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WEB 2.0

TODAY'S TECHNOLOGIES, TOMORROW'S LEARNING

Facebook, Second Life, World of Warcraft. Any of these sound familiar? Ever use any of them? If not, don't feel bad, there are lots of us who don't. But if you're under the age of 18, there are many who do. These are just a few examples of the leading technological innovations of today. *Social networking* sites such as Facebook offer users the ability to connect with friends, meet new people, and join groups around topics of their interest. *Simulations* such as Second Life are enormously popular, affording the user the opportunity to move within a digital space to explore new ideas and try tasks that they would otherwise not have the opportunity to do in the real world. *Digital games* such as World of Warcraft (WoW) provide scaffolded worlds where players must work together, striving to accomplish increasingly difficult tasks, in order to excel.

When it comes to technologies like digital games, simulations, and social networking, teachers and students can quickly find themselves at cross purposes. Often, students find that these technologies, so prevalent in their lives outside of school, are unwelcome in their classrooms. Many teachers can tell stories about the disruptive influence of video games and social networks on their classrooms and schools. As researchers at MIT's Education Arcade, we have dedicated ourselves to understanding the potential benefits of these technologies to teachers and students and to helping schools implement these technologies in ways that make sense. We're not alone, either—there are a number of organizations around the country and in the rest of the world attempting to make games and procedures that can help bridge the gap between the traditional scholastic culture and the culture of today's learners. While countless talented teachers have been cultivating profound learning in students without these technologies, educators are also in a perpetual quest to find the best tool for a specific learning task.

With digital games, students get to experience the concepts versus watching a video on it.

While the aforementioned applications might not immediately seem like ideal tools for the classroom, they are tools, that, when used properly, can provide tremendous value to students and teachers.

Who and What Do You Know?

Educators, researchers, and designers are just beginning to explore the educational benefits of social networking technologies. By connecting students and teachers, they can create strong communities of practice, essential aids to good teaching and learning. Social networking technologies help teachers and students extend their learning into an additional space, a space for communicating, collaborating, sharing ideas, and sharing learning. This space is always available to the student and the teacher—even outside the classroom walls. Networking tools such as Ning allow you to create a private social network for your classroom easily. Once you've made your own Ning community, you can set up and manage accounts for students, and record and communicate class assignments and other communication. Your students can extend their class discussions in the forum and share relevant resources they've unearthed on a research project. It's also easy for teachers to create communities for themselves to share best practices, curricula, and more.

Forest Fires in Class!

Hands-on, real-world learning experiences are the ideal way for students to learn anything. Often though, doing an activity hands-on, in the real world, is not an option in the classroom—there are constraints such as time, accessibility, and resources. In the case of exploring the human circulatory system, say, it's not even an option. This is where simulations—analogies of real-world situations—can play a critical role in effective learning. There are many ways to simulate complex systems, but by leveraging the computing power of digital simulations, students can have experiences that get at concepts and knowledge related to your classroom content.

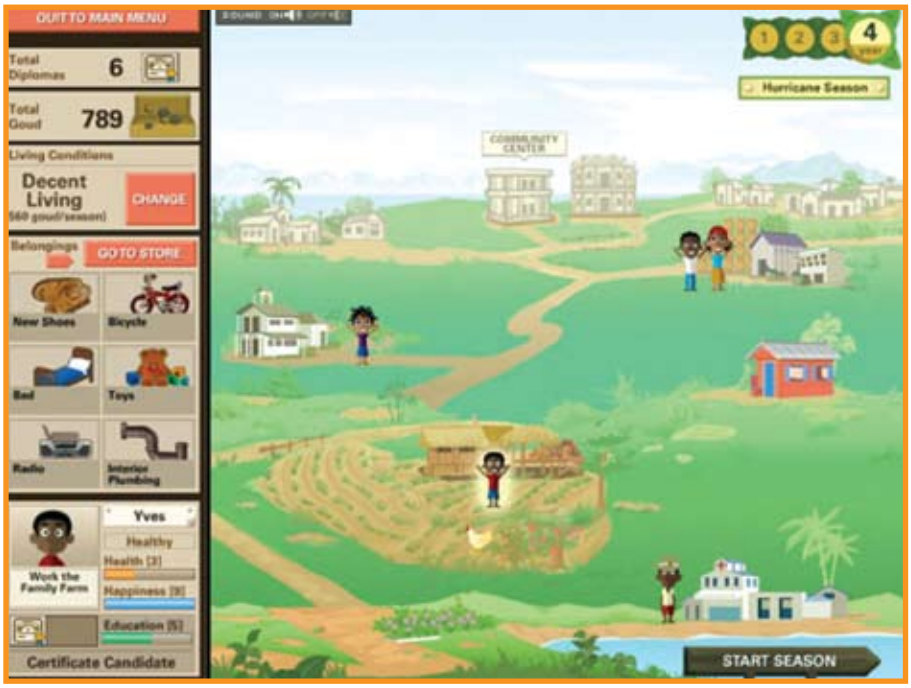
Hal Scheintaub, a middle school science teacher in Lawrence, Massachusetts, has been using Starlogo: The Next Generation (Starlogo TNG) for

