CS 10K Project

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The computing community faces three significant and interrelated challenges in workforce development.

• Underproduction of degrees
• Underrepresentation
• Lack of a presence in K-12
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Projected Annual Underproduction

United States: Number of Degrees Earned in CIS vs. Projected Average Annual Number of Computing Job Openings

144,500 Average Annual Openings
88,161 Annual Degrees Earned

- 1,340 Doctoral
- 17,312 Master's
- 39,701 Bachelor's
- 29,808 Associate's

Sources:
- Completed Degree Data, Computer and Information Sciences, 2007-08 National Center for Education Statistics.

ncwit.org

11/10/11
% Intended CS majors

Data source: HERI, Slide: NCWIT
• Underproduction of degrees
• Underrepresentation
• Lack of a presence in K-12
2010 AP Gender Gap

- Statistics: 49% Female / 51% Male
- Calculus: 58% Female / 42% Male
- Computer Science: 19% Female / 81% Male
- Biology: 51% Female / 49% Male

—College Board, 2010
Female % of STEM Undergrads


ncwit.org/scorecard
In 2010, underrepresented minorities

– Received just 10.6% of the bachelor degrees, 4.8% of the masters, and 3.6% of the PhDs.

– Only 49 of 1,620 Ph.D.s were awarded to African Americans or Hispanics.

—CRA Taulbee Survey, 2011
• Underproduction of degrees
• Underrepresentation
• Lack of a presence in K-12
  • No research base
  • Not taught in most schools
The percentage of U.S. high school students taking STEM courses has increased over the last 20 years for all STEM disciplines except computer science, where participation dropped from 25% to 19%.

—2009 NAEP High School Transcript Study
High School Participation in AP STEM Disciplines

Seniors, in 2010:
- 194,784 took AP calculus
- 134,871 took AP biology
- 109,609 took AP statistics
- 14,517 took AP CS A

—Data: College Board, 2010 Slide: CSTA
High School is the key to both underproduction and underrepresentation.
CS 10K Project

Develop effective new high school computing curricula and get that curricula into courses taught in 10,000 schools by 10,000 well-prepared teachers by 2015.

CS Principles (AP)
Why AP?

• Often the only CS course that carries college prep credit
• Attractive to students & schools
• 2,000 CB-audited teachers
• Single point of national leverage
• Fidelity of replication
CS Principles

• Engaging, accessible, inspiring, rigorous
• Focused on the fundamental concepts of computing (CT)
Timeline

2009-2010
  ✔ Course framework

2010-11
  ✔ Pilot I: Five colleges
  ✔ College Survey
  ✔ College attestation/support
  ✔ 2011-12
  – Pilot II: Official & Unofficial
ECS & CS Principles Pilot Sites 2011-12
CS 10K Project

- Additional course curricula, materials, models
- Standards & assessments
- Teacher preparation $\times 10,000$
- Entrée into schools

Beyond NSF’s mission and resources
What all do we need?

• CS Standards
• Changes in teacher certification
• Changes in the crediting of CS courses
• CSTA Chapters
• Pre- and in-service teacher training
• Ongoing teacher support
NSF Can’t do this alone: It will take the Community

— Academic departments at universities and community colleges

— Individuals
  Faculty, undergraduates, graduate students, teachers, guidance counselors, parents, IT professionals

— Companies and Foundations
  Public/Private Partnership
Thanks!

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