

## *Introduction to Computer Science Through Game Design*

### *Attracting High School Students to the Secondary CS curriculum*

Like teachers across the country, teachers in Oregon are investigating new ways to engage students in computing courses and at Sherwood High School, we have significantly increased student enrollment in computer science (CS) by building our beginning course around computer game development,

The enrollment in the first trimester programming course at our high school nearly doubled when we included game design and changed the title to "Introduction to Computer Science through Game Design." Our class size jumped from 45 students in 2005-2006 to 88 students in 2006-2007 and 75% percent of the students reported taking the class because of the gaming content. Enrollments in the second and third trimester CS courses are also up from the previous year.

The reinvention of this course was not so much about gaming as it was about catching students' attention, giving them early success, and showing them the relationship between design and outcome.

I used the program *Gamemaker* as the vehicle to introduce programming concepts to these first-year programming students ([www.gamemaker.nl](http://www.gamemaker.nl)). After five weeks studying game design, students transitioned into *Visual Basic.Net* for the remaining seven weeks of the trimester. The students were engaged and enthusiastic about their programming success in projects such as maze games, driving and flying games, Mario-type games, shooting and explosion games, factory simulations, and brick games. The CS content in this course includes design, variables, objects, event procedures, decision structures, counters, accumulators, documentation, event handling, functions, and scope of variables.

Focusing a CS course around game development is not without challenges, however. Gender balance remains problematic, with girls comprising about 18% of the class. Managing curriculum time can also be a challenge. I will be using *Phrogram* ([www.phrogram.com](http://www.phrogram.com)) in the second level game programming course for the 07-08 school year. The interface and code window resembles the *Visual Basic* Integrated Development Environment (IDE) and will ease the transition.

I am confident we can increase the numbers of students in CS programs using the motivation of game design. The enjoyment, challenge, and success of game development may encourage more students to pursue other CS courses in high school and college, and to consider high-tech careers.

Our efforts to increase enrollment in our school parallels similar efforts throughout Oregon secondary schools, colleges, and universities. The Oregon affiliate of Computer Science Teachers Association (with financial support from the Software Associates of Oregon and TechStart) provides workshops on CS topics such as gaming, Lego Robotics, and Java programming ([www.superquest.org](http://www.superquest.org)). The Oregon Pre-engineering and Applied Sciences Initiative (OPAS) includes secondary, university, and industry representatives who are busy creating strategies for promoting CS in Oregon secondary schools ([opas.ous.edu](http://opas.ous.edu)). The Engineering and Technology Industry Council (ETIC) is also a valuable resource on CS and engineering careers ([getreal.ous.edu/](http://getreal.ous.edu/)).

For a list of other programs that can be used to integrate game development into high school CS curriculum visit: [www.gamediscovery.com/game-design/game-design-software.asp](http://www.gamediscovery.com/game-design/game-design-software.asp).

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