

# How Simulations, Games, Virtual Worlds, and Web 2.0 are Revolutionizing Education and Training

BY MATHEW GEORGHIOU

There is a quiet revolution happening in education and training around the world. Simulations, games, virtual worlds, and Web 2.0 are quickly changing perceptions of how we can and do learn. Some even anticipate that they will change learning more in the next 10 years than anything has since the invention of the printing press.

This revolutionary change has the potential to impact formal and casual learning at all levels of society, from public education, home learning, corporate training, military and combat readiness, to economic development and nation-building.

Read on to learn more about these drivers of change and how they can be harnessed for individual and organizational success.

## A brief history of learning

It can be imagined that hundreds of years ago, most learning was experiential. If you wanted to learn something, you did it. You did not read about it or sit in a classroom for hours, days, or weeks to prepare for doing the task. We learned by doing.

Things changed. Perhaps it was the industrial revolution and a couple of world wars that created and engrained the common classroom-based, cookie-cutter model. A model which is still predominant today. Interestingly, despite our technological and intellectual progress, it might be said that the classroom is one of the few places in world where you can have the same experience today as that of 20, 50, or more years earlier. Established processes, lack of new research, strong labour unions, and other forces kept us on this unwavering path of books, courses, and seminars for learning.

Then came the 1990's. We saw the emergence of the multimedia computer, and subsequently, the introduction of educational products that included graphics, animation, audio, video, and some interactivity, often delivered on CD-ROM. This new capability expanded the opportunities for anywhere, anytime learning; and, to some extent, the quality of the learning experience.

In the late 1990's, the Internet took hold. Almost instantly, many companies adopted e-learning courses in droves. They benefited from tangible cost savings by the reduction of travel. And, courses could be offered to all job families, offering wider access to all employees. But, it seems, little regard was given to the quality of the learning experience. Arguably, even though e-learning offered tangible benefits, poor course design diminished quality. The result was (and likely still is) poor participation rates, and even poorer completion rates.

The early 2000's saw the introduction of blended learning. An acknowledgement that effective learning may require integration of both online and offline methodologies. Quality improved, but so did cost.

The result of these two decades of progress is that technological advancements have significantly improved anywhere and anytime learning. But, more importantly, and to the disappointment of many, they have only marginally improved the effectiveness of learning. Arguably, this is because training continues to be built upon an old paradigm of learning that simply does not work well. And we cannot have better learning experiences until our thinking about learning changes.

The good news is that today we are in the era of Simulations, Games, Virtual Worlds, and Web 2.0. New methodologies that have the ability to change how we think about learning – and as importantly, how learning experiences are designed and delivered.

## Web 2.0

Web 2.0 refers to how the Internet can now be used for much more than static, one-way communication. Web 2.0 applications are those that enable social networking, business networking, media sharing, blogging, podcasting, and more.

Whether we realize it or not, there is a lot of informal learning happening in these environments. This includes: Countless instructional videos on YouTube; Project collaboration on Yahoo! Groups or Google Docs; Expert opinions, tips, hints, very good (and terribly bad) advice that can be found on Blogs; Business questions that can be posted on LinkedIn; and, personal mentoring and advice sharing that happens on Facebook.

Web 2.0 applications can be used to deliver, support, and expand learning in many ways. An additional benefit is that many of these technologies can be used for free, and often without requiring approvals or integration within corporate infrastructure, making adoption fast and easy.

## Games and Simulations

Many industry researchers and analysts are bullish on the potential of games and simulations. In 2006, Gartner reported that, “A quiet revolution has been occurring inside leading enterprises worldwide. For mission-critical jobs (high skill or high turnover), simulation-based learning has become a standard part of an enterprise's operating model and a competitive differentiator.”

Beyond corporate training, the US National Education Association has said, “The potential [of video games for education] is enormous.” And, the Federation of American Scientists declared that, “Video games can reshape education. [It's the] next great discovery, a way to captivate students so much they will spend hours learning on their own.”

