csta Voice

Back to School

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

Volume 7, Issue 4 September 2011

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CSEd Week

CS & IT: 11 Years of Success

THE 11TH CSTA COMPUTER SCIENCE & INFORMATION TECHNOLOGY CONFERENCE (CS & IT) concluded with a bang that capped three days of engaging workshops, exciting sessions, and the celebration of the World Finals of the Microsoft Imagine Cup.

CS & IT is the major annual professional development event for CS and IT teachers. This year more than 225 registrants spent three days in New York City attending workshops and sessions.

Adding a day of hands-on workshops prior to the traditional CS & IT schedule enabled teachers to participate in three-hour training experiences on a variety of topics from game development and strategies for a successful Advance Placement program to applying the latest cloud technologies and innovative teaching strategies to classroom instruction.

Douglas Rushkoff, the author of *Program or Be Programmed: Ten Commands for a Digital Age*, opened the conference with a keynote that challenged educators to rethink how CS education teaches children to direct technology rather than merely be directed by it. This theme of the power and excitement of CS was echoed by Ken Perlin, an Academy Award winning professor in the Department of Computer Science at New York University, whose closing keynote focused on using simulation and game development tools to change the face of CS education.

Between these two powerful presentations was a jam-packed day of sessions that included topics such as: Teaching Mobile Programming; Computational Thinking; Connecting Workplace STEM Needs to the Classroom; Introductory CS Experiences; the CS Principles Pilot; Modular Arithmetic and RSA Encryption; CS Education Week; and many more.

During the third day in NYC, Microsoft treated attendees to an exciting range of events in conjunction with the Imagine Cup Finals. Attendees were inspired by the message of Dean Kamen (inventor of the Segway personal transport device and originator of FIRST Robotics); provided an inside peek at innovative computer games in formal and informal educational settings at the NYU Games for Learning Institute; and informed by Paul Tymann's talk about the unofficial pilot of the new CS Principles course at Rochester Institute of Technology and surrounding high schools. The day concluded with the extravaganza of the Imagine Cup Finals at Lincoln Center, where 400 university and college finalists showcased their award winning CS projects. Attendees were awed and inspired by the projects ranging from malaria detection systems to adaptive technologies.

Most of the presentations and video recordings of sessions will be available for download from the conference site (*www.csitsymposium.org*).

This year's CS & IT Conference was sponsored by Microsoft Research, Google, and The Anita Borg Institute, with Microsoft taking the role of the primary sponsor of the main conference day and the Imagine Cup day. Microsoft has long been a supporter of the conference and was its first corporate sponsor.

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CSTA THANKS

Mark Hindsbo, Kent Foster, Marla Ellis, Alfred Thompson, Jodi Ellias, and Aimee Sprung

of Microsoft for their generous support of and hard work at CS & IT 2011.

SIGCSE Grant Opportunity

EACH YEAR, SIGCSE AWARDS a limited number of Special Projects Grants to help members investigate and introduce new ideas in the learning and teaching of computing. Projects must provide some clear benefit to the wider disciplinary community in the form of new knowledge, developing or sharing of a resource, or good practices in learning, teaching, or assessment.

The application process is relatively informal. Proposal submissions have no closing date but are considered three times per year, in mid-May, mid-August, and mid-November. An application must indicate the purpose of the project, how it will be conducted, the start date and duration of the project, reasons why the project is particularly timely, and its expected outcome.

In addition to the specified project outcomes, successful proposers also agree to:

- Submit a brief report on their completed project for the SIGCSE Board;
- Consider submitting related papers or posters to SIGCSE-sponsored conferences such as the SIGCSE Symposium, ITiCSE, and ICER; and
- Take part in the Special Projects Showcase at the SIGCSE Symposium or present a paper or poster at the ITiCSE Conference summarizing the results of the project.

Additional information about the application process, as well as previous projects, are available at: *sigcse.org/programs/special*.

