CS 10K:
Why is Computing Different?
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Computing is everywhere. It’s transforming our lives.
The computing community in the U.S. faces three significant and interrelated challenges in maintaining a robust IT workforce.

1. Underproduction
2. Underrepresentation
3. Lack of a presence in K-12 education
Computing is significantly under producing postsecondary degrees

United States National Computing Data

Comparison of CIS Degrees Earned Nationally and Projected Average Annual Computing Jobs

Projected job openings that could be filled by computing degrees: 61%

Education Indicators

AP Computer Science Test-takers
2009: 21,727

Degrees Earned in Computer and Information Sciences
2007-2008 Academic Year
Associate's: 29,808
Bachelor's: 39,701
Master's: 17,312
Doctoral: 1,340

Projected Workforce Indicators (2008-2018)

Average Annual Computing Job Openings: 144,500
10-year Percent Change in Computing Jobs: 22.19%
10-year Change in Number of Computing Jobs: 745,700

Data: BLS and NCES; Slide: NCWIT
And they’re good jobs going unfilled.
Computing has a long standing, significant underrepresentation of women at the high school level.

—Credits: Top NCWIT, Bottom College Board
Computing not drawing top math achievers

**TOP 10 AVERAGE SAT MATH SCORES BY INTENDED MAJOR, 2009**

<table>
<thead>
<tr>
<th>Major</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math/Statistics</td>
<td>613</td>
</tr>
<tr>
<td>Multi-disciplinary Studies</td>
<td>594</td>
</tr>
<tr>
<td>Physics</td>
<td>592</td>
</tr>
<tr>
<td>Engineering</td>
<td>582</td>
</tr>
<tr>
<td>Biology</td>
<td>557</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>550</td>
</tr>
<tr>
<td>Undecided</td>
<td>549</td>
</tr>
<tr>
<td>Foreign Lang/Lit</td>
<td>545</td>
</tr>
<tr>
<td>Philosophy and Religion</td>
<td>543</td>
</tr>
<tr>
<td>Computer/Info Sciences</td>
<td>533</td>
</tr>
</tbody>
</table>

That underrepresentation of females carries over to incoming college first-year students.

PERCENTAGE OF AMERICAN FRESHMEN INTENDING TO MAJOR IN COMPUTER SCIENCE: A LONGITUDINAL LOOK


Data source: HERI, Slide: NCWIT
The underrepresentation of women in computing continues throughout college.
What about students with disabilities?

Undergraduate students, by majors and by disability status: 2004

- Natural sciences and engineering:
  - No disability: 18%
  - With disability: 18%

- Social/behavioral sciences:
  - No disability: 9%
  - With disability: 9%

- Humanities:
  - No disability: 13%
  - With disability: 14%

- Health:
  - No disability: 16%
  - With disability: 16%

- Education:
  - No disability: 9%
  - With disability: 8%

- Business:
  - No disability: 20%
  - With disability: 19%

- Other nonS&E:
  - No disability: 15%
  - With disability: 17%

People with disabilities in IT

• 11% of the population in school, ages 14-21, have disabilities.
• 13% of undergraduate IT majors have disabilities.
• 5% of graduate IT majors have disabilities.
• 0.8% of IT doctorates have disabilities.
  – E.g. From 1999-2004 there were 53 in the US.
• 5% of employed IT scientists and engineers have disabilities.
  – As people age, the percentage of disabled in that age group grows.
And computing has a long standing underrepresentation of minorities.

URMs receive just: 10.6\% of undergrad, 4.8\% of master’s, and 3.6\% of Ph.D.s degrees in computing.

—Taulbee Data, 2011
We lose them in college

Black first-year undergraduate students are more likely than other groups to intend to major in computer science

<table>
<thead>
<tr>
<th>First-Year Intended CS Major</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>4.4%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>White</td>
<td>2.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Asian</td>
<td>3.6%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

—HERI Data, 2008
Why does this matter?
Thanks!

Jeff Forbes

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