



Serious games provide learning, training

Serious games are designed for learning, training, simulation — and fun

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Updated: 8:29 p.m. ET Nov 2, 2006

ARLINGTON, Va. - On the face of it, "Re-Mission" looks like any other video game. In it, you play Roxxi, a comely "nanobot" with a sassy haircut and a bad-ass cache of weapons.

But the enemies you fight in "Re-Mission" aren't enemies in the traditional game sense. They're leukemia cells and bacteria, mouth sores and mucous sludge. And Roxxi's impressive ammo collection doesn't contain guns or grenades, but chemo rockets, bacto blasters and pain med applicators. In this game, you fight cancer.

"Re-Mission" is part of a small but growing genre of games called "serious games," a broad brush of a term used to describe games tackling real-world issues. Fighting cancer cells is one example. Teaching aspiring activists how to use non-violent methods to resolve conflict is another.

Much maligned in the press for being the source of ills ranging from childhood obesity to school violence, serious game advocates gathered at the Serious Games Summit in Arlington, Va., this week to prove that video games can also be a powerful teaching, training and collaboration tool.

Take, for example, a game built specifically for the forest sciences department at Oregon State University. Three faculty members thought it might be cool to create a "virtual forest," a simulator that would let field ecologists and academic types really "see" the data that they share.

The game, called the GNNViz Project, is sort of like "World of Warcraft." Scientists meet up in the game, scout around and make real-life decisions based on what they see in their simulated forest. In the game, spreadsheets and topographical data are served up as virtual terrain and trees.

And although right now this game is being used only in academia, one of its creators, Tim Holt, has visions of it being used for public education and to train forest firefighters.

"Fighting a fire is dangerous and expensive, and it's not something you get a chance to do very often," he says. "The best place for a simulation is something that's dangerous, expensive or hard to do."

Players of "Tactical Iraqi" likely would agree. Developed by the University of Southern California's Information Sciences Institute and used by the Marines, this game gives soldiers a crash course in Iraqi Arabic. It also teaches them the importance of body language and nonverbal cues when speaking to Iraqis.

Players get a chance to practice their skills in a virtual Iraq before they have to actually enter a war zone. Address two Iraqi men with your head bowed, a sign of respect, and their opinion of you goes up. A thumbs-up sign, which is a positive gesture in our culture, can be viewed as a sign of aggression in the Arab world.

Perfect forum for risky training

Because games are such a perfect forum for risky training, it's not surprising that some of the earliest adopters of game technology were the U.S. government and the military. When Army recruitment numbers hit record lows in the late 1990s, the U.S. Army contracted with the Naval Postgraduate School to create "America's Army," an "advergame" designed to attract recruits. When the Department of Justice wanted to teach potential first responders how to react to a major crisis in a post 9/11 world, they teamed with Breakaway Games to create "Incident Commander."

Breakaway, one of the biggest serious game developers, has built a business on creating games for the government. Their client list reads like a Tom Clancy novel: DARPA, the Department of Justice, the Joint Forces Command. And while Breakaway does make entertainment games too, you won't find most of their titles on the shelves of your local Target.

One of the company's latest ventures, "PULSE!!," is a hospital simulator, an immersive, 3D training environment for doctors and nurses.

"One of the problems in medical education is that there aren't enough facilities," says Doug Whatley, the founder and chief executive of Breakaway. "We need to train people where they are, and deploy training where it's needed."

Shortfalls in the number of nurses needed in the U.S. may accelerate the adoption of "PULSE!!" and other games like it into medical training. And the coming wave of baby-boomer retirees may help convince the corporate sector to buy into game-based training, something it has been slow to do. And most agree that corporate adoption of games is vital to move this still-niche industry into the mainstream.

"General industry and big business is still about a year away," says Whatley. "I think they'll begin to open up budgets, but for now, they're still just dabbling."

'Gamer generation'

Facing a potential brain drain may require radical thinking from conservative companies. A new wave of freshly minted college grads, a demographic that was literally raised on video games, will revolutionize the way workplaces operate, predicts Byron Reeves, a professor at Stanford University and a proponent of game-based learning in the corporate sector.

For this "gamer generation," competition is fun and familiar, trial and error is a learning strategy and risk is understood as being necessary for success.

"The expectations that are being developed in games are the same ones that this generation will bring to work," he adds.

It doesn't hurt that serious games are cost-effective — at least when compared to their entertainment-game cousins. "Incident Commander" cost a mere \$1 million to develop — far less than a "Madden" or a "Final Fantasy." That's mainly because the underlying technology of many serious games is the same technology that powers entertainment games. No need, in other words, to reinvent the wheel.

There's a whole community of gamers in the entertainment space that like to modify existing games with customized content. These so-called "mod-makers" might add new characters, new textures, new levels and even new storylines to a commercial game like "DOOM" or "Half-Life."

Existing — and inexpensive — tech

In some cases, these "mods" create a whole new game on the back of an existing one. Holt and several other modders developed "Day of Defeat," a World War II game, using Valve Software's Half-Life Source engine.

Holt used that same know-how when building his forest simulator, which marries massive amounts of forest data from Oregon, Washington and California with Garage Games' Torque Game Builder, an engine that powers several popular casual games.

"Making a mod can be as easy or as hard as you want it to be," says Holt. A small change, like altering the sounds of gunfire, can be quite easy. A total conversion, as it's called in the mod community, is something else altogether. For that, Holt says, you'll need software development skills, 3D model-editing abilities, and 2D art-creation chops.

But not all of that is necessary in serious games.

"Lightweight changes to a game engine can have a huge impact," says Holt. "Too many people get caught up in trying to make something really realistic, when the truth is, they need to concentrate on whether they can accurately simulate [a specific] environment."

But no matter how cheap, easy-to-make and innovative serious games are, they share one critical must-have with entertainment games: they've gotta be fun. Or at least, fun enough so that the player will not only be entertained — but engaged.

"A serious game needs to keep its feet firmly planted in two worlds," says Nick deKanter, co-founder of Muzzy Lane Software, which makes the World War II strategy game "Making History." "The game must have one foot in the education world, with the right ties into the teaching objectives," he says. "But the other foot is in gameplay."

Good gameplay in a serious game, says W. Lewis Johnson, project lead on "Tactical Iraqi" and the chief executive of Tactical Language Training, is one that's not only engaging, but rewarding. "That is what keeps learners working hard."

In fact, many who've played "Tactical Iraqi" have remarked that they can't wait to play it again, he says.

Ever said that about a textbook?

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