



Voice

Equity

The Voice of K–12 Computer Science Education and its Educators

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Best Practices

Addressing Equity in our Classrooms

Joanna Goode

TO THOSE FAMILIAR with computer science (CS) education, the importance of our subject in the daily lives and work of people worldwide is clear. In recent years, social networks, smartphones, and other computing developments have had global impacts on connectivity, education, and economic health. As CS educators, we are in a distinctive position to bring new computing concepts to the classroom and develop the next generation of computer scientists. And yet, overwhelmingly, only a sliver of our student population is given the opportunity to learn about this important field.

With such global impact, there is a compelling interest for CS to draw from the range of perspectives that flow from a diverse group of students. Yet, there is little diversity, in terms of gender or race, in CS education. The current statistics about our diversity problem are grim. The 2012 Advanced Placement exam had a huge upswing in test-takers, and yet, female participation dropped slightly to 19.7%. Only 12% of participants were African American, Latino(a), or Native American. Compared to other Advanced Placement courses in STEM fields, these participation rates are the lowest for both gender and race.

So, what is it about CS education that leads to these statistics? And, as teachers, how can you disrupt these trends to impact change in your own classroom?

Studies have highlighted that much of this problem can be traced to belief systems about who “belongs” in CS. These belief systems impact which classes are

offered in which schools. For example, schools with high numbers of students of color often do not provide CS courses to students. When courses are offered, counselors and teachers tend to steer some students, particularly females and students of color, away from these courses and towards courses filled with students of similar demographics. Often, these belief systems operate by confusing previous preparation and experience around computing with an innate ability to learn CS. This creates differentiated access for groups of students based on initial home privilege, which then serves to perpetuate these unexamined belief systems.

Beyond access to courses, we also know that many diverse students have trouble connecting with the curriculum and pedagogy of traditional CS courses. For instance, focusing exclusively on programming languages for a first course fails to allow students to learn about the larger field of CS, its importance to society, and relevancy to students. Presenting a “single answer” does not highlight the dynamic efficiency and quality tradeoffs that is an important computational practice and more authentic to diverse students. In fact, research has shown that providing a positive classroom culture, connecting student interests and experiences with curriculum, and allowing students to engage in inquiry around academic concepts leads to rich learning for all students.

As part of the Exploring CS (ECS) program, I have had the opportunity to work with teachers in developing solu-

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ADDRESSING EQUITY IN OUR CLASSROOMS

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tions for these equity issues. We worked with Los Angeles school district leaders to create the ECS curricular materials, obtain college preparatory course status, and advocate for increased course offerings in high schools. The yearlong ECS course curriculum was

designed to attract diverse students to the course through its inquiry approach, project-based assessments, and inclusion of culturally situated activities. Because of

a focused effort to support schools with large numbers of students of color, over 88% of students enrolled in Los Angeles ECS courses are Latino(a) or African American. Girls account for over 40% of the 2100 students studying ECS in Los Angeles schools.

In the accompanying two-year professional development, we talk together about how particular instructional techniques can create equitable learning environments for students. The wisdom of practice that has emerged from the past five years of these conversations with ECS teachers include:

- Connecting CS to students' lives by linking teaching and curriculum to students' experiences at home and in their communities.
- Teaching through conversation, in particular engaging students in instructional dialogue.
- Teacher and students producing together through joint activity.

Because of a focused effort to support schools with large numbers of students of color, over 88% of students enrolled in Los Angeles ECS courses are Latino or African American.

- Developing literacy across computing curriculum using journals and other written assignments.
- Teaching complex thinking.
- Engaging in reflective practice around pedagogy and equity.
- Working closely with counselors to recruit diverse students.

- Building relationships with teachers from other schools, colleges, and universities to address supporting more CS for underrepresented populations on a wider scale.

As we move towards a nationwide CS10K campaign aimed at increasing the number of students studying CS in high schools, we must keep in mind this stark underrepresentation of our field and work towards broadening participation in computing. Though policy can help in creating courses in schools that satisfy particular educational requirements, teachers have the most impact in recruiting underrepresented students into these classes and building instructional learning environments that foster both excellence and equity.

