *Solution Watch*, Sept. 29, 2006).

This blog post reviews more than 35 online educational tools for organizing, grading, community building, notetaking, research, media sharing, and more.

www.solutionwatch.com/512/back-to-school-with-the-class-of-web-20-part-1/

Riding the Waves of "Web 2.0"

(Mary Madden and Susannah Fox, *Pew Internet & American Life Project*, October 5, 2006).

This report provides a short history of the phrase "Web 2.0" and presents statistical data to help frame a discussion around the online activities and applications related to the term.

www.pewinternet.org/PPF/r/189/report_display.asp

Time-to-Adoption: One Year or Less

User Content: It's All About the Audience

Another family of Web 2.0 technologies—tagging and folksonomic tools, social bookmarking sites, and sites that make it easy to contribute ideas and content—is placing the power of media creation and distribution firmly into the hands of “the people formerly known as the audience” (Rosen, 2006).

Sites like *Flickr*, *Odeo*, *YouTube*, *Google Video*, and *Ourmedia* make it easy to find images, videos, and audio clips, but the real value of these sites lies in the way that users can classify, evaluate, and add to the content that is there. The emergence of collective wisdom through tagging allows interesting materials to quickly float to the top and be found. Naturally, these materials are not necessarily all related to learning or creativity, but the process does highlight what people are paying attention to. The challenge for us as educators is to figure out how to harness that power in a learning context.

Pervasive use of these tools is already in evidence among students, and this will only grow in the coming months. The social aspects of these audience-centered technologies, firmly established as powerful tools for creative expression, offer great potential to build community in the context of teaching and learning as well. Nonetheless, we face a significant challenge as we seek to marshal these techniques in the service of education, as this aspect of the new web turns the traditional view of what a website should be on its head.

Relevance for Teaching, Learning & Creative Expression

- Reframes the web with tools that can give voice to communities and encourage idea sharing
- Creates new forms of distribution for student work and new forms of publishing
- Allows (and encourages) shared responsibility for development of course resources, links, and materials

Examples

- PennTags allows the University of Pennsylvania Community to identify and organize resources by tagging: tags.library.upenn.edu/
- Uth TV (pronounced “youth TV”) is an online community of young people sharing original works of video, audio, and other media: www.uthtv.com/

For Further Reading

The People Formerly Known as the Audience

(Jay Rosen, *PressThink*, June 27, 2006).

The people formerly known as the audience wish to inform media people of our existence, and of a shift in power that goes with the platform shift you’ve all heard about.

journalism.nyu.edu/pubzone/weblogs/pressthink/2006/06/27/ppl_frmr.html

Folksonomies: Tidying Up Tags?

(Marieke Guy and Emma Tonkin, *D-Lib Magazine*, January 2006.)

This paper looks at what makes folksonomies work.

www.dlib.org/dlib/january06/guy/01guy.html

Social Bookmarking: Mark It, Manage It, Share It

(Mary Beth Lakin, *American Council on Education Website*, June 2, 2006).

This brief article describes social bookmarking and suggests possible educational uses.

www.acenet.edu/AM/Template.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=16057

Time-to-Adoption: One Year or Less

Social Networking: The Reason They Log On

Undoubtedly the most pervasive aspect of Web 2.0, the focus on social networking is driven from outside our institutions. Interest in social networking is especially high among students, and they already use these tools extensively for personal reasons. Because of students' tremendous interest, colleges and universities are increasingly going to be seeking ways to employ similar strategies. Although there are not yet many institutional examples of social networking, there are easily dozens of examples that are familiar to students and used by them on a daily basis; institutional uses will emerge very quickly because these approaches clearly appeal to students.

Social networking is all about making connections between individuals. Conversations that take place in social networking contexts are inherently social, and most likely related to social activities and interests. These topics foster deep connections between people when they are shared and discussed: forming such connections is the heart of social networking. As danah boyd has noted, online spaces like *Myspace* and *Facebook* give students a safe place to gather, in much the same way that young people of previous generations hung out at the burger joint, the roller rink, or the mall. Social networking is second nature to students already and the impetus for us to use it is coming from them. For them, it is ubiquitous now; our challenge is to apply it to education.

