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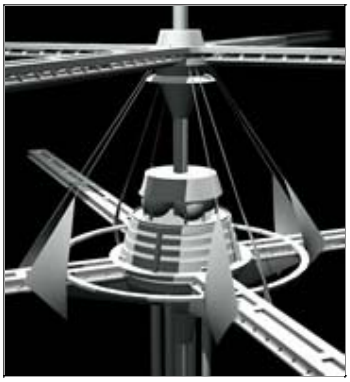
Chemistry: the video game

Will Critical Mass woo students to the field?

Emma Marris



Futuristic graphics support this unusual video game about evil robots and chemistry.

Credit Kellen Maicher

You are deep underground in a lab that once housed some of the finest minds in chemistry. But robots directed by a crackbrained artificial intelligence have taken it over and plan to use its equipment to destroy the world! After freezing an evil robot with your handy wrist-mounted hot-and-cold gun, you reach the Haber-Bosch room. And now you must correctly synthesize ammonia or die.

"Your students are playing video games," Gabriela Weaver told a group of chemistry teachers at the American Chemical Society meeting in Atlanta, Georgia, on 29 March. "They are playing them more and more hours a day. They are probably playing them *in your class.*"

If you can't beat 'em, join 'em. Weaver, an associate professor of chemistry at Purdue University in West Lafayette, Indiana, is building a computer game about the subject - she hopes her prototype will be as appealing to students as the blockbuster games coming out of companies like Electronic Arts (EA).

Initial conditions

Naturally, her grant money is a mere fraction of what games like The Sims or Myst cost to develop. But she's hoping to work something up to a level where she might can attract companies with plenty of cash.

Weaver has recruited undergraduate and graduate students in chemistry and computer science to help her shape the game. She set just a few rules. "There will be shooting, but there will not be death or blood." Hence the hot-and-cold gun, useful for on-the-go reactions and incapacitating enemy robots. "I don't know technically how a cold gun would work," admits Weaver.

So far they have a video that shows what Critical Mass will eventually look like (http://web.ics.purdue.edu/~kmartine/). So far it's a lot of shooting with some chemistry missions mixed in.

Get a reaction

Educational video games have not yet gone big, despite a fair amount of enthusiasm among educators, at least among those who do not see video games as inherently stultifying. Part of the problem is that the industry, which is dominated by players such as EA, has not figured out how to make money off them.

"They basically have a few ideas that they keep repackaging and retooling," says Eric Klopfer, co-director of Education Arcade, a game project run by the Massachusetts Institute of Technology and the University of Wisconsin, Madison.

But that strategy doesn't work for educational games, he says. "You have to have the science and the content tightly woven together." And that makes it hard to copycat successful game strategies from one subject area to another.

The right catalyst

Games are now being developed by projects like Education Arcade that teach electromagnetics, history and immunology. Klopfer says one model that might work is to have institutions such as universities take the initial financial risk, and then hand likely looking games to smaller video-game publishers.

The details of how games can be integrated into curricula are still being worked out. Some have talked about shorter games that fit the length of a class.

Others have pitched the idea of video games as homework - a proposal unlikely to elicit too much protest from students unless, of course, the games are perceived as very uncool. And therein lies the challenge of playing on student turf.

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