AP Computer Science: Present State and Future Directions
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Agenda

• Why a New AP CS Course?
• What’s Going On?
• Why CSTA Cares?
• What will CSTA Do?
Why A New AP?
The Future Workforce -- The High School Pipeline:
AP Mathematics and Science Exams 1997-2007

Source: College Board Exam Volume Data
Female Participation in AP Science Tests

1997 and 2007 Participation Rates

National School Enrollment and APCS Exam Participation by Race and Gender

- Enrollment
- APCS Exams

<table>
<thead>
<tr>
<th>Race</th>
<th>Enrollment</th>
<th>APCS Exams</th>
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<td>1.3%</td>
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<tr>
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<td>3%</td>
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<td>57%</td>
<td>67%</td>
</tr>
<tr>
<td>Female</td>
<td>49%</td>
<td>15%</td>
</tr>
<tr>
<td>Male</td>
<td>51%</td>
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We Need A More Engaging Course

• The numbers tell a very clear story about how we are failing to engage young women and minority students. This isn’t just an equity issue, it is a survival issue.

• Kids believe that taking the CS AP course will drag their GPA’s down even though the content is just as rigorous in other AP courses that they are taking in droves.

• The current AP exam has become a gatekeeper, keeping students out of the discipline because:
  — It was designed as a college level course
  — It was never meant to be the first CS course a student ever takes
  — It sets students up for failure and convinces them that CS is not the field for them
  — The focus on Java and OO programming have made it highly language(syntax)-centric
  — It does very little to demonstrate the breadth and excitement of computer science
Why CSTA Cares
CSTA’s Mission

• The Computer Science Teachers Association is a membership organization that supports and promotes the teaching of computer science and other computing disciplines. CSTA provides opportunities for K-12 teachers and students to better understand the computing disciplines and to more successfully prepare themselves to teach and learn.
CSTA’s Goals and Objectives

Creating a community of individuals and organizations working together to address critical issues in K-12 computer science education.

**Promote a Better Understanding of Computer Science:** Provide visibility, influence policy, and generate resources that illuminate computer science as an essential academic discipline.

**Develop Research and Resources:** Conduct original research and serve as a direct-to-practitioner channel for the dissemination of research and resources that address current knowledge gaps.

**Support National Standards:** Facilitate the implementation of national curriculum and teacher certification standards to support consistent excellence in learning and teaching.

**Support Teacher Excellence:** Provide multiple levels of professional development to improve teachers’ technical knowledge and pedagogical skills.

**Opportunities:** Promote computer science as a field of study and as a career destination that provides a wealth of opportunities to students regardless of their gender, race, or socio-economic status.
Systemic Issues

- Unless we increase the number of students taking high school CS, our enrollments will continue to languish at the post-secondary level (this generation is not our generation)

- Because CS is an elective and not a core course, kids are going to have trouble fitting this course into their timetables

- States are increasing the number of math and science credits students must have in order to graduate, reducing the chances that students can/will take elective courses

- Until college admissions take computer science seriously, high school students, guidance counselors, and administrators will not
Things We Do and Do Not Need

• We need to prove that CS is a relevant and interesting discipline with connections to other fields

• We need to establish that computer science is a science and not a technology

• We need to make what and how we teach connect with kids today (they don’t hate hard work, they hate boredom and irrelevance)

• We need a sensible, age level appropriate series of courses that students can take and that colleges and universities can depend upon to be consistent and rigorous

• We do not need to drag in teachers from other disciplines—there are approximately 36,000 computer science, APCS, and programming teachers in the U.S. right now and we need to prepare them for these new courses
What’s Going On?
Background

• Last year the College Board announced that they were eliminating the AP CS AB exam, leaving only the AP CS A exam

• The AP CS A exam continued to be reviewed and updated based on these changes and previous issues with regard to exam content

• There was a growing community of people who felt that the current exam choices did not meet the needs of the community or reflect the diversity of our potential students

• The National Science Foundation’s Broadening Participation in Computing program was becoming a key player in issues relating to K-12 CS (both formal and informal) education
The Current Players

• The AP CS Development Committee:
  — setting and reviewing the content specifications for the test and helping to decide on the types of questions to be used
  — making suggestions for research studies that will help the committee work more effectively and/or lead to improvements in the program
  — writing questions; reviewing questions
  — assembling tests; reviewing tests and test results
  — reviewing material for publication
• The AP CS Development Commission:
  — Developing the big ideas for the *AP CS Principles* course
  — Developing the key concepts the *AP CS Principles* course
  — Developing the supporting concepts the *AP CS Principles* course
  — Developing the practices for the *AP CS Principles* course
  — Developing the claims and evidence for the *AP CS Principles* course
The Current Players cont.

• The AP CS Advisory Committee:
  – Advising the Commission on the big ideas of the new *AP CS Principles* course
  – Advising the Commission on the supporting concepts
  – Providing key feedback on whether students would receive credit or placement for successful completion of the exam based upon the contents of the new AP CS Principles course
Where the Commission is Now

- Developed and revised big ideas
- Developed and revised key concepts
- Developed and revised supporting concepts
- Revising Skills and Practices document
- Working on claims and evidence
What Will CSTA Do?
CSTA’s Role

• Work with the Review Commission and NSF to help create a new introductory CS AP that is part of a sensible progression of learning opportunities

• Provide expertise and guidance on the curriculum development and implementation process

• Continue to promote curriculum standardization at the high school level

• Work to make sure current teacher certification requirements are revised to ensure that teachers are adequately and appropriately prepared
CSTA’s Role continued

• Work at the state level to have CS classified as a math or science credit for graduation purposes

• Commit its professional development efforts to helping prepare teachers to teach high school computer science

• Provide resources to help colleges and universities promote computer science as an educational pathway and career

• Talk to people until their eyes roll back in their heads about how important it is to address this issue now

• Whatever you need us to do to help
Contact Information

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