LEARN MORE:

Stuck in the Shallow End: Education, Race, and Computing

www.exploringcs.org

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CSTA Voice is a quarterly publication for members of the Computer Science Teachers Association. It provides analysis and commentary on issues relating to K–12 computer science education, resources for educators, and information for members. The publication supports CSTA's mission to promote the teaching of computer science and other computing disciplines.

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Collaborative Projects

Engage Underrepresented Youth in CS

Mylene Padolina and Vicky Raya

THE COMPUTER SCIENCE COLLABORATION PROJECT (CSCP), a national initiative funded by the National Science Foundation, partners with CSTA to increase participation of underrepresented groups in computer science (CS), with a particular focus on Hispanic/Latino(a) youth and youth with disabilities. The CSCP works to:

- Build collaborations between K–12 education, community-based organizations, higher education, and industry.
- Maximize access to shared resources among representatives from these groups who are interested in expanding and broadening participation in CS.
- Strengthen the capacity of existing and evolving K–12 formal and informal CS programs.

The CSCP's goal to strengthen the capacity of K–12 programs is partially achieved through the compilation of resources for educators on the CSCP website. Visitors will find links to webinars, newsletters, research, and exemplary practices, as well as lesson plans and curriculum, such as those from Culturally Situated Design Tools (CSDT) and AccessIT.

Since many cultural art designs are based on mathematical principles, CSDT offers lesson plans teaching standards-based math and computing as youth develop their own art creations. AccessIT's web design and development course curriculum is for use in grades 9–12. The cross-platform, vendor-neutral curriculum emphasizes standards-based and accessible design. Extensive disability resources on the CSCP website include information on various types of disabilities along with teaching strategies, learning environments, and assistive/adaptive technologies that foster the inclusion of youth with disabilities and enable them to reach the same goals set for youth without disabilities.

Three CSCP mini-grant funded projects provide examples of how collaboration, along with accessible technologies and

inclusive learning environments, can positively impact CS participation of youth with disabilities.

SMARTer Boards: Girls Solve Visual Accessibility Issues, a project led by Illinois State University, resolved to make SMART Boards accessible to students with visual impairments. Four multi-generational, cross-functional teams developed solutions including bridging the SMART Board to an iPad to allow personal interaction and the programming of lessons with auditory cues.

Before collaborating on their CSCP project (*Engaging Youth with Disabilities in Basic Computer Game Development*), the Caldwell Alternative School's only interaction with the Boys and Girls Club of Fitchburg and Leominster, MA, was using their gym for physical education classes. They expanded their collaboration efforts to offer video game development courses to Caldwell's students with learning disabilities.

The *High School High Tech Internship Project of Lee & Charlotte Counties* in Florida also focused on bringing CS within reach and making it less intimidating. Five high school students with disabilities worked in IT departments at various organizations, testing and installing software, setting up hardware, and serving as helpdesk assistants. Through their experiences, students gained skills and began to see technology-focused careers as viable options.

Building on research and evidence-based practice, the CSCP Engaging Hispanic/Latino(a) Youth Leadership Team developed the Exemplary Practices for Engaging Hispanic/Latino(a) Youth in CS (www.cscproject.org/?q=node/162). This document provides the following five key recommendations:

1. Offer culturally targeted recruitment and programming.
3. Foster family involvement.
3. Carefully select and train staff members.
4. Include relevant CS content.
5. Address the image of CS.

continued on page 4



Let us know if
your contact
information changes.

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Contribute to the CSTA Voice

The editorial board of the **CSTA Voice** is dedicated to ensuring that this publication reflects the interests, needs, and talents of the **CSTA** membership. Please consider sharing your expertise and love for computer science education by contributing newsletter content.

Potential writers for the **CSTA Voice** should send a brief description of the proposed article, estimated word count, statement of value to members, author's name and brief bio/background info, and suggested title to the editor at: cstapubs@csta.acm.org. The final length, due date, and title will be negotiated for chosen articles. Please share your knowledge.

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Letters to the Editor are limited to 200 words and may be edited for clarification.



ACM founded CSTA as part of
its commitment to K–12
computer science education.