The Computer Science Collaboration Project

Building Powerful Connections

Brenda Britsch and Karen Peterson

HAVE YOU EVER TRIED to find a computer science (CS) professional to visit your classroom? Have you ever wondered what informal educators in your community are doing related to CS? Would it be helpful to know what other practitioners from around the country are doing to engage underrepresented youth in CS? These are all questions the Computer Science Collaboration Project (CSC) helps answer.

The CSC Project aims to efficiently increase participation of underrepresented groups in CS opportunities and activities by effectively building collaborations between K–12 education, community-based organizations, higher education, and industry. Funded by the National Science Foundation, the CSC Project partners with CSTA, CAHSI (Computing Alliance of Hispanic-Serving Institutions), and AccessComputing, to focus in particular on K–12 efforts designed to engage and serve Hispanic youth and youth with disabilities.

By creating collaborations among organizations committed to engaging underrepresented youth in computing, we can improve opportunities by leveraging resources and expertise, sharing effective

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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.

Change of Address and Membership Questions: Contact Member Services via e-mail at *cstahelp@csta.acm.org*, or call 1-800-342-6626 (U.S. & Canada) or +1-212-626-0500 (Global).

Criteria for submitting articles: Potential writers for CSTA should send a brief description of the proposed article, estimated word count, statement of value to members, author's name & 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.

strategies, and filling gaps without duplicating services.

Building on the National Girls Collaborative Project's innovative model to facilitate and support collaboration among practitioners serving girls in STEM, the CSC Project includes in-person and online collaboration opportunities, mini-grants as an incentive for collaborative projects, and dissemination of exemplary practices via a website, webcasts, and professional development events.

The CSC Project website highlights valuable resources related to increasing participation of underrepresented groups in CS, including the Program Directory, current education and employment statistics, links to relevant projects and organizations, exemplary practices, and archived webcasts. The online database includes program descriptions, available resources, program needs, and contact information.

Collaboration Leadership Teams comprised of experts in K–12 outreach, computing, and engaging underrepresented groups will offer in-person collaboration events across the United States, focusing specifically on engaging Hispanic youth and youth with disabilities in computing. These events will provide opportunities for networking, sharing of resources and exemplary practices, and professional development.

There are a number of ways for CS teachers to get involved with and benefit from the CSC Project.

- Enter your school or program in the Program Directory to network, share resources, and collaborate on CS-related projects for K–12 youth.
- Attend our free webcasts or view our webcast archive in which practitioners and researchers from across the country share effective strategies.
- Join the CSC Project listserv to receive a monthly listing of resources, events, and news.

Providing opportunities for CS teachers to connect with other practitioners and professionals in the field, resources, and professional development, the CSC Project strives to make CS activities and courses within reach for all students. For more information visit: *www.cscproject.org*.

IT Literacy Teaching Modules

Larry Press

IT LITERACY COURSES designed for all students—not just technology students—have been around a long time. And over the course of the past 50 years, both the content and delivery systems have evolved with the technology.

The first IT literacy course for liberal arts students was developed by John Kemeny and Thomas Kurtz at Dartmouth College in the 1960s (*dtss.dartmouth.edu/sciencearticle*) and was made possible through computer time-sharing. The goal of the course was to teach the technology skills and concepts needed for success both in school and after graduation.

While the goal has remained the same, the content of literacy courses has moved from the era of time-sharing to the era of the desktop. Many schools still teach desktop-era courses that concentrate on hardware and software concepts. But the focus of IT is shifting again from the desktop to the Internet and IT literacy education must follow.

Over the past few years I have developed an IT literacy course. Today, visitors to my blog will find a growing collection of over 90 teaching modules, (*cis275topics.blogspot.com*). A wide range of topics are covered in the modules including: network applications, blog development, user interfaces, wikis, privacy, audio and digital images, FTP, HTML, number systems, and data transmission.

The modules follow a similar format. Each focuses on a few skills or concepts and includes a PowerPoint presentation, keyword tags, and links to assignments and prerequisite modules. Many modules include a narrated video of the presentation and a transcript.

