

The CSTA Voice

Article Submission Template

Please complete and submit by April 10, 2007

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Questions to: Pat Phillips at cstapubs@csta.acm.org

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A couple sentences to be used in the “About the author” block:

Terrel Smith has taught computer science at Sherwood High School, a school of approximately 1,000 students, in Sherwood, Oregon for 20 years. He is involved in the Oregon affiliate of the Computer Science Teachers Association and is active in planning and teaching in the association’s workshops and seminars.

Topic: Innovative teaching using gaming

Your title suggestion: Game Design as a Gateway to Computer Science

Recommended content word count:

Other Resources readers might find useful such as URLs or books, etc?

URL’s on the text

Are you aware of any upcoming events related to this piece or computer science in general readers might be interested in? (title, dates, location)

OCSTA Superquest workshops:

June 25-29 @Hillsboro High School, Hillsboro Oregon

July 23-27 @Western Oregon University, Monmouth, Oregon

Topics: Lego Robotics, Game Design, Java

Website: www.superquest.org

Enter text below. Please do not include special formatting in your text.

Game Design as a Gateway to Computer Science

Computer science programs in Oregon high schools have declined over the last 15 years. Budget restraints, curricular priorities, lack of computer science teachers, a decline in the high-tech job market, and a lack of technology resources are among a long list of reasons for this. The high-tech industry would like to hire more domestic workers, and the colleges and universities would like to graduate more computer science majors.

John Nordlinger, program manager for the Microsoft Research External Research Programs group (MSR ER&P) says, “The decline in computer science enrollment threatens virtually every U.S. industry that relies on software innovation to build its future. Developing new, more enticing computer science programs is too large a task for academia to tackle on its own. Microsoft and

other IT companies must work alongside academia and help provide funding and other resources necessary to reignite interest in computer science.”

The computer science “pipeline” is large enough to handle a larger flow of post-high school students and workers, and the job prospects appear to be promising. The U.S. Bureau of Labor Statistics reports computer systems analysts, database administrators, and computer scientists are expected to be among the fastest growing occupations in the United States, increasing by 36 percent or more through 2012.

In the fall 2006, Sherwood High School changed the first trimester programming course, previously Visual Basic, to include game design, with the course title “Introduction to Computer Science through Gaming”. The enrollment in the class went from 45 in 2005-2006 to 88 in 2006-2007. Seventy percent of the students said they had taken the class because of the gaming content.

I used the program Gamemaker, (www.gamemaker.nl), as the vehicle to introduce programming concepts to these first year programming students. After five weeks of game design, students transitioned into Visual Basic.net for the remaining seven weeks of the trimester. The students were engaged and enthusiastic about the games they were programming, and experienced success as they transitioned from gaming to Visual Basic. It is early to determine the ultimate outcome, but the enrollments in the second and third trimester computer science courses have been up from the previous year.

This concept is not without challenges. Gender balance remained the same, with girls comprising around 18 percent. Curriculum time was lost transitioning from Gamemaker to Visual Basic development environment. One possible answer to that problem is the program Phrogram (www.phrogram.com). The interface and code window resembles the Visual Basic Integrated Development Environment (IDE). I will be using this program as our gaming gateway for the 2007-2008 school year.

This concept is not so much about gaming as it is about catching students’ attention, giving them early success, and showing them the relationship between design and outcome. Other programs besides Gamemaker and Phrogram that can meet these criteria include Alice, and a long list from the following website: <http://www.gamediscovery.com/game-design/game-design-software.asp>

Several groups in Oregon are “parallel processing” with the hope of increasing computer science enrollment in secondary schools, colleges and universities. The Oregon affiliate of Computer Science Teachers Association provides workshops on computer science issues such as gaming, Lego Robotics and Java programming (www.superquest.org). The Software Associates of Oregon Foundation provides financial support for the efforts of the Oregon Computer Science Teachers Association. OPAS (Oregon Pre-engineering and Applied Sciences Initiative) includes secondary, university, and industry representatives (<http://opas.ous.edu>) creating strategies for promoting computer science in Oregon secondary schools. The Engineering and Technology Industry Council (ETIC) has a website at <http://getreal.ous.edu> which is a good resource for high school students considering computer science and engineering careers.

I am confident we can increase the numbers of students in computer science programs using the hook of game design. Once exposed, many of these students may pursue other computer science offerings in high school and college, and consider high tech careers.