CSTA Equity Resources



PD Videos

csta.acm.org/Communications/sub/Videos.html

- › Stuck in the Shallow End
- › What Research Tells Us



Reports

csta.acm.org/Communications/sub/Reports.html

- › Addressing Core Equity Issues
- › The New Educational Imperative



Snippets Podcasts

csta.acm.org/Communications/sub/Podcasts.html

- › Cultural Computing
- › Diversity
- › Education, Race, and Computing
- › Making CS Accessible
- › Making Students Comfortable in CS



Posters, Brochures, Videos

csta.acm.org/Resources/sub/BrochuresPostersVideos.html

COLLABORATIVE PROJECTS

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At San Bernardino School District's Crafton Hills Community College the *Learning CS through the Lens of Culture and Society* mini-grantee project, led by CSTA member Margaret Yau, aligned its design and activities to these practices. This week-long summer workshop for sixteen high school students in Yucaipa, CA, followed a two-day teacher training workshop. Culturally targeted recruitment and programming for Hispanic/Latino(a) youth who had not traditionally engaged in these programs at Crafton Hills, became a collaborative effort between the lead organization, local school districts, and community-based organizations, including churches.

Programming activities were focused on mobile application development via bilingual (English-Spanish) modules which addressed topics of relevance and interest to the students. Family involvement was consistently fostered throughout the week as students were encouraged to reflect on and share their learning experiences at home and family

members were invited to an end-of-project showcase. Staff members were carefully selected to enable Crafton Hills' college students studying computing to work directly with youth. Each staff member functioned as a team "lead" and served as a near-peer coach and role model. CS content was introduced using exercises and programming. In addition, information on CS education and career paths was provided. Bilingual mobile modules created for this project and a detailed project summary are free and available online at the Crafton Hills' *Learning CS through the Lens of Culture and Society* website: sites.google.com/site/chcs4hs2012.

The CSCP resources focused on engaging underrepresented youth in CS and additional information about all of the CSCP mini-grant funded projects can be found at: www.cscproject.org.

LEARN MORE:

Disability-focused resources

www.cscproject.org/?q=node/80

Minority-focused resources

www.cscproject.org/?q=node/78

Computing Meets Culture

It's All About Inclusion

Valerie Taylor and Richard Ladner

ALTHOUGH ETHNIC MINORITIES and people with disabilities are usually considered as two different groups, we have come to realize that they have much in common and an understanding of the particular culture is required for true engagement. The Center for Minorities and People with Disabilities in IT (CMD-IT, pronounced "command it") was organized in 2010 to insure that underrepresented groups are fully engaged in computing and information technology, and to promote innovation that enriches, enhances, and enables these communities (www.cmd-it.org).

CMD-IT is working to incorporate culturally-situated tools for teaching math and computing into the Boys and Girls Clubs and develop culturally-relevant projects for introductory programming

courses. "Culturally responsive pedagogy" refers to the alternative approaches in which educational material, such as math and computing, is presented in ways that provide a better fit to minority cultural orientations and perceptions.

The NSF-funded project (Broadening Participation in Computing grant CNS 0837717) involving the Boys and Girls Club sites focused on two such frameworks—AADMLSS City Stroll (African American Distributed Multiple Learning Styles System, developed by Juan Gilbert at Clemson University) and CSDT (Culturally Situated Design Tools, developed by Ron Eglash at RPI)—that have been developed for math education. CSDTs, however, have been extended to focus on computing concepts under the name of programmable CSDTs or pCSDTs, using a drag-and-drop interface.

The pCSDTs are a suite of program-mable web applets that simulate cornrow hairstyles, skateboarding, breakdance, adinkra and kente cloth designs, and Native American beadwork and weaving. The following pCSDTs can be found at: csdt.rpi.edu.

- **Cornrow Curves:** A single “plait” (twist of hair) is replicated through iterative geometric transforms, generating a cornrow braid simulation. Students typically begin by imitating the braid patterns they see in real hair, but quickly learn that they can use this as a creative tool, exploring abstract patterns that take advantage of nested iteration, color mapping, and other computational ideas.
- **Skateboarding:** Users program a virtual landscape in which animated characters simulate various skateboarding feats that model reality as well as explore the unique capabilities offered by a physics engine.
- **Adinkra Cloth:** Adinkra symbols are stamped on cloth in Ghana. Students control logarithmic and linear spiral curves to simulate these symbols, and generate their own cloth designs.