The modules are flexible and easy to incorporate into most classroom or independent study environments. Because each module has its own URL, it is easy to assign one or more to supplement a class or to build an *continued on page 4*

IT LITERACY TEACHING MODULES

continued from page 3

entire course by selecting many that fit the course objectives. In my semester course, I post my syllabus as a wiki page of links to the modules students will study.

In addition to being flexible, a modular approach encourages community building—the "Wikipedia effect." Students and teachers can collaborate to improve a module. For example, students might leave comments on an assignment explaining their solutions or a teacher might suggest a new example, expand an explanation, or better yet, create a brand-new module.

The modules are available at: *cis275topics.blogspot.com*. Suggestions and ideas are welcome.

Lesson Plan: Reflections in Print

Cindy James

OVERVIEW: In this activity students create an 8th grade farewell newsletter by applying skills they have previously acquired in the use of Microsoft Word and PowerPoint. They transfer those skills to learning Microsoft Publisher, the tool for the newsletter project. This activity can serve as a model for creating other projects such as research reports.

Objectives:

- Students will apply their past experience in using Microsoft Word and PowerPoint to learn and use Microsoft Publisher.
- Students will collaborate, compile, and publish their "Farewell to Norwood" class newsletter.
- One of the most important objectives of this assignment is to give students the opportunity to reflect. It is hoped that through this reflection, students will better understand how their families, teachers, and others have influenced their lives.

Resources/software/supplies:

- Microsoft Publisher
- Computers for students
- A computer connected to overhead projector or SMART Board (optional)
- Cameras (or phones with a camera) for the photographers
- E-mail accounts for students to exchange stories and photos. (Other file storage media such as network or USB drives can also be used.)
- Paper and copier to print newslettersi

Class time required:

Four 45 minute class periods

Procedure:

1. Introduce/demonstrate Microsoft Publisher.
2. Introduce the "Farewell to Norwood" 8th grade class newsletter project.
3. Show a sample project created by the previous 8th grade class, if available.
4. Distribute several copies of a local newsletter for students to examine and discuss the possibilities for the students' newsletter project. Student contributions to the class project can include interviews with their favorite teachers and staff, original stories, advertisements, horoscopes, photos, and sports coverage—anything they would find in newsletters.
5. Allow a variety of submissions and participation levels to provide differentiation and accommodations as needed. Include a variety of topics and interests so that all students will be able to make a meaningful contribution to the project.

Closure/assessment:

Use a rubric to evaluate collaboration, writing, planning, time management, technical skills, personal reflection, and other class objectives.

Notes to the teacher:

Students have been very excited about this project. For many it is their first experience with newsletter format, Publisher, and personal reflection. Those with writing challenges can create colorful ads, photograph subjects, and help with interviews. To defray the printing costs, students sell the paper for 25 cents to underclassmen. A copy is provided free to each 8th grade student.

Teaching Resources for Computing Careers

Shirley Miranda

THE CSTA WEBSITE has great classroom tools for teaching about career opportunities in computing. You will find posters, brochures, videos, website links, and lesson plans. One of the posters can be customized with your school's information and CSTA members can request multiple copies. Videos and lesson plans provide perfect classroom activities for learning about computing careers. The following resources can be previewed and accessed at: *csta.acm.org/Resources/sub/BrochuresPostersVideos.html*.