Games and simulations can take various different forms, and the terms are often used loosely (lending to one of the challenges of understanding their usefulness). At the risk of over-simplifying the options, let's consider some examples. “Drill and Repeat” games can be used for rote learning and to reinforce concepts. For example, Cisco Systems found that its certified network engineers around the world would be more effective at their jobs if they were able to master binary math – converting between Base 10 numbers and Binary 1s and 0s. Binary math is easy, but doing fast conversions requires lots of practice. As a solution, Cisco developed the Binary Game and made it available for free on its website and for use on mobile devices. This simple but effective drill and repeat game not only solved a key

training challenge, but it also turned out to be an effective corporate marketing tool used at various events, with prizes awarded to top scorers. This same type of approach can be used to improve learning about investment concepts, accounting terms, management techniques, and more.

Beyond simple drill and repeat, games and simulations can also be used to provide deep experiential learning. These types of experiences are ideal for imparting concepts that have complex inter-relationships, decision-making with incomplete knowledge, and risk — all in real time. Similar to popular video games, a learner can be immersed in highly visual and interactive environments in such rewarding ways that she feels both intellectually and emotionally engaged in the experience — as if she was living it.

For example, budding entrepreneurs can learn what their business and personal lives might be like by playing a business simulation that recreates the day-to-day experiences of being an entrepreneur. The same simulation can be used as a customer empathy tool by employees of a company that services entrepreneurs. Sales people can learn how to use a simulated product without actually having the real product at their disposal, and they can internalize a sales process by practicing with simulated customers. Employees can learn how to use a software program or complete an expense form through a tutorial that simulates the tasks. Customer service agents can participate in simulated role-playing exercises. And, simulations can be used to forecast future events based on historical data and intelligent formulas.

IBM recently launched INNOV8, a Business Process Management Simulation, which it donates to educational institutions to better prepare students for the workforce. IBM's game puts you in a 3D world inside a virtual company, interacting with other characters to accomplish specific on-the-job objectives.

Games and simulations can be used for more than just training. French cosmetics giant, L'Oreal uses an online business simulation as both a marketing and recruiting tool. Players take on the role of a general manager of a fictitious cosmetics company and compete for high profits. As of 2006, L'Oreal already hired 186 top players from 28 countries.

Finally, imagine a simulation of your entire company, where every employee can be the CEO. Consider the potential improvements to employee performance and loyalty when everyone is able to experience the entire company and the importance of their own roles within it.

Nearly any task, procedure, process or skill can be simulated. And, it is likely that most things will. But, not everything should. Designing a custom game or simulation is much more difficult and expensive than conventional training experiences. But, if designed properly, the investment has the potential to be much more profitable — both in terms of changing behaviours and the ability to use the same program for much more than training.

Adopting an off-the-shelf game or simulation is often the ideal first step. But, the plethora of conventional games and simulations available today are primarily designed for entertainment purposes. They are often difficult to install, difficult to use, and focus on questionable objectives, making them generally unsuitable for education. However, the number of off-the-shelf and customizable educational games and simulations are increasing quickly.

Start by identifying the primary learning outcomes desired and then match that to a game or simulation scenario that can deliver those outcomes in an effective and engaging way. There is real art and science at play here, as the game play must support and enhance learning, not get in the way of it. Successful design must properly integrate education, entertainment, gaming, simulation, graphic design, artificial intelligence, and technology. It is not uncommon for companies to have failed attempts adopting a game or simulation because they did not have, or hire, the appropriate breadth of skills.

## Virtual Worlds

The recent success of virtual worlds, sometimes referred to as Massively Multiplayer Online Games (MMOG), has opened up even more creative and powerful training options. In fact, at the 2007 IBM Global Innovation Jam, over 46,000 new ideas and innovations were discussed, with virtual worlds, gaming environments, and 3D Internet voted as one of the top ten, triggering a \$10 million IBM investment in the area.