- **Virtual Bead Loom:** Users learn about the Native American tradition of the “four directions,” and how traditional loom work can be translated into iterative algorithms. As they incorporate more complex color patterns, the need for data structures naturally emerges.

Diversity in computing education offers exciting opportunities for computer science teachers. First, it allows us to contribute to the capabilities of our nation’s workforce. According to the 2008 Census Bureau projections, African Americans, Hispanics, Native Americans, and People with Disabilities currently account for 57% of the population. Low participation in computing education for these “majority minorities” harms our nation’s ability to compete in the global marketplace. Second, it allows us to contribute to the ability of those living in low-income communities to raise their living standards. Imagine for example, how inner city life could change if we could double the number of underrepresented youth in computing careers!

Summer Computing Academy

Seeking Talented Deaf and Hard of Hearing Students

Robert Roth

THE SUMMER ACADEMY FOR ADVANCING DEAF AND HARD OF HEARING IN COMPUTING is seeking 15 talented deaf and hard of hearing students in high school or college, ages 16 and over, who excel in math, science, and/or computing. This challenging academic program at the University of Washington enables participants to earn college credits while learning about computer science (CS) careers and how math and science intersect with CS.

Students will study computer programming and learn about animation while participating in the production of an animation short. Guest speakers, who are themselves deaf or hard of hearing and currently work in computing fields at Salesforce, ZVRS, IBM, Microsoft, and other companies, will tell about their careers and meet with students in one-on-one interviews. Attendees will have the opportunity to visit *continued on page 8*

CSTA congratulates **Margaret Yau**, Assistant Professor, Computer Information Systems, Crafton Hills College

as a recipient of a Computer Science Collaboration Project (CS CP) grant for her work encouraging Hispanic and Latino(a) students in Yacaipa, California, to explore CS concepts and careers.

Meet the Authors

Tracy Camp

Colorado School of Mines

Tracy is a Professor of CS and co-chair of SIGCSE 2013.

Joanna Goode

University of Oregon

Joanna is an Associate Professor of Education Studies. She is the Chair of CSTA’s Equity Committee and co-author of *Stuck in the Shallow End: Education, Race, and Computing*.

David Herman

CS Educator, Ohio

David teaches CS at New Albany High School and Eastland-Fairfield Career & Technical Schools.

AnnaLise Hoops

Technovation

AnnaLise is the Director of the Bay Area Technovation program for Iridescent, an educational nonprofit.

Richard Ladner

University of Washington

Richard is a Professor of CS and serves on the Board of Directors for CMD-IT.

Brian Magerko

Georgia Tech

Brian is an Assistant Professor of Digital Media and Director of the Adaptive Digital Media (ADAM) Lab.

Mylene Padolina

CS Collaboration Project

Mylene Padolina currently serves as the Project Manager for Engaging Youth with Disabilities.

Vicky Raya

EdLab Group

Vicky Raya currently serves as the Diversity Program Manager focusing primarily on the CS Collaboration Projects.

Robert Roth

University of Washington

Robert is the program manager for Advancing Deaf and Hard of Hearing in Computing.

Valerie Taylor

Texas A&M University

Valerie is a Professor in the Department of CS and Engineering and the Executive Director of the CMD-IT.

Paul Tymann

Rochester Institute of Technology

Paul is Chair of the CS Department and co-chair of SIGCSE 2013.

CS Principles Update

Learn More about CS Principles at SIGCSE

Tracy Camp and Paul Tymann

SIGCSE 2013 attendees will have several workshop opportunities to learn more about the proposed Advanced Placement Computer Science (AP CS) course. On Friday, *CS Principles and the Beauty and Joy of Computing Curriculum* and *Teaching the CS Principles Curriculum with App Inventor* will be the topics of two three-hour workshops. On Saturday, attendees will learn more about the how the AP Principles course is developing and about the growing community of CS Principles teachers during the *CS Principles: Development and Evolution of a Course and a Community* session.

The annual SIGCSE Technical Symposium will be held March 6–9 in Denver, Colorado. A number of SIGCSE 2013 talks and sessions focus on the theme “The Changing Face of Computing,” how changes in computing technology and changes in student demographics require a change in the way computing is taught. The symposium provides a forum for sharing new ideas for syllabi, laboratories, and other elements of teaching and pedagogy at all levels of instruction.