POSTERS	
Computer Science in Sports	Link CS to athletics with this poster that illustrates the connection between sports such as basketball and baseball to computing and robotics. CS is defined by fields such as computer engineering, CS, and information systems. Photos include underrepresented groups.
Computing: Expand Your Connections	Illustrate how students' interests, goals, and dreams can be realized through opportunities in computing careers. Computing is defined by fields such as information technology, software engineering, and informatics. Download a customizable version that will allow you to include your institution's logo, URL, and contact information.
IT is All About Me	Encourage students to meet with a school counselor and CS teacher to learn more about how computing can help them lead, create, connect, play, and help. IT is defined by fields such as computer engineering, CS, and information systems. Photos include underrepresented groups.
BROCHURES	
Computing for Middle School Students	Guide students in recognizing the impact of computing with a "Q and A" format. Examples: "Do you love to solve puzzles? Do you love to invent new ways to use computers? Do you love to exchange theories about new ideas?" Details are provided on how computing empowers students' dreams to help (medicine), lead (information), create (music and movies), connect (mobile devices), and play (gaming). The brochure is also available in Spanish.
Computing Careers and Degrees (brochure and website)	The content of this brochure is similar to the content of the "Computing Brochure for Middle School Students" but it is geared toward high school students. Gaming, mobile devices, medical imaging, finding information on the Web, and online movie and music distribution are highlighted and matched to corresponding computing fields. The Computing Degrees & Careers website (*computingcareers.acm.org*) complements the brochure. On this comprehensive site students can explore various computing majors and careers through a variety of features and articles. The "Top 10 Reasons to Major in Computing" puts a face and name to a career and describes, from an interest and job potential perspective, what professionals do and lists the necessary skills.
VIDEOS	
You Can Be Anything	This inspirational career video uses the power of media to give young people, particularly girls and young women, a very positive impression of the career opportunities available in information technology (IT) and science-related fields where technology plays a major role. The content traces the progress of women from "traditional careers" to Olympic gold, military officers, and engineering and technology fields. It includes a lesson plan, a student worksheet, presentation materials, and guidelines on how to use the materials.
Computer Science & Engineering Careers	Why do undergraduate students, graduate students, and faculty choose CS and engineering as their field? Six videos and a compilation of articles will answer that question with details of what takes place in the lives of professionals. Videos include: *UW Engineers Make a Difference, Pathways to Computer Science, Power to Change the World,* and *A Day in the Life* profiles of recent college graduates.
LESSON PLAN	
Careers In Computing and IT	The one-hour lesson is designed for middle and high school classrooms. Use the *IT's All About Me* poster and website links to encourage students to pursue computing fields. Students will look beyond the stereotypes and explore the skills and interests that are typical of CS careers.

Meet the Authors

Carlen Blackstone
Emmaus High School, Emmaus, PA
Carlen has taught CS for 28 years and has participated in ACSL since 1983. She has led numerous workshops for teachers and is a participant in both the Philadelphia and Lehigh Valley CSTA chapters.

Brenda Britsch
Lab Group
Brenda is the Co-Principal Investigator of the CS Collaboration Project and the National Girls Collaborative Project, two projects funded by the National Science Foundation to increase equity in CS and STEM.

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Cindy has taught CS & IT for two years in grades 5–8 and K–4. Prior to teaching, she spent 30 years in a variety of professions focusing on efficiency and technology in the workplace.

Joe Kmoch
Milwaukee, WI
Joe Kmoch has worked with Debbie Carter in the development of the CSTA *Source* web repository since 2003. Currently he is retired and working as a CS consultant.

Shirley Miranda
San Diego, CA
Shirley teaches AP CS and robotics. She serves on the CSTA Board and the UCSD COSMOS Advisory Board and is the director of the Greater San Diego Science and Engineering Fair.

Karen North
CS Educator
Karen was on the Texas Technology Application Standards CS writing team. She is an officer of ISTE SIGCT and participated in the creation of the *ACM K–12 CS Model Curriculum* Level I.

Karen Peterson
EdLab Group, Executive Director
Karen is the Principal Investigator of the CS Collaboration Project and the National Girls Collaborative Project. She leads many STEM initiatives focused on collaboration and equity.

Larry Press
California State University, Dominguez Hills
Larry is a professor of Information Systems and a former CACM columnist with a long-standing interest in IT literacy.

Go to the Source

Your Repository of Teaching Resources

Joe Kmoch

Welcome to the first "Go to the Source." In this regular column you will find descriptions of teaching and learning resources available in the *Source*—the CSTA web repository of classroom-tested materials. Please visit the *Source* to download these items and browse through the growing collection of lessons, projects, and articles submitted by CSTA members and aligned to the *ACM Model Curriculum for K–12 Computer Science*. And please, consider submitting one or more of your favorites. It is quick and easy with our online submission process at *csta.acm.org/WebRepository/WebRepository.html*.