Social networks, simulations, and digital gaming are bridging the

An aerial view (above) and the agent view from Starlogo TNG's Forest Fire Simulation.

gap between traditional scholastic culture and today's learners

around eight years in his classes. This free and robust program, developed by the MIT Scheller Teacher Education Program, allows students to create simulations and games with easy-to-use programming blocks. With Starlogo TNG, Scheintaub can demonstrate the principles of evolution or the factors in a forest fire—two concepts that would otherwise be difficult for the students to experience. "It's different from the science test I just gave," he says, because it allows him to pose more interesting questions and to allow students to generate multiple correct answers instead of looking for one "correct" answer.



Ayiti: The Cost of Life focuses on the issue of poverty as an obstacle to education and uses the country of Haiti as a case study.

More Than Child's Play

While Jeopardy may be a classroom favorite, the games we're referring to are much more complex, and have an interface familiar to almost any student today. In the book *Augmented Learning: Research and Design of Mobile Educational Games,* author Eric Klopfer defines games as "purposeful, goal-oriented, rule-based activity that the players perceive as fun." In the book *What Video Games Have to Teach Us About Learning and Literacy*, James Gee explains, "good games… are crafted in ways that encourage and facilitate active and critical learning and thinking." In the classroom, games can motivate students to work toward a goal, and cultivate collaborative problem-solving skills as well as "telescope" skills (the ability to determine objectives and prioritize them). They demand numerous other thinking skills such as weighing evidence, analyzing situations, and decision-making. The highly acclaimed digital game Ayiti: The Cost of Life, developed by GameLab and GlobalKids, is a great example of how a digital game fosters these skills. In Ayiti, players are introduced to a family on the island of Ayiti, and must help them make decisions about work, education, community building, personal purchases, and health care that might improve their lives. Of course, just as in real life, resources for this family are not limitless, and the optimal option for each family member may not be feasible when considering the goals and needs of the others. Students must discuss costs and benefits of their decisions, as well as the motivations for their choices. Muzzy Lane's Making History is a more complex game targeted at older students, where students role-play to take on significant challenges (diplomatic, economic, military, etc.) facing world leaders in the WWII era.

Perhaps most important, games set the stage for critical, experiential learning. Ross Fitzgerald, a seventh-grade central subject teacher at Shady Hill School in Cambridge, Massachusetts, has been using commercial, content-related games such as Diplomacy in his classroom for several years. Although Fitzgerald believes the ideal scenario is to partner up students on one computer, he also played games as a class, with the game projected at the front of the class. For Fitzgerald, the benefit of the game is the framing of the content as the students explore and interact with the scenario at hand (such as the political causes of WWI as found in Diplomacy). Yet Fitzgerald believes that the most critical product of playing these games is the conceptual knowledge of the experiences; in Diplomacy, students learn about the political causes of WWI, but students also learn to negotiate and be mindful of how their actions impact others (systems thinking). "The conceptual knowledge is critical because if you can grasp that, then you can transfer skills and morph into other domains, roles, and work more easily," explains Fitzgerald. "With digital games, students get to experience the concepts versus watching a video on it."

