Actively Recruit Women to CS

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We choose occupations based on

- Interest
- Confidence
- Belonging
- Identity
But, stereotype threat inhibits:
- Interest
- Confidence
- Belonging
- Identity

Stereotype threat comes from fear of confirming negative beliefs about my group.
The status quo in computing is that women face stereotype threat so we need to overcome the status quo
<table>
<thead>
<tr>
<th>Interest (Value)</th>
<th>Experiences</th>
<th>Messages</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td>Assignments, Exhibits, Examples, Posters, Open-Houses, Mailings</td>
</tr>
<tr>
<td>Confidence (Efficacy)</td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td>Authority figure, Advisors, Role models, Successful peers</td>
</tr>
<tr>
<td>Belonging</td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
<td>Peers, Environment, Group photos</td>
</tr>
<tr>
<td>Identity</td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td>Businesses, Non-profits, Professional organizations</td>
</tr>
</tbody>
</table>
Go beyond the already interested

Ignite your students’ interest

Experiences | Messages | Delivery
Projects Tied to Interests, e.g., fashion or helping the handicapped
Messages to spark women’s interest

Computing careers offer

» Flexibility: industry, geography
» Socially relevant work
» Collaborate with others
» Time with family
» Job projections
» High salaries
» Satisfied professionals
Sample messages: Computer Scientists work in every industry

<table>
<thead>
<tr>
<th>Role</th>
<th>Industry/Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kendal Sager</td>
<td>Animation/Film</td>
</tr>
<tr>
<td>MaCherie Edwards</td>
<td>Art History/Education</td>
</tr>
<tr>
<td>Gurttina Besla</td>
<td>Astronomy</td>
</tr>
<tr>
<td>Clara Liguri</td>
<td>Communications/Internet Technology</td>
</tr>
<tr>
<td>Shrady Gambaro</td>
<td>Disabilities</td>
</tr>
<tr>
<td>Anamary Leal</td>
<td>Fashion &amp; Design/Computer Graphics</td>
</tr>
<tr>
<td>Claudia Gold</td>
<td>Humanitarian &amp; Disaster Relief</td>
</tr>
<tr>
<td>Tyelisa Shields</td>
<td>Internet Technology/Forensics</td>
</tr>
<tr>
<td>Laura Pfeifer</td>
<td>Medicine</td>
</tr>
<tr>
<td>Malland Lederer</td>
<td>Music/Gaming</td>
</tr>
<tr>
<td>Janelle Tiulento</td>
<td>Poverty &amp; Social Justice</td>
</tr>
<tr>
<td>Sheena Lewis</td>
<td>Public Safety/Poverty</td>
</tr>
<tr>
<td>Yotlan Amaro-Rivera</td>
<td>Public Safety/Medicine</td>
</tr>
<tr>
<td>Angelica Lim</td>
<td>Robotics/Music</td>
</tr>
<tr>
<td>Siobhan Quinn</td>
<td>Social Networking</td>
</tr>
</tbody>
</table>

Source: dotdiva.org
Sample: 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
• Restoring and preserving art work

Source: dotdiva.org
Sample: Computer Scientists give back to their communities

Technology for human rights

• Design secure databases to record human rights abuses while shielding the identities of victims or witnesses

• Create tools that help ordinary people collect extraordinary amounts of money for important causes
Sample: Computing occupations are well paid

Median Annual Wages, 2010

Software developers, systems
Software developers, professional
Medical and health services
Computer systems analysts
Computer programmers
Network and computer
Market research analysts and
Accountants and auditors
Graphic designers
Child, family, and school social

Source: Bureau of Labor Statistics (BLS)
Sample: BLS Projected 2020 Occupational employment for jobs requiring college degree only
Computing Education and Future Jobs: National, State & Congressional District Data

Click on a State or Congressional District for local data. Tips for using the map.

- View resources for improving CS education where you live.
- Read the Report

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
Sample: Best Jobs in America 2012

1. Biomedical Engineer
2. Marketing Consultant
3. Software Architect
5. Database Administrator

Six of top fifteen, based on job opportunity, pay, satisfaction

According to CNNMoney
Deliver consistent messages through
Assignments and examples
Exhibits
Posters
Open houses
Mailings
Advisors can deliver the message
Provide them with up-to-date information
Posters, Speakers, Interesting asides

I develop software for a cochlear implant that will help people who are deaf to hear.

"My day-to-day activities involve collaborating with other scientists and health care professionals, designing new systems, writing code, and testing out new ideas with patients to get their feedback."

Engaging artifacts
Robots saving lives, cute
Go beyond the already confident

Confidence ≠ Ability

Remove stereotype threat and women test better

Good et al. 2008
Build Students’ Skills

Capitalize on existing skills

Scaffold learning
Help students experience success

Use self-affirmation
Credible sources believe in you

I know you can do it!
Highlight current & past student achievements

Display cool projects in public places
Go beyond the clique
Promote belonging

Experiences  
Messages  
Delivery
Be inclusive, not exclusive

Recruit groups

Go where the girls are

» Student government
» Honor societies
» Yearbook
» Sports teams
Be conscious of your language

Your audience is more than “the guys”
Deliver through peers, environment, group photos
Go beyond those already “home”
Help others develop CS identity

They didn’t realize that this is the face of a supercoder

- Student honored by IBM for Mainframe contest
Provide opportunities to “try on” a CS identity

Research experiences
Projects with clubs, classes
Community service
Conference attendance
Poster presentation
Recruiting talks to younger girls
Internships
Team contests
Assign work students they will want to show off
Align CS with other valued identities

Avoid mythbusting, geeks, cubicles, code monkeys, …

» May create stereotypes
» Once implanted, difficult to dislodge

See “How Warnings about False Claims Become Recommendations”  www.acrwebsite.org/topic.asp?artid=250
Deliver via sponsor organizations

E.g., IBM Masters of the Mainframe
NCWIT Award for Aspirations in Computing
Learn more

• Form relationships with other teachers, college instructors, youth leaders

• Join CSTA
• Attend Tapestry
• NCWIT.org
• CS4All
Finally, two example peers

Seth Reichelson
Lake Brantley HS, Florida
300+ in AP CS
40% female

Bob Luciano
Pocono Valley HS, Pennsylvania
55 in Intro to CS
20% female
Remember

Interest
Confidence
Belonging
Identity

Track and report your outcomes so all can benefit from your experience
Mobilizing for Change: NCWIT

Our coalition includes more than 250 universities, corporations, and non-profits.