Resources are classified according to the levels indicating approximate K–12 grade ranges (L1–L4), as well as "Strategies for Implementation," which are not specific to a particular level. Each major classification is then divided into topics. Resources can be searched by major resource type, key word, or author. Specific descriptions of the classifications are available in the *ACM Model Curriculum for K–12 CS at csta.acm.org/Curriculum/sub/CurrFiles/K-12ModelCurr2ndEd.pdf*.

JavaScript Primer by Sajeeva Pallemulle
Washington University Department of CS and Engineering Professional Development Workshop
› **L1A08:** Computer Programming (8th grade)
› **L2A11:** Programming Languages
An introduction to JavaScript with sample problems and solutions
Comment: This set of eight exercises introduces basic JavaScript. The exercises culminate in developing a simple photo album but the JavaScript concepts and ideas can be used in a number of other ways.

Post-secondary Careers Assignment by Brad Strassburger
› **L2A10, L3A10:** Careers in Computing
Career exploration communicated through a website project
Comment: This is a detailed assignment for student research of both college programs and employment opportunities. Students create websites to present their learning. A rubric is included.

Curriculum in Action

Motivating with ACSL

Carlen Blackstone

Over the past 30 years of teaching, I've taught a wide variety of computing classes, sponsored computer clubs, and explored a vast array of computing topics through professional development workshops. However, one of the most rewarding aspects of teaching computer science (CS) has been my involvement in the American Computer Science League (ACSL).

In much the same way that algebra is the foundation of mathematics, the topics of the ACSL are the foundational concepts of CS. The League competition topics include computer number systems, recursive functions, Boolean algebra, bit string operations, digital electronics, graph theory, prefix/postfix notation, data structures, Lisp, assembly language, and finite state automata. A short-problem part of the contest is coupled with a programming problem that relates algorithmic design to game theory, operating system processes, number theory, statistics, and real-life applications in a language-independent format.

The ACSL consists of six divisions designed to meet the varying computing abilities and interests of students. Four regular season contests are held at the participating schools during the school year. Based upon cumulative results after the four contests, ACSL invites the top scoring teams in each division to complete at the All-Star Contest.

Schools must register between September 1 and December 1; the deadline for completing the first contest is in December. More information, plus the results and photos of the 2011 contest, are available at: *www.acsl.org*.

Equity Initiatives

Calling All Digital Divas, Web Chix, and Coder Girls

Encourage your female high school students to apply for the National Center for Women and Information Technology (NCWIT) *Award for Aspirations in Computing*. NCWIT is looking for the next generation of technical talent. Recipients are selected for their computing and IT aptitude, leadership ability, academic history, and plans for post-secondary education. Winners receive cool prizes, gadgets, and scholarships.

Competitions are offered nationally and in more than 20 Affiliate Award programs across the U.S. Girls at all computing levels are encouraged to apply—the *Award for Aspirations in Computing* recognizes aspirations and passion for technology, not just accomplishments!

National award-winners receive a laptop computer, an engraved award for both the student and her school, and an expenses-paid trip to the national award ceremony for the student and her parent or guardian. Affiliate competition awards vary by state.

The 2012 *NCWIT Award for Aspirations in Computing* competition is open to any U.S. high school female (grades 9–12). Applications will be accepted online at *www.ncwit.org/award* beginning September 15, 2011. Applications close at 11:59 PM ET, October 31, 2011. Visit *www.ncwit.org/award* for details.

Chapter Highlights

Professional Development:
Key to Northern NJ Chapter Success

The Northern NJ Chapter of CSTA has been very active since its inception in 2009. In addition to regular chapter meetings, CSTA-Northern NJ has worked with local universities and colleges to provide professional development activities. A TECS workshop (Teacher Engagement for Computer Science) and Greenfoot workshops were hosted by Drew University in Madison, NJ. These professional development activities featured a variety of presentations including: Real Projects for Real Clients (David Klappholtz, Stevens Institute of Technology), Microsoft Game Programming and Expression Web (Alfred Thompson, Microsoft), Promoting a Code of Ethics and Professional Conduct (Steve Kass, Drew University), and Google's App Inventor for Android (Ralph Morelli, Trinity College).

