

**CSTA 10<sup>th</sup>  
Anniversary**



# Voice

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

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## CSTA Ten Years Strong and Beyond

Deborah Seehorn

AS THE COMPUTER SCIENCE TEACHERS ASSOCIATION (CSTA) CELEBRATES its 10<sup>th</sup> anniversary, it is fitting that we reflect on what CSTA means for computer science (CS) education and CS educators. Not a day goes by without news of exciting happenings in CS education. It might be an announcement of approval by a state legislature for CS to count as a math or science credit. It might be news of an innovative new CS curriculum program. Or it might be a release of new data on the importance of CS education to the U.S. STEM workforce. In all of these stories, you can be assured that CSTA has played a significant role.

One of the most notable contributions of CSTA to CS education is the CSTA Annual Conference—the premier CS professional development event in the U.S. Participants learn about engaging content and effective teaching strategies and have a welcomed opportunity to network and collaborate with fellow CS educators.

Other professional development content and opportunities abound in CSTA; members can also interact with other CS educators through the CSTA Voice, the CSTA Advocate Blog, the CSTA Member ListServ, and various professional development events offered through local CSTA chapters and affiliates.

K–12 CS education has been advanced by the publication of the *CSTA K–12 CS Standards* and a growing collection of research and reports. The *CSTA K–12 CS Standards* and related documents delineate how the standards align to other national

standards such as *Common Core State Standards*, *Standards for Mathematical Practice*, *STEM Cluster Topics*, and the *Partnership for 21<sup>st</sup> Century Essential Skills*. Educators have used the standards and the up-to-date relevant data in other reports to build their local programs and teach their administrators the importance of a quality CS education for every child in every grade.

CSTA uniquely builds capacity in its members through CSALT (Computer Science Advocacy Leadership Team) to take on important local issues related to CS education. The recent unprecedented surge of interest in CS education and advocacy efforts in promoting CS as a core discipline are directly related to the efforts of CSTA and the CSALT members.

It is incontrovertible that CSTA is essential to the existence, growth, and success of CS education. In the ten short years of its existence, CSTA has directly impacted the exponential growth and interest in CS education.

The CS education community should not only celebrate the 10<sup>th</sup> anniversary of CSTA, but strive to ensure that CSTA continues to be a leader in supporting and nurturing CS education.

**WE WANT YOU!**



Let us know what you would like to read about in the *Voice* or volunteer to share your ideas and expertise in an article.

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## Thank you, Chris, from the Bottom of Our Hearts

Deborah Seehorn

**MOST OF THE MEMBERSHIP** is well aware that CSTA Executive Director Chris Stephenson resigned her position effective May 23, 2014. Thankfully, Chris has not left computer science (CS) education. She has accepted a new position as the Computer Science Education Program Manager at Google. This marks the beginning of a new stage in Chris' professional life and a new path for CSTA.

Chris has served as the CSTA Executive Director for 10 years. She was the visionary leader who convinced the ACM that the CSTA was a necessary and viable organization for CS educators. She was right—it is both necessary and viable. Under her direction, CSTA has grown to include over 16,000 members, both nationally and internationally. In addition, there are more than 50 local CSTA chapters throughout the U.S. and Canada.

Under Chris' leadership, CSTA has published many notable resources related to CS education, including *Running on Empty*, *Bugs in the System*, and the *CSTA K–12 Computer Science Standards*. Additionally, Chris has been a driving force behind the advocacy events that are bringing due attention to the state of CS education, and the need to make CS count. Chris has been a true supporter of the classroom CS educator and worked diligently to move CSTA to build volunteer leadership capacity in the membership through its Advisory Council, Board of Directors, committees, chapters, and CSTA's CS advocacy and leadership program (CSALT).

Anyone who has not already read Chris' blog post *Looking Back, Looking Ahead, and Thank You for the Honor of Serving CSTA* ([blog.acm.org/archives/csta/2014/05/looking\\_back\\_lo.html](http://blog.acm.org/archives/csta/2014/05/looking_back_lo.html)) will most certainly want to read it. Chris details the CSTA milestones during the past 10 years and takes a brief look toward the future. It is quite appropriate that Chris credits our CS educators as the "true agents of change." Throughout her 10 years, Chris has been the true advocate for CS educators and CS education.

Chris' efforts and leadership in CSTA have made a positive impact on so many of our members. Several members have shared their memories and thoughts of Chris.