Relevance for Teaching, Learning & Creative Expression

- Shared user profiles are a way for students to combat the feeling of being “just a number.” The easy ability to form affinity groups (friends) encourages community and self expression.
- Provides virtual spaces where students can interact and gather.
- Students love these things —social networking approaches are engaging.

Examples

- Allegheny College sets up a *MySpace* page:
syndicateblog.petersons.com/wordpress/index.php/mike-richwalsky-on-allegheny-colleges-myspace-and-other-online-social-networking-plans/
- *Stu.dicio.us* is a notetaking tool that lets students take and share notes, quickly link to *Wikipedia* and *Google* entries for keywords, keep track of assignments, and more: stu.dicio.us/
- Students share and seek opinions about 770,000 professors from 6,000 schools:
www.ratemyprofessors.com

For Further Reading

social network sites: my definition

(danah boyd, *Many2Many*, November 12, 2006). Describes social networking and offers examples.
many.corante.com/archives/2006/11/12/social_network_sites_my_definition.php

Mashable!

(Pete Cashmore, retrieved November 15, 2006). Mashable! is a blog focused exclusively on social networks—a meta-collection of social networking sites, with commentary:
www.mashable.com

How University Administrators Should Approach the Facebook: Ten Rules

(Fred Stutzman, *Unit Structures*, January 23, 2006). Describes current trends around Facebook and recommends measures for university administrators.
<http://chimprawk.blogspot.com/2006/01/how-university-administrators-should.html>

Time-to-Adoption: One Year or Less

Can You Hear Me Now? The Resurgence of Audio

All over the web, new voices are emerging—literally. Recording, editing, and distributing audio has never been so easy, and it is quickly becoming a popular way to express opinions, create parodies, make social commentary, and broadcast lectures and talks. Just one of the many audio-related sites, *Odeo* (odeo.com), has over two million audio files in mp3 format available free. These clips range in length from a few seconds to several minutes and cover topics from business to music, science to sports, news, television, and more.

These short clips are another expression of the new creative audience. Podcasting was one of the early uses of audio capture and distribution, but we are now seeing new forms, including short interviews, group discussions, synchronous voice-over-IP (VoIP) audio conferences of up to a hundred people, and recordings of keynotes, performances, and courses. Recording equipment is readily available, whether it's an *iRiver*, a cell phone, or software that works with a VoIP provider like *Skype*. We are rapidly approaching the point when any instructor can capture and distribute a lecture online by walking into the room and pushing a button labeled "record this class."

Relevance for Teaching, Learning & Creative Expression

- Digital audio is portable and has many natural applications, such as foreign language study, access to historical commentary and speeches, and topical review.
- Audio is rich media — and especially appealing to auditory learners.
- Audio is a convenient vehicle for time shifting content. Audio materials and programs often compliment other activities such as commuting, exercising, or simply relaxing.
- Audio conveys more information than text, including cues to mood and meaning, making it especially valuable to researchers, journalists, and interviewers in any field.

Examples

- A team of professors at the Indiana University–Purdue University, Indianapolis and Saint Mary's College of California are teaching film analysis via a "serialized academic text" recorded in the form of podcasts: outofthepast.libsyn.com
- *Science on Odeo* provides links to hundreds of free scientific programs produced by NPR, the Discovery Channel, ABC News Medical Minute, the CBC, and more: odeo.com/science
- At the University of Cincinnati, a faculty member is providing students with detailed feedback via audio commentaries: <http://www.academiccommons.org/ctfl/vignette/digitized-audio-commentary>

For Further Reading

Five Steps to Designing Podcasts that Teach

(retrieved November 14, 2006 from University of Wisconsin-Madison). This short how-to article explains how to design and create an educational podcast, focusing on the educational value rather than on the technology.

engage.doit.wisc.edu/podcasting/teachAndLearn/

Beyond Text: Using Your Voice Online

(Retrieved November 14, 2006). This project has explored the application of online voice technologies in different learning contexts and with different learner groups to develop models of practice and practical guides for teachers in Australia wishing to move beyond text and integrate online voice technologies into online delivery, assessment and support services.

http://btresource.flexiblelearning.net.au/beyond_text_resources/bt/index.htm

Time-to-Adoption: Two to Three Years

Your Phone: The Gateway to your Digital Life

Mobile phones are becoming the storehouses of our digital lives, containing an increasing share of our personal and professional resources and data. Over the last year, mobile phones have become increasingly more powerful and adapted to multiple uses; virtually every phone now sold includes some multimedia functionality, as well as instant messaging, web browsing, and email. QWERTY keypads are common, and geolocation and the capability to record video and audio are quickly becoming a standard features as well. With over 225 million mobile phones manufactured each year worldwide, innovation in these devices is occurring at an unprecedented pace.