A Humanitarian Free and Open-Source Software (HFOSS) workshop was held at Bergen Community College (BCC) in Paramus, NJ. The workshop was part of BCC's NSF-sponsored *HFOSS@BCC* event. Presenters shared information about open-source projects at their schools, demonstrated Google's App Inventor, and provided a series of lesson plans to help educators incorporate open-source software into computer instruction. Attendees also learned about the One Laptop Per Child project and its mission "to empower the world's poorest children."

CSTA-Northern NJ also includes professional development activities at its regular membership meetings. Chapter members lead discussions on computer clubs and contests and hands-on mini-sessions using tools such as Scratch, GameMaker, and DreamWeaver.

Classroom Tools

The Fine Art of Programming

Karen North

Attracting and engaging students in computer science (CS) with game development can certainly be effective, but that is not the only way to spark the excitement of CS and develop computing concepts. I teach CS through the arts. By approaching problem-solving through art, I find students are motivated to work through challenges that might otherwise turn them away from CS.

Using Paint, students explore bits and attributes with the pixel tools. They can use photography to explain a process by graphically sequencing steps. In my favorite CS lessons, students create graphics through programming. Some students might not be particularly talented drawing with a pencil or brush, but they can express their creativity by designing unique visuals with code. The process using DrScheme is illustrated in a video at: *cscurriculum.shutterfly.com/36*.

Dance is another art form that engages students and builds CS concepts. Researchers with the American Association of University Women reported in *Why so Few?* (2010) that, "one of the most persistent gender gaps in cognitive skills is found in the area of spatial skills, specifically on measures of mental rotation" (*www.aauw.org/learn/research/whysofew.cfm*). Programming robotic dance can improve students' spatial skills as they move their own bodies to turn right and left while facing different orientations in order to develop strategies for the robot's dance (*cscurriculum.shutterfly.com/35*). Programming "dancing" robotic bees also develops coding and sequencing skills and is an excellent strategy for young students to practice counting, adding, and subtracting using a number line. Information can be found at: *www.terrapinlogo.com*.

Elaine Kao, Program Manager, Google, described the following essential student skills in the May 2011 *Voice*: decomposition, pattern recognition, pattern generalization, and algorithm design—all of which align perfectly with the objectives in teaching CS with art. Read more about using art to engage students in "Supporting Girls in CS by Programming with Graphics" (*apcentral.collegeboard.com/apc/members/courses/teachers_corner/27701.html*).

College Connection

Editor's note: *This dialogue with Dr. Valerie Barr, Chair of the Department of Computer Science at Union College, is a continuation of our series of interviews with CSTA institutional members. Please share these details about the computer science (CS) programs at Union College with your students.*

Union College is a residential liberal arts college located in Schenectady, NY, with an enrollment of about 2100 students. Students can earn Bachelor of Science degrees in CS and computer engineering. Union also offers minors in CS, computational methods, and digital media.