"Chris is a wonderfully articulate leader, notable for her ingenuity, selflessness, brilliance, and patience. I don't know of another person who could have brought together so many spirited and talented educators and empowered them the way Chris has. It has been an honor working on projects with her. I've not only been able to further our cause, but I've also grown so profoundly as an educator, as a leader, and as a person. Chris Stephenson is a natural born CS education advocate; even her initials are CS :)"

— Daniel Moix,  
CS educator, Arkansas

"Chris Stephenson is a kind, intelligent, and generous person. She has made CSTA what it is today. As a visionary and

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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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a leader, Chris has been a great friend, supportive mentor, and trusted guide to many, many teachers. Thank you for being my friend, mentor, and guide."

— **Deepa Muralidhar**,  
CS educator and chapter leader, Georgia

"At my first SIGCSE conference, Chris asked me why I hadn't run for the CSTA Board. When I told her that I didn't think I had done enough for the community yet, she put her arm around my shoulders, told me why she thought I should run, and then made me promise that I would run the next year. She's that kind of person—encouraging, supportive and positive!"

— **Tammy Pirmann**,  
CSTA Board member, CS educator, and chapter leader, Pennsylvania

"Chris Stephenson has impacted my commitment, education, and role in CS

education. She is my super hero, my number-one role model. She has transformed and inspired me, and encouraged me to join her team as a chapter and state leader. She has touched so many educators and has helped all of us find our way in our local states and in schools. She has been our personal coach, our teacher, our mentor. I feel honored to know her!"

— **Kelly Powers**,  
CS educator, CSTA Greater  
Boston Co-President

CSTA will certainly miss Chris' leadership as the CSTA Executive Director, but we look forward to continuing our relationship as we all work to advance CS education. Thank you, Chris, for paving the path for CSTA's work in ensuring that CS education is growing and thriving in our schools. Best wishes and congratulations from all of CSTA!

## CSTA – What a History!

Pat Phillips

CSTA EXISTS BECAUSE OF THE WORK of a great many people and the support of computer science (CS) educators the world over who understand the importance of K-12 CS education. Ten years on and more than 16,000 members later, CSTA is a reality and a force to be reckoned with because of their vision and work.

ACM launched CSTA in 2004 as a result of recommendations from the ACM K-12 Task Force. This Task Force had taken on a number of critical projects, including the launching of the annual Computer Science and Information Technology Symposium and the development of the *ACM Model Curriculum for K-12 Computer Science*, which was created by a committee led by Allen Tucker. The committee felt, however, that supporting and improving K-12 CS education would require something that all other disciplines except CS already had—a professional organization for K-12 practitioners.

In November 2003, Chris Stephenson and ACM Director of Membership, Lillian Israel, put together an official proposal for the ACM Executive Council. With tremen-

dous support from ACM Chief Operating Officer Patricia Ryan and Chief Executive Officer John White and from high-level ACM volunteer leaders such as Maria Klawe and Stuart Feldman, the ACM Executive Council agreed to launch CSTA in January of 2004 and to provide funding to hire its first Executive Director. Chris Stephenson was hired as the Executive Director on a part-time basis for the first year, but as CSTA grew and matured, the job was expanded to a full-time position.

Starting in 2003, Chris and Lillian had also begun the search for a strong group of CS educators to form the first CSTA Steering Committee. The group held its first official meeting on October 18, 2003, and included Charmaine Bentley, Robb Cutler, Fadi Deek, Michelle Friend Hutton, Ghada Khoury, Pedro Leite, Greg Halopoff, Lielsi Knaak, Pat Phillips, Eric Roberts, Adam Shaw, Fran Trees, and Anita Verno (many of whom have served CSTA and its members in many capacities over the years). That first meeting was wide-ranging, exploring the current challenges of K-12 CS education and the many *continued on page 4*



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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.

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

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Meet the  
New Board Members

[csta.acm.org/About/sub/  
AboutFiles/2014Election.html](http://csta.acm.org/About/sub/AboutFiles/2014Election.html)

## CSTA – WHAT A HISTORY!

*continued from page 3*

projects that CSTA might take on, and it set the tone for all future gatherings of CSTA's leadership. In February of 2004, with CSTA officially launched, Chris Stephenson drafted the first CSTA by-laws, which were then approved by the Steering Committee and by ACM's legal advisors.

