

Teachers Design Computer Games as Learning Tools

A Policy and Action conference at the Friday Institute in September will facilitate a discussion of state and national leaders about how to enhance innovation in middle grades.

Five years ago when Len Annetta was in graduate school at the University of Missouri, teachers were bemoaning how children today are different.

“They are not doing the stuff we used to do when we were young,” the teachers said, blaming video games for mindless distractions hour after hour when the kids get home from school.

With end-of-grade, “back to basics,” multiple-choice testing for the masses, and mechanical instruction methods, there is growing concern that children are not learning to think as much as they are mastering memorization of isolated facts in order to answer questions on the tests. Yet, when they get home from school, children devour new information and concepts. In what Annetta calls a “stealth-learning” environment, children are developing skills that connect and manipulate information in the virtual world of a video game.

Annetta thought that instead of trying to fight what children obviously enjoy, perhaps the enticement of video games could be used to enhance K-12 education. At first, people laughed and dismissed the idea with the same disdain they held for the video games that had usurped the activities they enjoyed as children.

But while attending an education conference, Annetta listened to Chris Dede, a professor in learning technologies at Harvard University, present his research and development of a video game learning tool called Multi-User Virtual Environment Experiential Simulators (MUVEES). It gave Annetta confirmation that his idea had merit. “He was doing exactly what I wanted to do,” said Annetta, who is now an assistant professor for science education in the College of Education at N.C. State University.

He sent a proposal to develop video games for education to the National Science Foundation (NSF), and the reviewers there laughed as well. He then adopted a more “scholarly” name for his work, calling it Highly Interactive Fun Internet Virtual Environments in Science, or HIFIVES – a catchy acronym and more formal way of referring to video games. A \$1.2 million, three-year NSF grant was awarded in September 2005 for research conducted at the Friday Institute.

The goal is for teachers to supplement their teaching curriculum by developing video games, which will be hosted at the Friday Institute and made available through the Internet to teachers throughout North Carolina and beyond.

Far more advanced than the video games of previous decades, today’s video games resemble movies with rich three-dimensional graphics and characters controlled by players. Participants play a role in a story, often engaged in some sort of quest. When compared with conventional teaching, such as lectures or assigned reading, the games present fun, interactive learning environments. Teams of students assume the roles of characters in the game, exploring a

For more information:

<http://ced.ncsu.edu/hifives/>
<http://courses.ncsu.edu/ems594/common/ignite/index.html>
<http://www4.ncsu.edu/~lannett>



Len Annetta is the principle investigator of HIFIVES and an assistant professor for science education at N.C. State University.



Learning in a “Virtual” World

Video game environments created in the HIFIVES research project engage students in fun, interactive learning. Teams of students assume the roles of characters in video games, exploring a virtual world and collaborating to solve challenges.

virtual world and collaborating to solve challenges. “This takes problem-based learning and brings it to life,” Annetta said.

Tom Miller, vice provost of Distance Education and Learning Technology Applications unit (DELTA), sponsored the pilot study that led to the NSF grant. Miller’s organization provides technical support, and he is collaborating with John Park, associate professor of science education, to develop teacher training tools.

Annetta said other work has started to research and validate the effectiveness of learning through video games, including measuring science. For example, one game challenges students to combine analytical skills with biological concepts to solve the murder of an Egyptian pharaoh. The players must find the pharaoh’s tomb and analyze the shroud of the mummified corpse. Upon discovering ancient blood samples, students can analyze the DNA and test the results against possible suspects to find the pharaoh’s murderer.

Annetta and other members of the N.C. State University College of Education are collaborating with N.C. State’s Department of Computer Science, (DELTA), Kenan Institute for Engineering, Technology and Science, and the N.C. DPI to implement HIFIVES.

Michael Young, associate professor of computer science at NCSU, is creating the game development tool so that teachers can build their own games without having to master computer programming. “We want to provide the tools for teachers to develop their own games,” Annetta said. “They know their curriculum better than anyone.”

William Tucci, director of K-12 programs for the Kenan Institute for Engineering, Technology and Science, is working to recruit teachers to develop games aligned with the state science curriculum objectives set forth by the N.C. Department of Public Instruction. He recruited the first five teachers through the Kenan Fellows program and will lead workshops in the summer to train the next 10 teachers.