CSTA: What draws students to your program and what keeps them there?
Barr: Our program is appealing at each level of a student's education. At the introductory level, students can begin their studies in one of six theme-based courses, including big data, robotics, game development, artificial intelligence, media computation, and engineering applications. At the intermediate level, Union offer courses on natural language processing, web programming, gaming, bioinformatics, visualization, and modeling and simulation. At the advanced level students can select courses such as advanced robotics and parallel and distributed computing. Students can combine computing with other disciplines through an interdepartmental major. Some students have combined CS with art, biology, the classics, economics, mathematics, political science, and psychology. Students stay in our program because they value the strong sense of community and Union's accessible faculty.
CSTA: Is a high school CS course a requirement for success?
Barr: We have worked hard to create a CS program in which students can succeed even without high school CS experiences.
CSTA: Tell us about innovative majors or programs of study.
Barr: Our computational methods minor and digital media minor are both designed to appeal to students who wish to use computing in combination with other disciplines. The interdepartmental major option provides students with the opportunity to pursue the application and relevance of computing in other subjects and career areas.
CSTA: What cool careers are your graduates prepared for?
Barr: Our students typically work in software development, training, or quality assurance.
CSTA: What distinguishes your program from others?
Barr: We are unique in our strong commitment to interdisciplinary opportunities through which students can pursue computing along with other interests.
CSTA: Tell us about the social environment of the CS program.
Barr: Students find a very congenial atmosphere in the department's student resource room and in the CS labs. We sponsor about 15 seminar sessions each year during which students can personally meet with researchers from industry and academia. In some cases, these relationships have led to job opportunities. Additionally, many students are involved in other activities on campus such as theater and athletics.
CSTA: What unique programs are in place at your school to increase the diversity of the CS student population?
Barr: The breadth of our introductory offerings allows us to reach out across the entire student body. This has led to modest increases in the number of women in our courses.
CSTA: Describe your programs related to high school outreach and professional development for high school teachers.
Barr: Over the past two years, with funding from the National Science Foundation Research Experiences for Teachers project, we have worked with high school teachers to infuse computation into math and physics courses as a way to excite students about computing.

SHOW ME THE NUMBERS

COMPUTING COURSES OFFERED IN U.S. SECONDARY SCHOOLS OTHER THAN INTRODUCTORY AND AP COMPUTER SCIENCE

COURSE TOPIC	% OF SCHOOLS REPORTING		
	2007	2009	2011
Web design	76%	68%	70%
Computer graphics	53%	51%	50%
Communications	43%	41%	40%
Networking	24%	17%	15%
Game design/development	0.6%	10%	15%

Source: CSTA National Secondary Computer Science Survey: Comparison of Results 2007–2011. Only topics reported in 2011 are included in this chart. *csta.acm.org/Research/sub/CSTAResearch.html*

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We're on the Web! *csta.acm.org*

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MARK YOUR CALENDAR

Consortium for Computing Sciences in Colleges (CCSC: Midwestern)
September 23–24, 2011, in Huntington, Indiana
www.ccsc.org/midwest/Conference

Consortium for Computing Sciences in Colleges (CCSC: Northwestern)
October 7–8, 2011, in Richland, Washington
www.ccsc.org/northwest

International Society for Exploring Teaching and Learning (ISETL)
October 13–15, 2011, in San Diego, California
www.isetl.org/conference

Consortium for Computing Sciences in Colleges (CCSC: Rocky Mountain)
October 14–15, 2011, in Orem, Utah
www.ccsc.org/rockymt

Consortium for Computing Sciences in Colleges (CCSC: Eastern)
October 14–15, 2011, in Arlington, Virginia
www.ccsc-e2011.org

Grace Hopper Celebration of Women in Computing
November 9–12, 2011, in Portland, Oregon
gracehopper.org/2011

Consortium for Computing Sciences in Colleges (CCSC: Southeastern)
November 11–12, 2011, in Greenville, South Carolina
www.ccscse.org

CSEd Week
December 4–10, 2011, in your school
www.csedweek.org

FETC
January 23–26, 2012, in Orlando, Florida
fetc.org/events/2011-conference/information/fetc-2012.aspx

TCEA
February 6–10, 2012, in Austin, Texas
tcea2012.org/2012/public/default.html

SIGCSE 2012
February 29–March 3, 2012, in Raleigh, North Carolina
www.sigcse.org/sigcse2012

Consortium for Computing Sciences in Colleges (CCSC: Southwestern)
March 23–24, 2012, in Stockton, California
www.ccsc.org/southwestern

Consortium for Computing Sciences in Colleges (CCSC: Central Plains)
March 30–31, 2012, in Springfield, Missouri
www.ccsc.org/centralplains

Consortium for Computing Sciences in Colleges (CCSC: Mid-South)
March 30–31, 2012 in Jackson, Tennessee
www.ccsc-ms.org

RESOURCES

Here's more information on topics covered in this issue of the *CSTA Voice*.

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Impact Students

Invigorate your classroom

CSEd Week
Dec. 4–10