At its second meeting, March 4, 2004, the CSTA Steering Committee set up a number of working committees that are still in operation today. By then, there were also several ongoing projects, including the Java Engagement for Teacher

transitioned to Chair of the CSTA Board of Directors and Robb's original passion and commitment to the leadership of CSTA have been carried on by Michelle Friend Hutton, Steve Cooper, and currently, Deborah Seehorn. Some of the original Steering Committee members continue to serve CSTA, including Fran Trees as Chapter Liaison and Pat Phillips as Editor of the *CSTA Voice*. And many other leaders in CS education have contributed their time to the CSTA Board and to its many committees and activities.

Over the years, many of CSTA's germinal projects have become integral to CSTA and its ability to serve its teacher members.

Training (JETT) program (also generously funded by ACM), which was working in partnership with universities across the country to help teachers get ready for the Advanced Placement exam shift from C++ to Java, and the annual symposium. Robb Cutler had also set up the first CSTA Web-board. In anticipation of opening up CSTA for general membership in September of 2004, ACM had also begun working with CSTA to create a membership database with an online join form. A logo had also been developed.

By November 2004, CSTA had begun moving toward a more formal leadership structure. Robb Cutler generously volunteered to serve as CSTA's first President, and other representative positions as described in the by-laws were formalized as the organization began the transition to a fully elected Board of Directors. In December of 2004, the CSTA Advisory Council was also launched with the participation of a number of august academic and industry representatives, many of whom have continued to provide invaluable guidance and support to CSTA through the years. In April 2005, CSTA launched the inaugural issue of the *Voice*, CSTA's flagship member publication. In early 2006, CSTA launched its regional chapter program and by May of 2006, there were already six chapters.

The role of CSTA President has now

In addition to ACM, which continues to support CSTA both financially and with vital staff resources in areas such as membership, fiscal services, and benefits and payroll administration, other organizations and sponsors have stepped up to support CSTA. CSTA was the recipient of three National Science Foundation grants from 2005-2013 thanks to NSF leaders Peter Freeman, Harriet Taylor, and Janice Cuny. Microsoft, Google, and Oracle have also been generous supporters of CSTA projects, including the CSTA Conference. And many organizations and companies are now partnering with CSTA.

Over the years, many of CSTA's germinal projects have become integral to CSTA and its ability to serve its teacher members. The CS&IT Symposium has transitioned into the Annual CSTA Conference and the legacy of JETT lives on in the many professional development events that CSTA provides each year and in the system of peer-centered professional development that has been adopted by a number of other organizations. CSTA now has more than 16,000 members worldwide, and in 2014 we surpassed 50 CSTA regional chapters, including four in Canada. CSTA has also assisted in the formation of new organizations serving CS teachers in other countries, including Great Britain and New Zealand.

This is not to say that everything has

been smooth sailing along the way. In the early days there was much disagreement regarding the name of the organization (*computer science teachers, computer teachers, or computing teachers*). CSTA also faces the ongoing challenge of being fiscally sustainable while trying to be a change agent that engages and supports all CS teachers without fiscal barriers.

Ten years ago, when the ACM Executive Council took a chance and formed the first CS practitioners' organizations for K–12, it was something of an act of faith, as there really was no telling if CSTA would succeed. But succeed it has! And may its next ten years be just as exciting and just as full of promise as the teachers and the discipline it serves.

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## Computer Science Information and Resources at Your Fingertips

**FINDING RESOURCES** for classroom use, advocacy work, and professional development is a challenge computer science (CS) educators have reported they face in the *CSTA National Secondary Computer Science Survey*. CSTA is happy to be part of the solution by providing quality resources and making them readily available from the website.

Here are a few of the most popular:

**Advocacy Tools** In this collection you will find presentations, toolkits, and supporting information to help inform parents, fellow educators, administrators, and state legislators about the importance of CS education for everyone ([csta.acm.org/Advocacy\\_Outreach/sub/AdvocacyTools.html](http://csta.acm.org/Advocacy_Outreach/sub/AdvocacyTools.html)).

**Big News!** This section of the CSTA home page offers a quick glimpse at the latest CSTA news, including links to recent blog articles, newly posted resources, and your very own CSTA badge ([csta.acm.org](http://csta.acm.org)).

**CSTA Chapters** Here you will find information on CSTA chapters within your state and leader contact information as well as details for starting a chapter ([csta.acm.org/About/sub/CSTAChapters.html](http://csta.acm.org/About/sub/CSTAChapters.html)).