At the same time, more and more kinds of content is available for phones. Websites can automatically detect if the browser is housed on a phone and format content accordingly. Video is a click away on almost all new phones, whether you want it streamed to you via the network, played off your SD card, or want to capture it via your phone's internal video camera—and it is hard to find a phone anymore that does not include a still camera with increasingly better megapixel resolution.

Photos, email, music, and other personal files already accompany many of us wherever we take our laptops. The newest form of this trend no longer requires the laptop—your phone is your personal digital repository. High speed broadband, combined with the multifunctionality of new phones and increased storage capacity via removable memory, is making rich media and live content the next big application for phones. Not only will you pull out your phone to show the latest wallet photo of your children—you will be able to show a clip of them speaking at their graduation ceremony as well. Hundreds of your favorite MP3s, on-demand video, navigational assistance, restaurant recommendations, your photos — even language lessons — are all just a thumb click away.

Relevance for Teaching, Learning & Creative Expression

- The increasing capability of phones, plus the fact that virtually everyone has one, is already making these devices an attractive delivery platform.
- The ability of phones to record data has tremendous applications in fieldwork.
- The ability of almost all phones to access email, instant messaging, the web, and calendaring increases the ways in which students and instructors can communicate—and is eroding the digital divide.

Examples

- 20 Ideas for Using Mobile Phones in Teaching & Learning:
<http://teaching.mrbelshaw.co.uk/index.php/2006/09/21/20-ideas-getting-students-to-use-their-mobile-phones-as-learning-tools/>
- Universities use *Rave Wireless* to offer bus schedules, safety information, and other services for students: http://www.ravewireless.com/prod_academic.htm
- Citizen Journalism – using mobile devices to capture and upload news items as they happen: http://www.pbs.org/mediashift/2006/07/digging_deeperstanford_fellow.html

For Further Reading

Going to the MALL: Mobile Assisted Language Learning

(*Language Learning & Technology*, Vol. 10, No. 1, January 2006, pp. 9-16) Describes ways various mobile devices are used in foreign language study. <http://lt.msu.edu/vol10num1/emerging/default.html>

3G: Not a Failure

(*Wireless Week*, Nov. 1, 2006. By Rhonda Wickham, Editor-in-Chief.) Describes the current state of the 3G network and where it is headed. <http://www.wirelessweek.com/article/CA6387872.html>

Time-to-Adoption: Two to Three Years

The New Video Is Smaller Than You Think

The era of small video is here. Video is becoming the communication medium of choice, especially among young people, and as the video shrinks in both program length and physical size, the way we think about video is changing significantly. An audience watching a 3-minute piece on a small screen does not have the same expectations with regard to lighting, camera motion, resolution, and so on as an audience watching a full-length picture in a theater. The 100 million examples on *YouTube* and the nearly 1 million at *Ourmedia* are, for the most part, not cinema-quality, but the sheer numbers of viewers indicate that creating and sharing short videos is a popular activity.

The new video is a different genre altogether—or perhaps a set of new genres. We are seeing new video-based art forms emerge, like machinima, which bridges virtual worlds, gaming, and video production; digital storytelling; video blogs; nonlinear narratives; and video mashups, to name just a few. The mass amateurization of video production has resulted in a new kind of video where the message is much more important than the form.

One of the factors in the rise of personal video creation is that access and distribution are easier than ever before. Not only is it easy to obtain a device that will record digital video, it is also trivial to post videos to any of the many websites designed for the purpose. The author does not need to convert the video to any particular format or have a webserver. Editing is easier too—tools are inexpensive and not difficult to use; digital cameras and cell phones are capable of shooting video.