While the full symposium may be of interest to K–12 educators, sessions on Friday and Saturday have been designed to be of special interest to the K–12 community. Friday morning begins with an Alice breakfast which will be followed with the keynote by Michael Kölling, the inventor of Greenfoot (a tool for teaching Java via an interactive visual world). Paper and panel sessions on Friday cover a variety of topics, including *Teaching CS1*, *Growing Female Enrollments*, and *Tools to Support Novice Programmers*, as well as an evening workshop for organizing summer camps. On Saturday, there are panels on *Professional Development for K–12 Teachers* and *Embedding CS in K–12 Classes*. For a complete list of sessions, papers, and workshops, visit: www.sigcse.org/sigcse2013.

There are special registration rates available to K–12 teachers. SIGCSE 2013 offers a one-day (Friday or Saturday) registration rate of \$80 for early registration (\$110 for late or onsite) and a two-day (Friday and Saturday) registration rate of \$150 for early registration (\$180 for late or onsite). Both registration options include access to all keynote talks, sessions, and the exhibit hall. A Saturday registration also includes the conference luncheon. Workshop registration is additional—\$70 for early registration (\$85 for late and \$100 onsite). Register online at: www.regonline.com/Register/Checkin.aspx?EventID=1151219&lbrd=1&

Equity Initiatives

The STEM Girls Club

David Herman

What happens when you invite a group of high school girls who are interested in science, technology, engineering, and math to a weekly working lunch? You solve a national problem!

As you know, there is a huge shortfall between the number of engineers and computer scientists needed for the future and the number of qualified people available to fill the positions or in the academic pipeline. And the current labor pool for many of these fields is overwhelmingly male. We cannot fill future positions by recruiting from only half (the male half) of the population—nor should we. Too few young women are in the academic pipeline of many STEM disciplines. To increase the number, we must increase interest at the high school level.

We asked some of the most talented girls in our high school to think of a solution to this problem. They told us that we have to start at middle school, supporting those girls who are interested in STEM subjects before social pressures (and in some cases, parental pressures) quash their interest in STEM careers. From this the STEM Girls concept was born.

The STEM Girls Club meets once a week for a working lunch. STEM Girls has a dual mission. First, engage girls in activities that provide mutual social and academic support, while sampling a variety of STEM fields through guest speakers and hands-on activities. Second, develop middle school outreach activities to help support interests, build confidence and intellectual courage, and create a sense of community, including mentoring and role model relationships. The hope is that these activities at the middle school will ease the transition to high school and the STEM experiences available there.

Outreach activities to the middle school currently being planned or underway include: an after-school STEM exploration program, math tutoring for eighth-grade girls, and a high school “shadowing” day. Club members are designing club shirts and have submitted articles about STEM careers and classes for the principal’s parent newsletter.

Members of STEM Girls have received several awards, scholarships, and exciting opportunities. Two received National recognition this year from the National Center for Women & Information Technology (NCWIT). Three received state-level awards from NCWIT. Another interned at a university medical center and became the youngest person ever to train on the Da Vinci Surgical Robot System. They have been featured in the local press and on our CBS-affiliate evening news. Three STEM Girls presented their stories to the 2012 Ohio Educational Technology Conference. Afterward, they received two requests to repeat the presentation at upcoming national conferences. Some senior members have been accepted at some of the finest colleges and universities in the country, including Harvard and MIT. They serve as outstanding role models for the STEM Girls that will follow.

The STEM Girls Club gives students an opportunity to become involved in something authentic, practical, and immediate that goes beyond academic support and career exploration. It gives them another leadership opportunity, another outlet for their growing interest in making a difference in the world. It provides a safe opportunity to rehearse the very behaviors they need to master in order to excel in college and beyond.

And THAT is the story of the STEM Girls Club. We see it as a scalable, sustainable, replicable model that any high school in the country could use to help increase the number of young women in STEM education and in the career pipeline.

View the video of their story in their own words (www.youtube.com/watch?v=yk_yuCJhZXg).

To learn more about the STEM Girls Club concept, contact teacher David Herman (dherman@napls.us).