**Computer Science Begins in K–8** As part of CSTA's commitment to CS education in all grades, this section provides resources that we believe will help elementary and middle school teachers incorporate CS content into their classroom practice in appropriate and engaging ways ([csta.acm.org/Curriculum/sub/CSK8.html](http://csta.acm.org/Curriculum/sub/CSK8.html)).

**CSTA Annual Conference** The conference micro-site contains information on CSTA's current Annual Conference, including upcoming deadlines, submission details, the agenda, and speaker information. Links to past conference videos and handouts are also available ([www.cstaconference.org](http://www.cstaconference.org)).

**The Advocate Blog** In addition to advocacy strategies, educators will find information on best practices, the latest news and trends in K–12 CS education, and practical tips for the classroom ([blog.acm.org/csta](http://blog.acm.org/csta)).

**CSTA Job Board** As one of the newest features on the CSTA website, the Job Board is specifically customized for the needs of CS educators. Job hunters can search for CS education career opportunities and institutions can create profiles, post job openings, and search educator resumes ([csta.acm.org/ProfessionalDevelopment/sub/JobBoard.html](http://csta.acm.org/ProfessionalDevelopment/sub/JobBoard.html)).

**CSTA K–12 Computer Science Standards** This document delineates a core set of learning standards designed to provide the foundation for a complete CS curriculum and its implementation at the K–12 level ([csta.acm.org/Curriculum/sub/K12Standards.html](http://csta.acm.org/Curriculum/sub/K12Standards.html)).

If you haven't explored the CSTA website lately, it's worth visiting again to discover the wealth and variety of resources created and selected to meet your needs as a member and as an educator.

## Meet the Authors

### Lien Diaz

*Sr. Director, AP Program,  
College Board*

Lien is the Sr. Director of Advanced Placement (AP) Curriculum and Content Development in the AP Program. She is also co-Principal Investigator for *Broadening Participation in Computer Science: AP Computer Science Principles Phase II*.

### Tammy Pirmann

*School District Representative,  
CSTA Board of Directors*

Tammy is the K–12 Coordinator for Computer Science at the School District of Springfield Township in Montgomery County, PA, as well as a high school computer science teacher. She also serves as the chair of the CSTA Membership Committee.

### Pat Phillips

*Editor, CSTA Voice*

Pat is a retired computer science teacher and currently works as an educational consultant, technology education writer, and project manager.

### Deborah Seehorn

*Chair, CSTA Board of Directors*

Deborah has worked as a Business, Finance, and Information Technology Education consultant at the North Carolina Department of Public Instruction for 15 years. She has taught mathematics, business, and computer programming. She previously served as the State Department Representative on the CSTA Board of Directors.

### John R. White

*CEO, ACM*

John has served as CEO of ACM since 1999. Prior to ACM, John was manager of the Computer Science Laboratory at Xerox PARC and previously a professor of computer science at the University of Connecticut.

## Spotlight

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*Ten Years of CSTA: A Very Good Thing from ACM's Perspective*

**John R. White**

ACM nurtured the launch of CSTA 10 years ago. It did so because ACM was committed to seeing a healthy educational pipeline in computer science (CS) at every level—K through 12, post-secondary, and graduate. ACM's mission is to advance computing as a science and profession. Advancing computing as a science demands ACM do everything it can to ensure CS exists as a real, visible, and recognized discipline—with related curriculum and learning standards, credentialing and professional development, and an established presence in the educational system in the U.S.

As the 21<sup>st</sup> century began, ACM was increasingly concerned about the state of CS education in K–12, particularly in U.S. high schools. CS had emerged onto the high school landscape in the 1980s. There were CS courses, curriculum guidelines, and even Advanced Placement (AP) courses and tests. All seemed well and headed in the right direction.

Over the next 20 years, as computing became more ubiquitous, there was a shift away from “real” CS education in high schools to education programs focused on learning how to use the technologies that were exploding onto the scene. The term “computer science” was still around, but it frequently meant “IT literacy.”

Under the presidency of Maria Klawe, the ACM Executive Committee established a K–12 Task Force in CS to look at the issues that plagued CS education in K–12, to take on tasks that could help build a foundation for real CS to exist in, or return to, U.S. schools, and to make recommendations. One of the key recommendations made was to launch a national professional society for K–12 CS teachers.

