Saving Your Computer Science Courses

SuperQuest Spring Conference 2010

Workshop Overview

- **Introductions**
- **Where we are**
- **Opportunities/Avenues for Saving Computer Science**
- **Next Steps**

Introductions

- Your Name
- What You Teach and Where
- How You Came to Teach Computer Science
- Your Biggest Concern
- Why You Came to this Workshop

Required Credits for Graduating

- **Current graduates (2009-10) are required to have**
  - **3 credits of Math**
  - **2 credits of Science,**
  - **1 credit of Career & Technical Education, The Arts, and/or Second Language**
- **By 2014, graduates are required to have**
  - **3 credits of Math at Alg I and higher**
  - **3 credits of science (2 of those with lab experiences)**
  - **3 credits in Career & Technical Education, The Arts, and/or Second Language (any one area or in combination), and**
  - **among other essential skills, demonstrate the ability to apply math in a variety of settings**

At the National Level

- **According to the NSF's "A Week to Focus on Computer Science Education"**
  - ***"Most school districts and states lack computer science curriculum standards, few K-12 teachers have a computer science background and most computer science courses are elective, not mandatory."***
  - ***"In a 2002 Computer Science Teachers' Association (CSTA) survey, only 17 percent of the teachers mentioned having a state-mandated computer science curriculum at the high school level, and only one percent said the course were mandatory"***
  - **http://www.nsf.gov/news/news_summ.jsp?cntn_id=116059**
- **The percent of high schools with rigorous computer science courses fell from 40% to 27% from 2005-2009.**
- **The percent of high schools with introductory computer science courses fell from 78% to 65% from 2005-2009.**
- **For more information, check out the Computer Science Education Week website**

CTE – Career Technical Education

- The goal of CTE is "to help Oregon high schools support and prepare students in the acquisition of demanding, industry-based technical and academic knowledge and skills, needed for success in high school and postsecondary preparation, for demand-driven careers."
- Computer science courses fall under Computer Technology
  - CTE Licensure is listed as Computer Technology
  - The Most relevant standards are titled, Software Engineering (http://www.ode.state.or.us/apps/oss/default.aspx?cla=311&c=950&fa=1042#FA)
- There are two main requirements for a CTE program:
  - Licensure (of the teacher)
  - Program Approval (see the link from ODE http://www.ode.state.or.us/search/results/?id=225)

CTE: Pros & Cons

- **Pros:**
  - **Seniors need a Focus Program of Study / Senior Project (mandated by ODE)**
  - **Graduates will need 3 full credits of fine arts, language, or CTE**
  - **Already implemented & supported by the state of Oregon**
  - **The only official existing endorsement for an educator**
  - **Perkins money can help your program and your own professional development**
- **Cons:**
  - **In order to get your CTE license, you need to have professional experience**
  - **only CTE-licensed teachers can teach a CTE course**

A Note on Applied Academics

- According to ODE, "To enhance the relevance of education for students, the State Board broadened the definition of what could qualify as courses that meet math and science requirements."
- Key Points in the document:
  - For example, a course in applied mathematics would need to have sufficient content at the level of Algebra 1 and higher
  - The responsibility still resides with the local school district
  - It can be a course, long-term project, integrated instruction, or some combination of these
  - all credit for core academic subjects, including elective credits, must be awarded by a highly qualified teacher
  - in many cases, applied academic courses can be taught by teachers who are not licensed in the core content areas.
    - For example, A teacher licensed to teach agriculture can teach an agricultural science class that meets graduation requirements for science
- From http://www.ode.state.or.us/teachlearn/certificates/diploma/appliedacademiccredit.pdf

Offering Math Credit

- According to the OPAS Initiative, "The new math standards, adopted in June 2009, include discrete math as a way to meet graduation requirements"
  - http://opas.ous.edu///Workgroups2007/Prepare/CS_in_OR_June2009_v5.pdf
- The other area is Math in CTE
  - provides great opportunities for the student who struggles in math or seeing the connection and needs more hands-on help
- Pros
  - There is a lot of support growing for Discrete Math
    - Techstart will provide workshops in cooperation with OPAS
    - OPAS is behind it
    - There's money dedicated for it
  - It's open source (no upfront costs) There's a great online textbook with examples using Python (also open source)
    - Mathematics for the Digital Age (http://www.skylit.com/mathandpython.html)
  - If you already have a Math endorsement, it should be an easy integration (from a licensure standpoint – as well as through Math)
  - Provides another avenue to get math credit, particularly with a more interesting subject matter than just math for math's sake
- Cons
  - Not for all CS teachers

Offering Science Credit

- **Current Science Standards in Oregon that apply**
  - **H3 – Scientific Inquiry**
  - **H4 – Engineering Design**
  - **See Process For Assigning Science Credit**
- **Q: When's the next time the state of Oregon will revise science standards?**
  - **Oregon just approved the science standards last year**
  - **2016 will be the next time Oregon reviews science standards**

Computer Science Standards

- As confirmed by Tom Thompson, the only existing standards that directly address computer science in Oregon are the Oregon Skill Sets: Software Engineering
- It looks like it's up to us
- Opportunities:
  - SuperQuest:
    - CS4HS
    - Discrete Math Workshops
  - The Computational Thinking Trend
  - CSTA's Exploring Computer Science Curriculum (http://www.csta.acm.org/Curriculum/sub/ExploringCS.html)
    1. Human Computer Interaction
    2. Problem Solving
    3. Web Design
    4. Introduction to Programming
    5. Robotics; and
    6. Computing Applications

Next Steps

- **How Can We Help You Now (in this workshop)?**
- **How Can SuperQuest Help You In the Coming Years?**
- **How Can You Help Give Computer Science the Credit it Deserves?**