Game on! Instructional design researcher works to make learning fun

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It's a frustrating problem for many of today's parents: Little Jacob or Isabella is utterly indifferent to schoolwork during the day but then happily spends all evening engrossed in the latest video game.

The solution isn't to banish the games, says one Florida State University researcher. A far better approach, advises Valerie J. Shute, is to make the learning experience more enjoyable by creating video games into which educational content and assessment tools have been surreptitiously added — and to incorporate such games into school curricula.

To Jacob and Isabella, such games would remain a pleasant diversion — but to Mom and Dad, they would provide reassurance that their child is acquiring the knowledge and skills needed to excel in an increasingly competitive world.

"The concept is known as 'stealth assessment,'" said Shute, a professor of instructional systems at Florida State. "Essentially what we try to do is disguise educational content in such a way that kids aren't even aware that they're being assessed while they're engrossed in gameplay."

To accomplish that, Shute employs video games that have been specially designed to give educators a means of reviewing how students solve complex tasks while immersed in virtual (computer-generated) worlds. How students react to new challenges and put evidence together — without the pressure of having to remember a large body of information and then take a paper-and-pencil exam — can reveal a great deal about

creative problem-solving skills and other important "21st-century competencies" that traditional testing cannot.

"Everybody likes to play," Shute said. "And so much could be done to support learning using games."

Stealth-assessment technologies also have several other advantages over more conventional teaching and testing methods.

"Based on a student's responses to various situations that come up during the course of playing a video game, the game itself can be programmed to assess where that student might be especially strong or weak in core competencies," Shute said. "The game can then adapt its content so that the student is exposed to more or less information in that area. And it continues to assess the student's progress to determine how well he or she is learning the embedded concepts and skills.

"So in theory, not only can these stealth-assessment games measure a student's current level of knowledge in a given area, they can also determine areas where that student needs to improve and then help him or her to make those improvements, using feedback, maybe easier problems, and so on," Shute said. "In that sense, it can be a fantastic learning tool as well as an assessment tool."

Still other important features of such games, adds Shute:

- They can be used to assess a student's knowledge on a specific topic both at the beginning and at the end of the game, thus providing numerical data that illustrate how much the student has learned.

- They can be easily customized to meet the educational strengths

> and weaknesses of individual students. In this manner, each student can learn at his or her own speed and be appropriately challenged.

In a related area involving computerized learning, Shute and two colleagues have received a U.S. patent for a "method and system for designing adaptive, diagnostic assessments."

"Essentially, the patent is for a computer algorithm that we developed," she said. "The algorithm applies 'weights' to a student's responses to specific tasks within a game, then uses those weights to measure proficiency levels. With that information, the game knows whether to assign additional tasks to the student in a particular area or move on to another area."

Shute was the lead researcher on the adaptive-algorithm project. Her fellow researchers were Russell G. Almond, now an associate professor in FSU's Department of Educational Psychology and Learning Systems, and research scientist Eric G. Hansen. All three worked at Educational Testing Service in Princeton, N.J., when the patent application was filed in 2006.

"After almost 25 years of working on ways to use computers to enhance learning, I'm delighted to see that the concept of stealth assessment appears to be making some serious headway," Shute said. "It's important that we change the way education thinks about what competencies are important to support in students (that we're not currently doing) to yield excellent global citizens. We also need to develop new kinds of assessments to capture and make sense of this new information.

"Stealth assessment within engaging learning and gaming environments might be one of the key tools we can use to improve the way we teach our children and the way they learn," she said.

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