Chris Stephenson led the effort to build the proposal for a Computer Science Teachers Association and lobbied the ACM Executive Committee to make it happen. Chris really made a difference here and taught ACM leadership a fundamental principle: no one can speak, think, or act on behalf of CS teachers but CS teachers. It was clear. Fulfilling ACM's mission required ACM to establish CSTA. It did and hired Chris Stephenson as the Executive Director.

Over the intervening decade, CSTA has become a significant and influential organization. Many, many people have played key roles in the evolution and growth of CSTA, but none more key than Chris ... from insisting that the organization be called the Computer Science Teachers Association (not the Computing Teachers Association) ... to ensuring CSTA produced and owned fundamentally important reports on curriculum, standards, teacher certification, and education policy ... to growing CSTA membership and chapters ... to ensuring everyone realized teachers needed to be a part of every conversation regarding K–12 CS education.

This latter point—if you are talking CS education, CS teachers need to be a part of the conversation—meant that CSTA, even when it was a nascent organization boot-strapping itself into existence, needed to be at the table, and it was. As a result, CSTA has fundamentally shaped the last ten years of K–12 CS education in the U.S. CSTA has been integral to ACM's Education Policy efforts to advocate for real CS to exist and count in the U.S., shaped the K–12 Alliance agenda of the National Center for Women and Information Technology, influenced the emergence of new courses in CS – Exploring Computer Science (ECS) and CS Principles, helped ACM

launch CS Education Week, and has been a key player in major programs of *Code.org*.

ACM's support of, and commitment to, CSTA has been a well-placed investment. CS education is making its way back into the mindset of the U.S. secondary education system. Without CSTA this never would have happened.

## Research Update

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*State-by-State Analysis of CS Education*

**Tammy Pirmann**

Every two years, CSTA surveys high school computer science (CS) teachers in an effort to measure schools' responses to the changing landscape in CS education. The results of this survey, the *National Secondary Computer Science Survey*, are posted on the CSTA website ([csta.acm.org/Research/sub/HighSchoolSurveys.html](http://csta.acm.org/Research/sub/HighSchoolSurveys.html)). You will find a document showing the changing national trends over the years, as well as an interactive U.S. map from which you can easily locate the results from individual states (if there were sufficient respondents).

By comparing the data state to state, some interesting details come to light. It is important to note that the percentages are based upon the number of schools represented by the survey respondents. The percentages do not reflect all schools in the entire state.

### Introductory (or Pre-AP) CS Courses

In the U.S. as a whole, introductory CS courses are offered in 74% of the respondents' schools. However, 100% of Utah and Wisconsin respondents reported that their schools offer introductory CS, while only 53% of the respondents in North Carolina and Missouri reported that their schools offer such a course. Other states with high percentages include Michigan, Indiana, New Jersey, and New Hampshire (89-92%). Other states with low percentages include Oklahoma and Georgia (55-59%).

Computing (40%) and technology (46%) are the most common types of credit earned for introductory CS courses nationally in the respondents' schools, but it was reported that 75% of respondents' schools in North Carolina award business credit, 67% of respondents' schools in Utah award math credit, and 18% of respondents' schools in Alabama award science credit for introductory CS courses.

CS educators have a variety of programming languages from which to choose for introductory CS courses. Nationally, as reported by survey respondents, Java is the most common language (49%), followed by Scratch (34%), with Alice and Visual Basic tied for third (30%). However, Scratch is the most prevalent language in Georgia and Washington, and Alice is the most common language in Wisconsin. Visual Basic is most popular in Indiana and Missouri. Python is prevalent in New Hampshire and something else (other) is most popular in California.

### Advanced Placement Courses

The new Computer Science Principles (CSP) course has certainly received a lot of press within the CS education community. Nationally, our respondents reported that 38% have plans to offer CSP at their schools, but another 38% are not even aware of the course. Respondents in Alabama are most interested in this course (67%); those in Indiana, Connecticut, Georgia, and Maryland are also very interested (50-55%). Respondents in Kansas are the least aware of the new course

(73%), along with Oklahoma and New Hampshire (58-67%). We hope to see the numbers indicating awareness of and plans to offer CSP increase in the 2015 survey as information regarding the new course continues to be shared with teachers across the country.