Bumps in the Road

As with many innovations and technologies, social networks, simulations, and digital games can be difficult to implement in the classroom. For instance, these tools require access to the technologies that support them. In the case of simulations and digital games, this can mean more powerful computers—but not always. In the last several years, this has become less and less of an issue, as many schools are purchasing computers that can easily handle these applications.

With anything new, there can also be a steep learning curve. The same will be true as you explore these tech-

Pick a technology that interests you, and play with it. Try it out with a colleague, and find a support person or Web site to help you in your endeavor. There will undoubtedly be bumps in the road, but technology's ability to engage your students and amplify learning in new ways just might have you saying, "Wow!"

nologies and take chances in implementing them. Some things will take off and will allow your students to soar; others will prove less worthy of classroom time, as Fitzgerald discovered when he attempted to use another digital game that proved to be too complex for his students. Being mindful of the likelihood of bumps in the road can help minimize problems as you experiment with these new technologies in the classroom. Fitzgerald says, "Sure it's tech stuff, but just be willing to tinker! It's like any tool, just a little more complex."

Also, bringing something into the classroom that is open-ended and not teacher-directed comes with problems. Not knowing exactly what's going to happen is an unsettling feeling for most educators. Without clear outcomes that can be anticipated, the facilitation of learning experiences around these tools will be challenging the first time you try it. Classrooms successfully using social networking, digital games, and simulations are student-centered, and require the teacher to support the learning that will unfold through student interaction with the tool. However, Scheintaub explains, "This is the best situation, because you and the kids become partners in learning." When something goes wrong, or the students run into something they don't know how to do, Scheintaub and his students seek other ways to solve the problem together—a great way to model and practice problem-solving with students. Similarly, digital games are also very open-ended and can lead to various outcomes in the classroom. Fitzgerald explains that running games such as Diplomacy can raise tensions among students as they learn to negotiate as diplomats. Although these tensions may be a bit unsettling at first, they are an excellent way for students to develop real skills that tie to the classroom content.

Strategies for Success

So why give these technologies a try? According to Fitzgerald and Scheintaub, it all comes down to student learning. When Fitzgerald's classroom engages with a digital game, "students gain deeper conceptual knowledge, and they understand the content better." Student scores on his classroom tests have improved since using digital games in instruction. Scheintaub echoes Fitzgerald's sentiments, adding that these technologies are highly engaging. "By bringing school into the modern era, they like it and relate to it."

With value like that, we believe these technologies are worth taking some risks in the classroom. Here are some tips to get started:

Explore. Spend time just playing with these technologies. Try surfing Ning to see how other schools are using it, or start a Facebook account. Club Penguin is a popular simulation/social network for elementary students. A number of simulations are available in almost every field of science. One popular site is Explore Science (subscription required).

Partner with a colleague. Try new technologies together, or share notes of things you've found independently. It's a great way to bounce ideas off of someone and learn from their successes and challenges. Can't find anyone at your school? Attend a session at a conference about the technologies you're interested in, or search the Internet for teachers who use them. Building relationships with other educators is a great way to build a support network, and today's technologies make it easy to communicate with colleagues near and far.

Find additional supports. Express your interest to the Academic Technologist at your school. They'll likely be able to put you in touch with several resources to support your work. Many resources exist via the Web; for example, Starlogo TNG has a listserv where members are educators just like Hal Sheintaub who have questions and insights about using this tool in the classroom.

There's still much we need to learn about how social networks, simulations, and digital gaming can improve learning, but they are proving valuable in classrooms such as Scheintaub's and Fitzgerald's. Pick a technology that interests you, and play with it. Try it out with a colleague, and find a support person or Web site to help you in your endeavor. There will undoubtedly be bumps in the road, but technology's ability to engage your students and amplify learning in new ways just might have you saying, "Wow!"

Resources

Club Penguin: http://www.clubpenguin.com
Cost of Life: http://www.costoflife.org
Explore Science: http://explorescience.com
Facebook: http://www.facebook.com
Ning: http://www.ning.com
Starlogo: http://education.mit.edu/starlogo-tng/

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