Relevance for Teaching, Learning & Creative Expression

- For film studies, the new distribution channels mean more student work can be seen and evaluated; folksonomic ranking systems provide a measure of interest if not quality.
- Short movies, mashups, machinima, or music videos are emerging as a medium of expression that can add creativity and imagination—and insight—to an assignment.

Examples

- *Ourmedia* houses user-created video content categorized by type: www.ourmedia.org
- *YouTube College* hosts educational (and social) videos for college students: http://www.youtube.com/school_main
- *TagLoops* allows users to remix online media into web movies: www.tagloops.com

For Further Reading

The Value of E-Learning with YouTube: Video Sharing for Education

(Sabah Karimi, Oct. 2, 2006, *Associated Content*) This opinion piece describes some educational uses of *YouTube* and where it might be headed.

http://www.associatedcontent.com/article/65889/the_value_of_elearning_with_youtube.html

Educational Uses of Digital Storytelling

(Bernard Robin, University of Houston, retrieved Nov. 15, 2006) This website contains suggestions and examples for using digital storytelling in higher education.

<http://www.coe.uh.edu/digital-storytelling/>

Time-to-Adoption: Two to Three Years

Virtual Worlds, Real Opportunity

Virtual worlds are richly immersive and highly scalable 3D environments, often supported by a grid-based network. People enter these worlds as an avatar, their representation in that space, moving their avatar through the space as if they were physically walking — or in some cases, flying. The most popular virtual worlds are multi-user spaces, meaning that many people can be in the same virtual space and interact with one another in real time. While many popular games take place in virtual worlds, virtual worlds are not themselves games. Pure virtual worlds like *Second Life* can be applied to any context, as opposed to game worlds, which generally have a fixed, goal-oriented purpose.

Virtual worlds offer an opportunity for people to interact in a way that conveys a sense of presence lacking in other media. These spaces can be huge, in terms of the number of people that use them, and they are growing in popularity because they combine many of the elements that make Web 2.0 really exciting: social networking; the ability to share rich media seamlessly; the ability to connect with friends; a feeling of presence; and a connection to community.

The use of virtual worlds in education has grown considerably over the past year. Courses now meet in *Second Life* and other locations. These spaces are used for training emergency response personnel, developing civic participation and leadership skills, visualizing real time weather data, modeling complex mathematical functions, and experimenting with architectural models. A consortium of librarians has built an extensive and growing set of information resources in *Second Life*. Courses from English to chemistry hold meetings in virtual worlds, making use of their flexibility and powerful building tools to stage dramas and create realistic 3D molecular models. Also on the horizon are open-source versions of virtual worlds like *Croquet*, *Uni-Verse*, *Multiverse*, and others.

Relevance for Teaching, Learning & Creative Expression

- The generalizability of virtual worlds makes them applicable to almost all disciplines.
- 3D construction tools allow easy visualization of physical objects and materials, even those normally occurring at cosmic or nano scales.
- The social aspects of virtual worlds lend themselves to role playing and scenario building
- New art forms are emerging in these spaces that take advantage of the unique possibilities for expression available in them.

Examples

- A communications class uses *Neverwinter Nights* to create simulations:
http://www1.umn.edu/umnnews/Feature_Stories/22Neverwinter_Nights22_in_the_classroom.html
- At Bradley University, a professor uses *Second Life* for field research:
<http://www.nmc.org/sl/2006/07/19/preparing/>

For Further Reading

Real Learning in a Virtual World

(Gregory M. Lamb, *The Christian Science Monitor*, October 5, 2006) This article describes ways *Second Life* is used in college courses.

<http://www.csmonitor.com/2006/1005/p13s02-legn.html>

Right-click to Learn

(Kate Cohen, *The Phoenix*, August 17, 2006) Educators plan activities in *Second Life*.

<http://thephoenix.com/Article.aspx?id=20561&page=1>

Time-to-Adoption: Two to Three Years

Mapping Goes Mainstream: It's Not What You Know, It's Where You Know

Our notion of maps has changed. An interesting convergence of technologies is bringing maps and data together in ways that are transforming our understanding of history, geography, societal and political change, and more. This set of technologies includes geolocation, the real-world location of a device connected to the Internet; geotagging, the practice of adding geographical metadata (latitude, longitude, altitude, and/or placenames) to images, websites, or other media; geographic information systems (GIS), which store and analyze vast amounts of geographically-referenced information; and data visualization. Maps are no longer static, flat things; they are dynamic, interactive tools that allow us to look at data from a geographical perspective.