Nationally, 46% of responding teachers said that their schools offer the AP CS A course, but the range is dramatic. Respondents in Maryland reported that 79% of their schools offer AP CS A, followed by respondents in Washington (67%) and Texas (66%). Lower percentages of schools offering AP CS A were reported in Kansas (6%), Oklahoma (28%), and Ohio (33%).

### Challenges of Teaching CS

Despite the need for citizens to have CS knowledge and a plentiful job market for graduates with CS-related skills, U.S. teachers continue to encounter low enrollments and other challenges. Eighty-seven percent of respondents judged that their schools had “students who should be taking or would like to take” a CS course but are not doing so. The range is only from 71% (North Carolina) at the lowest to 100% (Washington, Utah, and Missouri).

Educators face a variety of challenges in teaching CS. Presented with a list of eight specific challenges, respondents rated these three significantly higher than the rest:

- Lack of student interest/enrollment
- Lack of support/interest by school staff
- Rapidly-changing technology

While for most states the top two reported challenges were within this list of three, there were some interesting exceptions. “Lack of hardware and software resources” was among of the top two challenges for respondents in Alabama, while “Lack of curriculum resources” was a critical challenge for teachers in Alabama, Utah, and Washington. “Lack of teacher subject knowledge” was one of the top two challenges for respondents in Kansas and North Carolina. “Lack of student subject knowledge” was the top challenge in Maryland, North Carolina, and Virginia. The top challenge in California, New York, Virginia, and Washington was “Difficult subject matter.”

Full survey results, including details from individual states (accessible through a clickable map), are available on the CSTA website ([csta.acm.org/Research/sub/HighSchoolSurveys.html](http://csta.acm.org/Research/sub/HighSchoolSurveys.html)).

## Curriculum in Action

### Big Idea: Data and Information

AP CS Principles

Lien Diaz

The new Advanced Placement Computer Science Principles (CSP) course offers a comprehensive spectrum of big ideas (or themes) in its curriculum framework. This article serves to provide a few more details about one of the AP CSP big ideas: Data and Information.

Data and Information is defined as understanding how computation with large data sets has contributed to new information and knowledge shared in today’s society. The notion that data and information facilitate the creation of knowledge is monumental in the study of CS. In support of this view, the AP CSP Curriculum Framework delineates three enduring understandings for this big idea. The purpose of the enduring understandings is to summarize important ideas that are central to the study of data and information in this course and have lasting value beyond the classroom. Enduring Understandings for the AP CSP big idea Data and Information are:

- People use computer programs to process information to gain insight and knowledge.
- Computing facilitates exploration and the discovery of connections in information.
- There are trade-offs when representing information as digital data.

For each of these enduring understandings, the curriculum framework outlines specific student expectations, or learning objectives. The number of learning objectives varies, depending on the scope of each enduring understanding, and they specify what students are expected to do in the course. Below is an outline of the enduring understandings and learning objectives for Data and Information.

### People use computer programs to process information to gain insight and knowledge.

Students are expected to:

- Use computers to process information, find patterns, and test hypotheses about digitally processed information to gain insight and knowledge.

*continued on page 8*

## Recognition of a Job Well Done

Congratulations and thank you to the outgoing CSTA Board members

**Steve Cooper**, *Past Chair*

**Stuart Reges**, *University Faculty Representative*

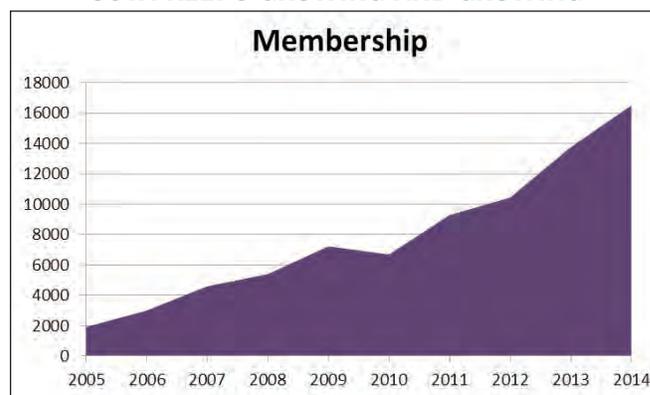
**Joanna Goode**, *Teacher Education Representative*

**Valerie Barr**, *Computational Thinking Task Force Chair*

**Michelle Lagos**, *International Representative*

**Karen Lang**, *Teacher Representative*

## SHOW ME THE NUMBERS CSTA KEEPS GROWING AND GROWING



We're on the Web: [csta.acm.org](http://csta.acm.org)  
Like our Facebook page!