Virtual worlds often include immersive 3D interfaces, where you take on a character (or “avatar”) that you can sometimes even design to look like you. Using the mouse or keyboard, you move your avatar inside the 3D world, seeing and interacting with life-like or animated objects, and communicating with other human and computer-controlled avatars. Communication is primarily accomplished using text chat and/or voice via computer or telephone.

The two most successful virtual worlds, in terms of number of subscribers and buzz, are World of Warcraft and Second Life. World of Warcraft is a fantasy-based combat game, which, perhaps, can be likened to being a character in a *Lord of the Rings* tale. Along with over 10 million other human beings who are playing the game, you can take on a variety of combat and civilian roles. While a game like World of Warcraft may not have a direct place in the corporate training toolbox, expert observation and research suggests that players in this virtual world gain real business skills. For example, “Guild Masters” lead teams of avatars (controlled by real people) on quests, and to be successful they must use effective management, teamwork, resource planning, communication, and strategy skills.

Second Life is the virtual world that has caught much of the training industry’s attention. Many leading companies and educational institutions are creating presences and conducting real business and training inside the world. Unlike most other virtual worlds, Second Life is not necessarily fantasy or combat-based. It is essentially anything its community wants it to be, because users create all the objects in the world. Nearly anything that is in the real world can be found in Second Life, including buildings, streets, landscapes, cars, airplanes, clothing stores, clubs, casinos, currency exchanges, and much more. You can even get real jobs that pay real money by building objects for others, or even selling your services as, for example, a dancer in a club.

The flexibility and wide adoption of Second Life (over 12 million and growing) has encouraged trainers to host meetings and classes inside the world. On the most basic level, learner avatars sit in a virtual classroom, much as they would in a real one. The benefit is that the visual 3D world provides an enhanced emotional and personal social experience than can be achieved using other types of collaboration tools via a website or learning management system.

Certainly, duplicating the classroom experience virtually is not much of a leap forward. But, that is just scratching the surface. Virtual worlds can enhance all types of collaboration and networking by

providing visualization and personalization where before it was not possible. Similarly, they can enhance live mentoring and support experiences.

Virtual worlds can also bring things to life. IBM and The Palace Museum are building a virtual world of China's Forbidden City, allowing people from anywhere in the world to explore a realistic historical recreation. Similarly, Indiana University is building a virtual world for learning about and directly experiencing Shakespearean content. These virtual worlds may even include computer or human-drive characters to interact with.

Emergency response groups are building training scenarios that immerse people in highly realistic exercises where they must do exactly the same things they would do in the real world. This can involve driving vehicles, operating machinery, coordinating activities, and much more. Unlike the real world, there is no risk or limit to the scenarios that can be created – and it can be done at a fraction of the cost.

In summary, virtual worlds can offer training that is experiential, collaborative, personalized, story driven, and mentored. They are well suited for real time collaboration and physical interaction, particularly in a spatial context. But, because virtual worlds tend to include immersive 3D interfaces, they usually require special technologies, powerful computers, and high speed Internet. And, it is important not to get caught up in the glitz of a 3D interface, as it can inhibit the learning experience. Only use this technology when it adds real value that cannot be delivered otherwise.

## Next Steps

With so many new options available, it can be confusing to figure out where to start. Here are some suggestions. Nearly every technology offers a free trial or subscription level. Start there. There are also numerous video demonstrations available on company websites and on YouTube.

If you are ready to take the plunge, try to find an off-the-shelf solution. It may not perfectly match your needs, but it will be a quicker and less expensive option. If a suitable off-the-shelf solution cannot be found, try a custom solution, but keep it simple to start and build on it later. If budget is an issue, try to consider how the solution may benefit other departments in your company and pool dollars.

Do it right and you may find that learning can indeed become cheaper, faster, better, fun, and even addictive.

*Mathew Georghiou is  
CEO and Chief Simulation Designer of  
MediaSpark Inc, producers of the acclaimed  
GoVenture educational games and simulations.  
[www.mediaspark.com](http://www.mediaspark.com)*