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## More and More, Schools Got Game

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Teachers Turn to Simulations, Other Software for Variety of Lessons

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Lifelong gamer Russell Alford, 15, usually has to wait until his homework and chores are finished before he can play Call of Duty 4, but this semester he got to play another video game at school. His finance class at Marshall High School in Fairfax County designed avatars and saved a virtual city from an oil spill -- earning points for teamwork, research on the world's water supply, business ethics and negotiating skills.

As Net-generation teachers reach out to gamers, classrooms across the country are becoming portals to elaborate virtual worlds. Business and science classes from Woodbridge to Frederick are sampling sophisticated software that allows students to try out potential careers, practice skills or explore history through simulated missions in national parks, ancient cities or outer space.

Teachers have long yearned for the rapt attention students lavish on mutants and aliens, but stereotypes of video games as violent or brain-numbing have slowed their entry into schools. While the military and even medical schools are turning to "serious games" or simulations for training, the Software and Information Industry Association estimates that instructional games make up only a tiny portion of the \$2 billion-a-year educational software industry.

But lately, researchers and educators say sentiment toward gaming is changing. Advocates argue that games teach vital skills overlooked in the age of high-stakes tests, such as teamwork, decision-making and digital literacy. And they admire the way good games challenge players just enough to keep them engaged and pushing to reach the next level.

"There is a revolution in the understanding of the educational community that video games have a lot of what we need," said Jan Plass, co-director of the Games for Learning Institute, based at New York University and funded by Microsoft to research how video games can help learning.

The Pew Research Center reported in September that 97 percent of youths aged 12 to 17 play video games, and half said they played "yesterday." Time spent glued to the screen is often particularly high in wired, affluent communities such as Fairfax, where a survey this year showed that almost three out of four students play video games or use the computer for non-school-related stuff an hour or more each night.

A new generation of game designers is borrowing from the sophisticated platforms and stunning graphics that captivate students for hours after school. They hope to channel the kind of feverish determination students exhibit when stealing a car in Grand Theft Auto and redirect it toward more wholesome pursuits, such as algebra.

Dimension M, a suite of math games developed by New York-based Tabula Digita, was created in a "first-person shooter" format, though the action figures carry no weapons. In one game, players aim to stop a biodigital virus from taking over the world, while learning about functions and solving equations. Hundreds of schools in Chicago and New York and several Florida school systems are playing the games, which cost \$10 to \$20 per student for the year. They soon will be piloted in several Virginia schools.

Another series, Quest Atlantis, developed by educators at Indiana University, takes students into simulated environments, such as Taiga National Park, where they role-play scientists seeking to learn why rivers are depleted of fish. More than 20,000 students around the world logged on to play the free games in the 2007-08 school year, a fourfold increase from the year before.

Compelling games can help schools compete for students' attention, advocates say, even as many teenagers are tackling complex projects on the Internet in their free time.

Outside of school, kids "are writing fan fiction, blogging, designing clothes," said James Paul Gee, a University of Arizona education professor and author of the book "What Video Games Have to Teach Us About Learning and Literacy." "They can become an expert in anything by learning on the Internet, and they can find a community to support it."

Private foundations and the National Science Foundation have contributed millions of dollars to developing or studying games. The U.S. Education Department awarded a \$9 million grant in September to a New York-based education firm to develop games for the hand-held Nintendo DS to weave into middle school science lessons.

The Federation of American Scientists is promoting educational gaming as a way to inspire a new generation of scientists. It has developed two games, including Immune Attack, in which players fly through blood vessels attacking fierce bacterial invaders. The free game, which has been tried out at McKinley Technology High School in the District, has been downloaded from the federation's Web site 6,000 times since April.

To make further inroads into the educational market, video game producers must win over teachers who are loaded down with curriculum demands and pressured to improve student test performance.

Some research has shown that games such as Quest Atlantis and Tabula Digita can boost the time that students spend on problems, depth of responses, even test scores. Larger-scale studies are still under way. A revision to the Higher Education Act approved last summer authorizes the creation of a research center for assessing and developing educational technologies such as simulations and video games.

Timothy J. Magner, director of educational technology for the Education Department, said games could themselves become powerful assessment tools. Computers can capture data about every player

move, he said, and teachers can see "at the mouse-click level" how students make decisions and when they struggle.

Business classes have been among the first to use complex educational simulations. Knowledge Matters, based in Florence, Mass., sells business simulations that allow students to manage sports teams or stores. The games, as well as some history games, are used in 4,000 schools nationwide, including some in Prince William, Howard, Frederick, Arlington and Alexandria.

Accounting firm Deloitte developed the game Spill! and offered it free to schools to teach basic business lessons and encourage students to pursue jobs in the field.

Marshall High teacher Kimberly Fields, 27, who grew up with Super Mario Brothers and Sonic the Hedgehog, said she adopted Deloitte's game in her class to help students practice skills and get a more realistic sense of the business world.

Russell said he was impressed by the unpredictability of the game's plot. He also liked the competition. In the end, his team scored 12th out of more than 1,000 teams participating across the country. "I got really into it," he said.

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