Student Opportunity

Technovation Competition for Girls

AnnaLise Hoopes

Technovation, a global all-girls app development challenge for students in grades 8–12, is inviting girls to compete for \$10,000 by building mobile phone apps and pitching their ideas to venture capitalists.

Students work with teachers at their schools (club advisors) and women in technology (mentors) to build mobile apps over the course of 12 weeks. Technovation provides all the

curriculum and support to help students get started. This year’s challenge is to solve a problem in the local community.

At the end of the 12-week program, teams submit their projects and compete in a regional competition. Each regional finalist team competes in San Francisco at the World Pitch Day, where girls from around the world will pitch their ideas to venture capitalists and compete for \$10,000 in seed funding to launch their companies and take their apps to market.

Technovation aims to help girls develop the confidence and skills they need to be technology leaders. Neither students nor teachers need experience coding or developing apps prior to participating in Technovation. Using Technovation resources, they will learn App Inventor, a blocks-based language similar to Scratch and designed for beginners. Most Technovation participants had no prior computer science training before their experiences in Technovation, but many have been inspired to take computer science courses after participating in the challenge.

Find a mentor and start a Technovation club at your school today. Register for the competition (www.technovationchallenge.org) or contact annalise@iridescentlearning.org.

Curriculum in Action

Reaching a Diverse Population with Audio Remixing

Brian Magerko

The EarSketch project at Georgia Tech is a new computer science education effort that combines software and curriculum to engage introductory computing students in the process of computational audio remixing and appeals to diverse populations of students because it provides a form of musical expression that does not rely on Western music theory.

As part of the EarSketch program (led by Dr. Brian Magerko, an assistant professor in Digital Media, and Dr. Jason Freeman, an associate professor in Music), students write code that operates on the level of controlling musical samples, rhythmic beats, and audio effects that provide a highly accessible form of musical expression. Students write Python code that is connected to Reaper, a commercial but affordable digital audio workstation (DAW) environment. The code that they write lays down musical samples on different tracks, which can be augmented by applying rhythmic patterns or effects with the EarSketch API.

Much like remix artists do with bits of audio, video, or images and computer programmers do with code samples and libraries, EarSketch students actively participate in the reuse and adoption of code from other works. Along with the “writing code for laying out music in a DAW” paradigm, EarSketch includes a media sharing website where students can upload their EarSketch projects, browse through and play others’ projects, and, most importantly, download code snippets from other student works for reincorporation in their own work.

EarSketch has already been tested with students at various grade levels. We initially worked with a local teacher in an afterschool computing program for grades four and five at Nebo Elementary (earskech.gatech.edu/blog/nebo). Students successfully worked through the initial curriculum, even though it was intended at the high school level, and produced a group remix project that was used in a school rally (vimeo.com/40971142#at=0).

During the summer of 2012, we also used EarSketch during a week-long workshop for 18 high school students hosted by Barbara Ericson and the Georgia Tech Institute for Computing Education. Students worked on individual projects, pair programming exercises, and even brought in musical instruments to improvise along with student EarSketch work.

We found very strong effects on using EarSketch as a method to increase students’ computing confidence, motivation to succeed in computing, and personal creativity.

Based on the feedback from the students and teacher during the workshop, we are currently revamping the curriculum and API for use at Lanier High School, where 75 beginning programming underclassmen will pilot about 30 hours of curriculum material. After further curriculum development in 2013, our final pilot will be at Lanier High School in fall 2013, where an introductory computing classroom will use EarSketch.

The EarSketch API and social media sharing site will be publicly accessible in spring 2013 for interested parties. To receive news sign up at: groups.google.com/forum/?fromgroups#!forum/gt-earskech-announce.

Spotlight

Promoting CS Education

Poster Contest Winners Announced

The 2012 “We are the Faces of Computing” student poster contest was a tremendous success. To celebrate CS Education week, CSTA announced the winners in each of the three competitions. Check out the winning posters, runner-up winners, and additional posters at: csta.acm.org. Congratulations to all!