Although the technologies themselves are not especially new, it is only recently that the opportunity to use and explore them has been made available to anyone with an Internet connection and a web browser. Previously, use of these systems required expensive software and specialized systems, but new applications have popularized location-based technologies and brought them into the mainstream. Geotagging lets us annotate maps with notes about our own experiences and memories of a place. Geolocation tools have become so ubiquitous that we are not even aware of them; we simply expect our cell phones to be able to direct us to nearby restaurants, to know what time zone we are in, and even to tell us if we have any friends or colleagues in the area. GPS enabled location devices are becoming standard features for navigation in our automobiles..

The emerging promise of these tools lies in the ability to connect them with real data. The application programming interface (API) of tools like *Google Maps* and *Yahoo Maps* allows other software programs to feed data to them, enabling customized information to be displayed on a map; for example, combining crime data and maps, or weather data and maps, allows users to visualize statistical data or data over time. Services like *Mapbuilder* take this process one step further, removing the need for software development skills and allowing users to plot their own data on maps via an easy-to-use web interface with no programming required. *Mobile GMaps*, a free service distributed under a Creative Commons license, brings searchable maps and satellite imagery to your cell phone.

Relevance for Teaching, Learning & Creative Expression

- Create and annotate maps of trade routes, troop movements, or other historical events.
- Map the progress of epidemics over time, combining statistical data with maps to show movement in space as well as time.
- Geo-tag photos taken during fieldwork and link them to maps of the area.

Examples

- *Plazes* detects where you are and connects you to people and places nearby: www.plazes.com
- *Wikimapia* allows you to tag your favorite places and see almost any location from above via satellite imagery: www.wikimapia.org
- *Mobile GMaps* puts it all on your cell phone: www.mgmaps.com/
- Build your own maps with your data at *MapBuilder*: www.mapbuilder.net

For Further Reading

Working with Google Maps

(*Rik Lomas, .net magazine, October 10, 2006*) Technical discussion of using *Google Maps'* API to create an AJAX resource on your website with your data.

<http://www.netmag.co.uk/zine/ajax/working-with-google-maps>

Time-to-Adoption: Four to Five Years

New Scholarship and Emerging Forms of Publication

The time-honored activities of academic research and scholarly activity have benefited from the explosion of access to research materials and the ability to collaborate at a distance. At the same time, the processes of research, review, publication, and tenure are challenged by the same trends. The proliferation of audience-generated content combined with open-access content models is changing the way we think about scholarship and publication.

The new scholarship is still developing, and it is not yet clear what it will look like. Emerging forms of the book, including prepublication research and drafts shared online, the incorporation of data visualization tools into online publications, all forms of customized publishing, and the e-book, are ironically causing us to regard the traditional book as an impermanent medium. Obviously, books themselves are a very permanent form of communication; but the content of printed matter is perceived as increasingly impermanent, and is more and more often accompanied by a website, wiki, or other online resource that can communicate new insights as they arise and create and sustain a living community around the concepts entombed in the published material.

Further along this road we may see open-source textbooks, electronic books (imagine all those heavy freshman readers contained in a single tablet the size of a slim notebook!), online textbooks, and other forms of publication that take advantage of the flexible and updateable nature of electronic media. The real potential of this trend, though, is to expand access to scholarship and new ideas.

