OPAS Succeed Workgroup

North Salem High School
Don Kirkwood's CS Program

May 19, 2008

North Salem High School in the Salem-Keizer School District has 36% ethnic minority students, 13% of them ELL students and 53.9% free and reduced lunch students. Don Kirkwood, veteran teacher of math, computer science, AP Computer Science and interdisciplinary courses, has created a program of events and activities which is successfully increasing recruiting high proportions of girls and minorities to his computer science classes.

The elements of this program include:

- A progression of CS classes
  - CS 1
  - CS 2
  - C++ (an object-oriented, relatively modern programming language)
  - AP CS - Java (an object-oriented, relatively modern web-oriented programming language)
- An "AB" class schedule instituted in 2007-2008 school year, so student classes differ on alternating days
  - Don's Honors Geometry class alternates with CS 1 in this schedule.
    - Geometry shows a practical application for the CS
    - 3 weeks of QBASIC procedural programming language for graphics & animation
    - Alice or Scratch – languages optimized for games & animation
    - Python or Pascal – procedural languages optimized for math, task and character manipulation
- Recruiting activities which appear to have made a large difference:
  - NBA == No Boys Allowed: Current girl students organize, publicize, run and are volunteer assistants at activity centers during a day-long event, hosting middle school girls on a no-students-at-school day.
    - Flash and Dash: 10 to15 minute presentations given by high school students to middle school classrooms. These presentations include high tech problem solutions, cool graphics, job opportunities and then a pitch for the NBA Conference and sign up.
    - Activity centers: usually a 4 class rotation, taught by teachers, with hands-on activities designed to take about an hour, selected from the following:
      - Computer Science: graphics and animation
      - CAD (Computer-Aided Design)
      - Networking

            - Engineering Design using woodworking as the medium
            - Robotics
        - Swag is featured:
            - T-shirts designed by the student leadership team
            - Door prizes such as desktop & laptop computers, printers, cameras
        - Social interaction is an important aspect:
            - Pizza
            - Guest speaker – if possible, a former female student now working in some aspect of a technical career
            - Teachers teach the centers
        - Associated budget: $2,500
            - District funds cannot be used for pizza and door prizes. Fund-raising, sponsorships, grants and in-kind donations have been suggested as funding mechanisms.
            - Since this is for school district students the use of building is free and student provide their own transportation to program (would probably be even more successful if program was on a day when high school is out and middle school students get to miss school to attend function; no dates like this exist in Salem-Keizer)
            - Consumables are minimal and teachers usually cover these with existing budgets; we are recruiting students for our own programs, so expenses are worth it.
    - Follow-up visits to the feeder middle schools advanced math classes, sharing (see Don's OACTE presentation for an example aimed at an adult audience: http://opas.ous.edu///Committees/Resources/Staff_papers/Kirkwood_OACTE_041608.pdf):
        - Career statistics & occupational outlook data :
            - Salaries
            - Job opportunities
            - Helping Society
        - Scholarship opportunities
        - College Credit Now
        - Paid Internships
        - Interdisciplinary Computer Science/ Honors Geometry combo – do your homework on computers
            - Sign-up
    - Student-led technology conference for fellow students at Chemeketa
        - All district students are invited – but the focus of advertising for the event is in technology classes.
        - Chemeketa recruits universities and local businesses to set up exhibit tables aimed at student participants (OSU, OIT, PSU, …)
        - Chemeketa and/or MWEC provide lunch
        - Greg Smith runs a robotics competition (a pared-down event based on FIRST LEGO League) concurrently, also at Chemeketa.
- Recruiting activities used in the past which did not appear effective enough:
    - Personal letters sent to 8th graders, attached

- Visit high school classes before registration date
- 8th grade parent orientation visitation (no longer done).
    - Gym table and activities
    - Parents in discussion groups
    - All 8th graders seeing a PowerPoint presentation discussing the academies available. North's new academy structure is now calling Don's group STEAM – STEM with the addition of Art. It's unique, but with a very positive art group, Don thinks it will be very effective.

CS Class Enrollment Data

Class	Demo	2008-09	2007-08*	2006-07*	2005-06*
CS1	Total	129	55	21	19
	TBD	55			
	Female	39	16	3	3
	Latino	35	20	5	4
CS2	Total	93	41	14	28
	TBD	24			
	Female	36	12	3	6
	Latino	33	13	5	6
C++	Total	53	21	24	20
	TBD	53			
	Female		4	3	1
	Latino		17	7	5
Java	Total	82	25	25	23
	TBD	82			
	Female		4	3	1
	Latino		7	10	5

Notes:

- * closely approximated from old grade books
- 2008-09 demographic stats are incomplete at this time, as Don's breakdown is based on only those students he personally signed up.
- 2007-08:
    - schedule changed to AB; students no longer able to take 4 CS classes during 1 year
    - Final recruiting mechanisms in place for this registration:
        - Visiting middle schools
        - Interdisciplinary Honors Geometry & CS combo
- 2006-07: non-AB schedule, so only the largest class was counted
- 2005-06: non-AB schedule, so only the largest class was counted

Proposed Support Mechanisms for Program Propagation

Not every school can copy this program "verbatim." Some particular barriers might be:

- AB schedule
- Need to develop community support
- Ready availability of resources like Chemeketa for Tech Conference
- Current student population to act as near-peer recruiters

Because several schools expressed interest in learning more about how Don achieves his results, Don has sketched the following framework for supporting the development of locally appropriate programs:

- Summer Meeting of interested teachers, sponsored by SuperQuest/Techstart:
  - Bill Crucial – Deaf School
  - Greg Smith – West Salem High School
  - Kathy Roberson – McNary High School
  - Jim Lorenz – South Salem High School
  - Steve Nelson – Hillsboro High School
  - Chris Winikka – Century High School (Hillsboro?)
  - Mike Reams – North Salem High School
- Agenda:
  - Discuss North Salem's process and statistics (1 hour)
  - Each teacher works up with a similar process tailored to their school (4 hours)
    - Mutual brainstorming
    - Leader critique
  - Each teacher develops a grant proposal for an "Equity Conference/Event" (2 hours)
    - Funding through the minigrant program tied to SuperQuest that we hope to kick-start. See attached draft application form
- Funding -- $1,920 (assumes venue is free & copying of materials donated):
  - $1400 - $200 stipend per attendee per day
  - $400 – Kirkwood's stipend → per Don "OK, but other funds more important"
  - $120 -- $15 per person for beverages, snack and lunch
- Fall follow-up half-day meeting:
  - Double-check process, adapted steps, compare experiences & adjust
  - Assuming subs are not needed, cost is about $840 if teachers and Don receive $100 stipends.

Equity Mini-Grant Application

Funds are granted to high school teachers for the purpose of developing an event focused on attracting young women and/or other underrepresented populations to computer science and engineering courses at the grantee's high school. While not all programs will be immediately successful, data must be collected to verify if the program is successful. All grantees must submit copies of all relevant receipts after the event, and follow-up statistics and a short status report after the high school's registration for the recruiting target year. Grantees not submitted such data and reports will not be eligible for further awards.

<table>
<tr><td>School:</td><td></td></tr>
<tr><td>District:</td><td></td></tr>
<tr><td>Present Year:</td><td>
<table>
<tr><td></td><td>School</td><td>CS/ Eng Courses</td></tr>
<tr><td>Number of Students</td><td></td><td></td></tr>
<tr><td>% Female</td><td></td><td></td></tr>
<tr><td>% Latino</td><td></td><td></td></tr>
<tr><td>% African American</td><td></td><td></td></tr>
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</td></tr>
<tr><td>Detailed Description</td><td>
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<tr><td>Date of Event:</td><td></td></tr>
<tr><td>Activities Planned</td><td></td></tr>
<tr><td>Participants</td><td></td></tr>
<tr><td>Dealing with what equity issue</td><td></td></tr>
<tr><td>How will this event encourage diversity in your program?</td><td></td></tr>
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<tr><td>Budget Description – How will the money be used?</td><td></td></tr>
<tr><td>Budget Table</td><td>
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<tr><td>Venue rental</td><td></td></tr>
<tr><td>Transportation</td><td></td></tr>
<tr><td>Consumables for activity stations</td><td></td></tr>
<tr><td>Publicity
Incentives – door prizes</td><td></td></tr>
<tr><td>Refreshments</td><td></td></tr>
<tr><td>Other</td><td></td></tr>
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</td></tr>
<tr><td>Signature of Grantee</td><td></td></tr>
<tr><td>Approval of Supervisor</td><td></td></tr>
<tr><td>Approval of Principal</td><td></td></tr>
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8th Grade Recruiting Letter to Parents of Girls

Dear Parent(s);

The explosion that has occurred in technology over the last decade is one of the few present trends that we can be assured will continue throughout this century and beyond. Very recently, the US Department of Labor stated that, even with the economic slow down; there are still 410,000 information technology jobs in the US that are unfilled. North High is attempting to be a leader in the computer realm of this expansion and would like to encourage more students to be directly involved with this area. Some of the results of our attempts have been:

1. Two individuals, Manfred Mueller and Sam Kelly, won 2nd place in the US in last year's FBLA programming competition; one in Java and one in C++. Manfred actually tied the winner, but turned in exam a bit later than the eventual winner.

2. Over the last several years many seniors left North planning on majoring in computer science or engineering – quite a few of these are young women. Among this group of students, the amount of scholarship money and computer lab assistant positions are phenomenal.

3. Several students have placed very high in the Linfield Computer Science Scholarship Exam; some earning as much as $16,000.

4. North students can learn Java (receiving up to 12 hours of college credit - through CS 260), C++ (through preparation for the Advanced Placement AB Computer Science Exam), a two year Cisco Networking class, and/or NTech, where students built, repair and maintain computers and labs.

5. The last several years, Oregon's Agriculture, Forestry, Department of Consumer and Business Services and the Department of Human Resource have employed several teams of North students. These students get credit, are paid nicely and are building fantastic resumes. These students have been assigned to work on Access programming, web page designs, networking, hardware and software installation and solving the 2000 bug in COBOL. Students who have been able to learn Java or C++ by their sophomore year, and have taken N-Tech will have preference for these positions. Taking Intro to Computer Programming, CS I, CS II and AP Advanced Projects - Java, during the first term of a freshman year, is the major way to get on track for this opportunity.

Unfortunately, women have traditionally been denied access to the cutting edge of this technological growth. One of our goals is to attack this disparity and provide a well-trained group of students who are encouraged no matter what their gender. After reviewing our records, we feel your daughter would both benefit by taking Intro to Computer Programming and be an asset to our program. Even though you may have already preregistered, you may still change her schedule. If you have any questions or decide to take advantage of this opportunity, please contact Don Kirkwood at 304-9440 (h) or Don as soon as possible and, we will walk it through the system. If your daughter hasn't already completed her schedule for next year, and desires to take advantage of this opportunity, please have her sign up for part or all of the following sequence of one quarter classes: Intro to Computer Programming, CS1, CS2 and Advanced Computer Projects – C++.

Thank you,

Don Kirkwood
AP Computer Science Instructor