COMPUTING OCCUPATIONS ARE TOO GOOD AND TOO IMPORTANT TO IGNORE

J. McGrath Cohoon
NCWIT
UVA

Evidence on factors affecting women’s recruitment and retention
WHY FEW FEMALES PURSUE COMPUTING
REASONS FEW WOMEN PURSUE COMPUTING

- Lack of information/misconceptions
- Educational policies allow choices influenced by stereotypes
- Stereotypes reduce confidence and interest
- Little support and encouragement

LACK OF INFORMATION AND MISCONCEPTIONS

Computer science is what? Programming? Keyboarding? Excel spreadsheets?
Few students, parents, or teachers know what computer scientists do
Too many sources misinform and reinforce stereotypes

I don’t wanna sit in front of a computer all day
- Carter 2006
POLICIES ALLOW STEREOTYPE-BASED CHOICE

Carter 2006
Charles & Bradley 2006

STEREOTYPES REDUCE CONFIDENCE AND INTEREST

Cultural belief: Disconnect between “feminine” and “technical”
- Lagesen 2005

Stereotype threat: Fear of confirming negative beliefs about my group
» Hinders performance
» Affects choices and aspirations
» Leads to harsh personal standards, opting out if not met
- Correll 2004
TOO LITTLE SUPPORT & ENCOURAGEMENT

Peers and authorities
» You’re studying what?
» Women need to explain their choice of CS …but men don’t
- Cohoon 2006

Isolation
» Feeling like you do not belong
- Kissinger et al. 2009
PERSONAL ACTIONS

Actively recruit using messages that reach, inform, and appeal to females
Use pedagogies that spark interest and build peer support
Personally encourage; explain that effort increases ability; mentor

ACTIVELY RECRUIT FROM THE UNDERUTILIZED MAJORITY

College Student Demographics, 2009

- white & asian men: 31%
- UR students: 69%
USEFUL MESSAGES FOR RECRUITING WOMEN & MINORITY MEN

GREAT CAREER! BEST JOBS IN AMERICA 2011

1. Software Engineer
2. Mathematician
3. Actuary
4. Statistician
5. Computer Systems Analyst

According to CareerCast
THREE OF THE TOP TEN OCCUPATIONS ARE COMPUTING

- Systems Engineer: Manage large complex projects
- IT Project Manager: Plan, organize, and oversee the team on a computing project
- Network Security Consultant: Protect important computer systems from infiltration

Source: CNNMoney.com, Best Jobs in America, 2011

COMPUTING OFFERS EXCITING WORK THAT AFFECTS OUR WORLD AND THE PEOPLE IN IT

Create technology for

- Tracking endangered dolphins
- Mobile forensics labs for instant analysis at crime scenes
- GPS systems that guide blind people
- Scanning DNA for childhood diseases
- Designing and displaying new fashions

Source: dotdiva.org
COMPUTER SCIENTISTS GIVE BACK TO THEIR COMMUNITIES

Lisa Rau founded Confluence as a technical resource to the nonprofit sector. She serves on boards and encourages a spirit of volunteerism.

COMPUTER SCIENTISTS WORK IN EVERY INDUSTRY

Source: dotdiva.org
EXCELLENT JOB OPPORTUNITY EXPECTED

Occupations with the Most Predicted Job Openings (in thousands) typically requiring a Bachelor's Degree, but no experience or on-the-job training, 2010-2020

<table>
<thead>
<tr>
<th>Occupation</th>
<th>From Growth</th>
<th>From Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountants and auditors</td>
<td>600</td>
<td>400</td>
</tr>
<tr>
<td>Computer systems analysts</td>
<td>300</td>
<td>200</td>
</tr>
<tr>
<td>Software developers, applications</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Market research analysts and</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Software developers, systems</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Network and computer systems</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Medical and health services</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Computer programmers</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Child, family, and school social</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Graphic designers</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: BLS Occupational Employment Projections to 2020

COMPUTING OCCUPATIONS ARE WELL PAID

Median Annual Wages, 2010

<table>
<thead>
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<th>Occupation</th>
<th>Median Annual Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software developers, systems</td>
<td>$80,000</td>
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<tr>
<td>Software developers, applications</td>
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<tr>
<td>Medical and health services</td>
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<tr>
<td>Computer systems analysts</td>
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<tr>
<td>Computer programmers</td>
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<tr>
<td>Network and computer</td>
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<td>Market research analysts and</td>
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<tr>
<td>Accountants and auditors</td>
<td>$55,000</td>
</tr>
<tr>
<td>Graphic designers</td>
<td>$50,000</td>
</tr>
<tr>
<td>Child, family, and school social</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics (BLS)
Computing offers more jobs than other sci & engr fields

Employment in Major Occupational Groups Projected for 2020, in thousands

- Computer and mathematical occupations
- Architecture and engineering occupations
- Life, physical, and social science occupations

Source: BLS – Employment Projections to 2020

Free resources to learn more and inform others

Statistics about computing education and workforce in your area  www.ncwit.org/edjobsmap
QUESTIONS?