Relevance for Teaching, Learning & Creative Expression

- link original texts with others that explain or expand on allusions in the text
- collaborate on scholarly publications with a much wider audience, including young people, the public, and experts from related disciplines
- combine online conversations with more traditional types of scholarly research

Examples

- The Institute for the Future of the Book is keeping an eye on these trends: www.futureofthebook.org
- Edit a collection of free content textbooks at Wikibooks: en.wikibooks.org/wiki/Main_Page
- N I N E S is a consortium of scholars promoting and exploring new forms of scholarship: www.nines.org/index.html
- Using Wiki in Education is a book and wiki edited by Stewart Mader: www.wikiineducation.com/display/ikiw/Home
- Public Library of Science is committed to making the world's scientific and medical literature a freely available public resource: www.plos.org

For Further Reading

Book 2.0

(Jeffrey R. Young, *The Chronicle of Higher Education*, July 28, 2006). Scholars turn monographs into digital conversations. chronicle.com/free/v52/i47/47a02001.htm

The Future of Books

(Jason Epstein, *Technology Review*, January 2005). This article reviews the writer's experiences in the world of traditional publishing and looks ahead to the future of publishing. <http://www.technologyreview.com/InfoTech/14064/>

Time-to-Adoption: Four to Five Years

Massively Multiplayer Educational Gaming

The interest and trend of educational gaming has accelerated considerably in the last year. Discussion and research has continued, identifying games that are goal-oriented and those that are more social in nature; games that are easy to construct and play, and those that are more complex and time-consuming; and games developed expressly for education versus commercial games that are appropriated for educational use. We see the topic twice in this report, with virtual worlds recognized as a category in its own right. Virtual worlds are inherently more generalizable than the things we traditionally include in the category of “games,” and that category is clearly moving faster than many of the various aspects of pure gaming, especially massively multiplayer games.

Massively multiplayer online (MMO) educational gaming differs from virtual worlds in several ways, but the most significant is that MMOs are typically very goal-oriented and thus less generalizable. Even setting aside issues of cost, creating a compelling MMO is a challenging enterprise because of the complexity involved in developing a really engaging game of this genre. As a result, although interest remains high and experimentation and research continue, this category of games lags other forms of educational gaming. This is not to say that gaming in education hasn't arrived, however. Educational games of other types have continued to grow in popularity and are increasingly used in teaching and learning today. Cost will become less of a factor as open-source MMO gaming engines are further developed, and within a few years it is likely that educational MMO games will be commonplace in a variety of disciplines.

Relevance for Teaching, Learning & Creative Expression

- Games are engaging and their value for learning has been established through research.
- Increasingly, we know more about how games work and how to apply them to teaching and learning.
- Games offer opportunities for both discovery-based and goal-oriented learning, and can be very effective ways to develop team-building skills.

Examples

- *Thinking Worlds* is an educational games authoring engine and a community of user-developers; games can be shared within the community: www.thinkingworlds.com/
- A professor at Indiana University has received a grant from the MacArthur Foundation to develop an MMO about the life of Shakespeare: newsinfo.iu.edu/news/page/normal/3599.html
- Indiana University is investigating the potential of MMOs in a big way: swi.indiana.edu/

For Further Reading

Digital Game-Based Learning: It's Not Just the Digital Natives Who Are Restless

(Richard Van Eck, *EDUCAUSE Review*, vol. 41, no. 2, March/April 2006: 16–30). This article discusses why digital game-based learning is effective and engaging and outlines educational applications.

www.educause.edu/apps/er/erm06/erm0620.asp

Massively multiplayer online games (MMOs) in the new media classroom

(Aaron Delwiche, *Educational Technology & Society*, 9 (3), 2006: 160–172). This paper reports findings from two MMO-based courses in the context of situated learning theory.

www.ifets.info/journals/9_3/14.pdf

Time-to-Adoption: Four to Five Years

Personal Learning Environments

Personal Learning Environments (PLEs) are very much a concept than a reality, and there is not a great deal of agreement on what a PLE is. Much of the discussion and development of PLEs has taken place on blogs. Personal learning environments are described as systems for enabling self-directed and group-based learning, designed around each user's goals, with great capacity for flexibility and customization. PLEs are conceived as drawing on a variety of discrete tools, perhaps chosen by the learner, which can be connected or used in concert in a transparent way.

Some elements that might be found in a PLE are already in place; for example, conceptual diagrams suggest that social networking tools such as tagging, blogs, iTunes, wikis, del.icio.us, and others should be part of a PLE. While the concept of PLEs is still very new and fluid, it does seem to be clear that a PLE is not simply a technology but an approach or process which will differ from person to person. It involves sociological and philosophical considerations and cannot be packaged, passed out and handed around as a cell phone or tablet computer could. Widespread adoption of PLEs, once they actually exist, may require a shift in attitudes toward technology, teaching, and learning.