Elementary School

Khal Bashawaty, Daniel Meder, Sanjana Vakacharla, Tyler DiMartino (4th graders) *Teacher:* Patrice Gans, Fraser Woods Montessori School, Newtown, CT

Middle School

Ayana McClanahan, Kayla Davis, Shaakira Bannister, Freedom Watson (8th graders) *Teacher:* Carlos Baez, Kelly Miller Middle School, Washington, DC

High School

Jerome Williams *Teacher:* Deb Wilson, Lincoln Park High School, Chicago, IL

2012 CSTA Poster Contest Facts

- 107 posters entered
- 25 teachers
- 23 schools
- 15 states (CA, IL, MI, OR, GA, PA, VA, CT, MA, NY, CO, WA, OR, DC, FL)
- 2 countries (US and Croatia)

SHOW ME THE NUMBERS			
Out-of-Balance Career Representation			
	% POPULATION	% COMPUTER SCIENTISTS	% CS BACHELOR DEGREES
Black	13	5	10
Hispanic	16	4	8
Female	51	25	18
People with Disabilities	19	7	Unknown

Source: NSF, Division of Science Resources Statistics. Women, Minorities, and Persons with Disabilities in Science and Engineering: Special Report NSF 11-309 (2010) www.nsf.gov/statistics/wmpd/start.cfm



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SEEKING TALENTED DEAF AND HARD OF HEARING STUDENTS

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several technology companies in the Seattle area including Adobe, Google, Isilon, Microsoft, and Valve.

"It was wonderful to meet other deaf and hard of hearing students like me who are interested in math, science, and computing. It was like a big, happy family!" is a typical response from past attendees.

Tuition, room and board, and round-trip transportation are provided at no cost to selected applicants. The Summer Academy is made possible by the Bill and Melinda Gates Foundation, Johnson Scholarship Foundation, National Science Foundation, and Google.

Admission to the 2013 Summer Academy is competitive, based on an assessment of academic ability and enthusiasm to participate in this intensive learning experience. There are two deadlines: December 21, 2012, and January 25, 2013. Learn more about the program and the application process at: www.washington.edu/accesscomputing/dhh/academy.

LEARN MORE:

Advancing Deaf & Hard of Hearing in Computing
adhhc.cs.washington.edu

Please Help

K-12 CS Expansion Project Survey

Your thoughts are needed to help researchers understand how professional development opportunities can impact plans for growing the number of teachers and learners of computer science. Be sure you are counted in this important study by the University of Chicago's Urban Education Institute (UEI) and the Center for Elementary Mathematics and Science Education (CEMSE).

Complete the survey and be entered to win a prize:
bit.ly/teacherSurvey.

Post your professional development events on the CSTA website by contacting l.clayborn@hq.acm.org

[csta.acm.org/ProfessionalDevelopment/
sub/TeacherWorkshops.html](http://csta.acm.org/ProfessionalDevelopment/sub/TeacherWorkshops.html)

MARK YOUR CALENDAR

USA Computing Olympiad: January Contest

January 11-14, 2013
www.usaco.org

Java Fundamentals and Programming Teacher Training and Curriculum

January 21-April 26, 2013, Orlando, Florida
academy.oracle.com/pages/prog_commit_inst_institute.htm

FETC

January 28-31, 2013, Orlando, Florida
fetc.org

TCEA

February 4-8, 2013, Austin, Texas
tceaconvention.org

Richard Tapia: Celebration of Diversity in Computing

February 7-10, 2013, Washington, D.C.
tapiaconference.org/2013

USA Computing Olympiad: February Contest

February 8-11, 2013
www.usaco.org

Java Fundamentals and Programming Teacher Training and Curriculum

February 11-May 17, 2013, Cambridge, Massachusetts
academy.oracle.com/pages/prog_commit_inst_institute.htm

ACSL Contest #2

February 15, 2013
www.acsl.org

International Technology and Persons with Disabilities Conference

February 25-March 2, 2013, San Diego, California
www.csun.edu/cod/conference/index.php

SIGCSE 2013

March 6-9, 2013, Denver, Colorado
www.sigcse.org/sigcse2013

USA Computing Olympiad: March Contest

March 8-11, 2013
www.usaco.org

Summer Academy for Advancing Deaf and Hard of Hearing in Computing

June 21-August 24, 2013, Seattle, Washington
www.washington.edu/accesscomputing/dhh/academy

Annual CSTA Conference (formerly CS & IT)

July 15-16, 2013, Boston, Massachusetts