## BIG IDEA: DATA AND INFORMATION

*continued from page 7*

- Collaborate when processing information to gain insight and knowledge.
- Explain the insight and knowledge gained from digitally processed data by using appropriate visualizations, notation, and precise language.

### Computing facilitates exploration and the discovery of connections in information.

Students are expected to:

- Extract information from data to discover and explain connections, patterns, or trends.
- Use large data sets to explore and discover information and knowledge.

### There are trade-offs when representing information as digital data.

Students are expected to:

- Analyze how data representation, storage, security, and transmission of data involve computational manipulation of information.
- Through their study of data and information, AP CSP students will learn how computation helps people process data and information. They will consider trade-offs in the computational manipulation of data, and they will have the opportunity to work with large data sets to solve meaningful problems and create new knowledge.

The CSP course defines six big ideas in addition to Data and Information. They are:

- Creativity: fostering the creative aspect of computing that enables development of computational artifacts to solve a problem and impact society;
- Abstraction: reducing information and detail to manage complexity and communicate with people and machines;
- Algorithms: using algorithms in analytical and empirical ways to build computational artifacts and solve problems;
- Programming: developing and using software effectively, translating human intention into computational artifacts;
- Internet: gaining insight into how the Internet operates to analyze important concerns such as cybersecurity; and
- Global Impact: studying the ways computing has impacted how we communicate, collaborate, solve problems, and conduct business, all of which are essential to thrive in many careers.

## Keep up with CSTA!

The CSTA conference, advocacy efforts, CS education news, chapter events—you name it and you'll find it on Twitter (@CSTeachersA and #csta14), Facebook (Computer Science Teachers Association), and, LinkedIn.

***Join the conversation with the connection of your choice.***

## MARK YOUR CALENDAR

### 2014 CSTA Annual Conference

July 14–15, 2014, St. Charles, Illinois  
[cstaconference.org](http://cstaconference.org)

### National CS Principles Education Summit

July 16, 2014, St. Charles, Illinois and virtually  
[csta.acm.org/ProfessionalDevelopment/sub/CSPSummitAgenda.pdf](http://csta.acm.org/ProfessionalDevelopment/sub/CSPSummitAgenda.pdf)

### Edugaming Conference 2014

August 4–5, 2014, Schnecksville, Pennsylvania  
[www.edugamingconference.com](http://www.edugamingconference.com)

### Consortium for Computing Sciences in Colleges (Midwestern)

September 19–20, 2014, Bourbonnais, Illinois  
[www.ccsc.org/midwest/conference](http://www.ccsc.org/midwest/conference)

### Consortium for Computing Sciences in Colleges (Northwestern)

October 10–11, 2014, Spokane, Washington  
[www.ccsc.org/northwest/2014](http://www.ccsc.org/northwest/2014)

### Consortium for Computing Sciences in Colleges (Rocky Mountain)

October 10–11, 2014, Denver, Colorado  
[www.ccsc.org/rockymt](http://www.ccsc.org/rockymt)

### SIGITE and RIIT

October 15–18, 2014, Atlanta, Georgia  
[sigite.org/?page\\_id=504](http://sigite.org/?page_id=504)

### Mobilize Data Science Workshop

October 18, 2014, Seattle, Washington  
Contact: Greg Kilpatrick, [kilpatrick@csta.acm.org](mailto:kilpatrick@csta.acm.org)

### Consortium for Computing Sciences in Colleges (Southeastern)

November 7–8, 2014, Charleston, South Carolina  
[www.ccscse.org](http://www.ccscse.org)

### Consortium for Computing Sciences in Colleges (Eastern)

November 14–15, 2014, York, Pennsylvania  
[www.ccsc-eastern.org](http://www.ccsc-eastern.org)

Check the most recent CSTA events on the CSTA website [csta.acm.org/ProfessionalDevelopment/sub/TeacherWorkshops.html](http://csta.acm.org/ProfessionalDevelopment/sub/TeacherWorkshops.html)  
List your CSTA event by contacting [l.clayborn@csta-hq.org](mailto:l.clayborn@csta-hq.org)

## 2014 CSTA Annual Conference

July 14–15 in St. Charles, Illinois  
[www.cstaconference.org](http://www.cstaconference.org)