Bona fide examples could not be found, as PLEs are still highly conceptual and if they have found their way into classrooms, the documentation of those efforts is still forthcoming. One challenge to the adoption of this approach is that a PLE is by its very nature different for each individual. Adoption represents a major change to the traditional group-based practice of instruction. Other identified challenges include coordination and administration of different PLEs within one institution, becoming part of existing e-learning domains, persuading teachers and students to use PLEs, and integrating other factors, many social and personal in nature, into the formal learning process.

Relevance for Teaching, Learning & Creative Expression

- PLEs may enable visual learners to obtain material from a different source than auditory learners do.
- Students' "play" on the web or with other new media may become something they can integrate into their learning, and they may similarly be able to integrate learning into play.
- Creative and scholarly works may become more unique as the writers/researchers/artists integrate their own individuality more and push against conventional limits on what constitutes knowledge and expression.

For Further Reading

The Personal Learning Environment: A Report on the CETIS PLE Project

(Mark Johnson et al., August, 2006). This report is a comprehensive discussion of PLEs. Topics covered include implementation of technologies, transformations of pedagogies, and different ways of learning.

wiki.cetis.ac.uk/uploads/5/57/PLE_report_Final4.doc

Personal Learning Environments. A wiki on the subject, maintained by Mark van Harmelen. It includes numerous links to other papers and discussion of different kinds of PLEs, including blogs and e-portfolios.

octette.cs.man.ac.uk/jitt/index.php/Personal_Learning_Environments

Personal Learning Environments: Challenging the dominant design of educational systems.

(Scott Wilson, et al. Undated).

An academic paper with discussion of issues that pertain to the design of a PLE. Its focus is on the technological side and what the needs in that area are, rather than on pedagogical or social practices.

dspace.ou.nl/bitstream/1820/727/1/sw_ectel.pdf

Time-to-Adoption: Four to Five Years

Internet-Wide User-Centric Identity Systems

A user-centric identity system is, in the simplest terms, a way of creating a single digital identity that can be used in any place where a log-in is needed. At the same time, it is not perceived simply as a technology; it is also characterized as being about relationships and services. A variety of different systems are being developed, and though they have the same broad purpose of creating a sign-on system that is convenient and secure for an individual rather than a company or organization, ideas about what precisely defines a user-centric identity system and how that would be implemented are still widely varied.

Internet-wide user-centric identity systems are still their infancy, but the ideas behind them are clearly gaining momentum. Several different approaches to such identity systems have already been developed. These early efforts are all essentially still prototypes rather than systems which could be widely used, but the potential for systems is such that Google has gotten involved with its own system, *GoogleAuth*, which will likely generate interest people outside the field of computer security. While identity systems focus on people as consumers rather than as learners or teachers, a widely distributed identity system could have interesting academic applications, especially insofar as information is a retrievable product.

Relevance for Teaching, Learning & Creative Expression

It is still too early to articulate real examples for teaching and learning, but some hypothetical situations can be postulated:

- The login once, access anywhere nature would allow students to borrow resources directly from other libraries, rather than going through interlibrary loan.
- Subscriptions to online journals would be managed and access would be seamless, without needing a login each time.

Examples

- *Sxip* (pronounced \skip\) Identity is developing identity systems: www.sxip.com
- *OpenID* is an open framework for user-centric digital identity: openid.net
- *GoogleAuth* is Google's system under development: code.google.com/apis/accounts/AuthForWebApps.html

For Further Reading

Before we can have user-centric identity in the enterprise...

(*Nishant Kaushik, July 1, 2006*). This blog entry discusses issues that might need to be resolved before reaching a consensus on what user-centric identity is. blogs.oracle.com/identitycorner/2006/07/17

The Laws of Identity

(*Kim Cameron, May 2005*). This paper discusses the technical and social issues that accompany the development of a user-centric system, as well as giving examples of what happens when the laws are broken. www.identityblog.com/?page_id=352

SocialPhysics.org

(*Retrieved November 14, 2006*). The goal of SocialPhysics is to give people more control over their digital identities: their online identities, personal information and social relationships. <http://socialphysics.org/>