Fostering Gender Diversity in Computing

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Computing and information technology are among the fastest growing US industries, and participating in efforts to attract and retain a diverse workforce will provide a valuable contribution toward meeting future demands in these professions.

Did you know that in 2009 in the US, 57 percent of all undergraduate degrees, 52 percent of all math and science degrees, 59 percent of the undergraduate degrees in biology, and 42 percent of the undergraduate mathematics degrees were awarded to women (www.ncwit.org/sites/default/files/resources/scorecard2010_printversion_web.pdf)? And did you know that, at that time, only 18 percent of all computer and information sciences undergraduate degrees were awarded to women?

WHAT IS THE PROBLEM?

Why is this important to us? Computing and information technology are among the fastest growing US industries: technical innovation plays a critical role in every sector of the US and global economy, and computing ranks among the top 10 high-profile professions (www.ncwit.org/sites/default/files/resources/scorecard2010_printversion_web.pdf). However, as a nation, we are not prepared to attract and retain the professional workforce required to meet future needs. By 2018, US universities will produce only 52 percent of the computer science bachelor's degrees needed to fill the 1.4 million available jobs (www.ncwit.org/sites/default/files/resources/ncwit_thefacts_rev2010.pdf).

A lack of diverse perspectives will inhibit innovation, productivity, and competitiveness. In addition to failing to attract new and diverse talent, industry is also losing trained professionals who are already interested in technology. While 74 percent of professional women report "loving their work," 56 percent leave at the career "midlevel" point just when their loss is most costly to the company—this is more than double the quit rate for men (www.ncwit.org/sites/default/files/resources/ncwit_thefacts_rev2010.pdf).

WHAT CAN WE DO ABOUT IT?

So what can you do to help ameliorate this situation? This problem extends from K-12 through undergraduate education and on to graduate school and industry. There is no easy solution or quick fix. All segments of the pipeline need attention.

We have developed this special issue to raise your awareness about the diversity crisis in computing. Our goal is to provide you with thought-provoking challenges in the hope that you will be inspired to engage and be more proactive in helping to address this very important topic.

IN THIS ISSUE

This issue includes two cover features from representatives of organizations that are leading efforts to

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diversify the potential workforce and identify what could be done to encourage individuals from underrepresented populations to consider computing as a field of study or a career.

"Diversity in Computing: Why It Matters and How Organizations Can Achieve It," by Wendy M. DuBow from the National Center for Women & Information Technology at the University of Colorado at Boulder, and "Priming the Pipeline: Addressing Gender-Based Barriers in Computing," by Telle Whitney, Denise Gammal, Barbara Gee, Jody Mahoney, and Caroline Simard from the Anita Borg Institute, provide a broad overview of the current situation and outline the strategies these organizations have researched and developed to affect change.

This issue also includes contributions that provide an overview of the pipeline that feeds higher education.

"A Path Between: Mentoring the Next Generation of Computing Professionals," by Mary Fernández of AT&T Labs, illustrates the power of mentoring and describes the success of MentorNet, which matches professionals with undergraduates and graduates in STEM disciplines to help develop the next generation of computer scientists. In "More than Gender: Taking a Systemic Approach to Improving K-12 Computer Science Education," Chris Stephenson of the Computer Science Teachers Association and Rebecca Dovi, who teaches at Patrick Henry High School, Richmond, Virginia, explore the necessity of making access to computer science education equitable across both gender and ethnicities.

Articles by representatives from three schools describe efforts that have been successful in implementing change to increase the number of women in their computer science programs:

- "Broadening Participation: The Why and the How," by Crystal Eney, Ed Lazowska, Hélène Martin, and Stuart Reges, from the University of Washington;
- "Educating Diverse Computing Science Students at the University of Virginia," by James P. Cohoon, J. McGrath Cohoon, and Mary Lou Soffa; and
- "Increasing Female Participation in Computing: The Harvey Mudd College Story," by Maria Klawe.

In addition, some of the people who are actively working to bring more women into computing describe why they choose to spend their time and energy on this effort:

- "Serving Women with a Purposeful Vision," by Deepak Kumar, Bryn Mawr College;
- "Personal Reflections on Gender Diversity in Computing," by Robert B. Schnabel, Indiana University Bloomington;
- "Returning to My Inner Nerd: Following the 'Social' Disruption of Computing," by Kate Starbird, University of Washington;
- "Facing Challenges and Having Fun," by Annie I. Antón, Georgia Institute of Technology; and
- "Pursuing Professional Changes," by Alice Bonhomme-Biais and Raquel Romano, Google.

Their individual stories illustrate what the efforts and passion of individuals like you can do to encourage more women and girls to get excited about computing. The digital version of this issue of *Computer* contains audio interviews with all six of these authors: www.computer.org/computer-multimedia.

Once you have read these thought-provoking articles, you can make a decision to be part of bringing about change by talking with your daughters, nieces, neighbors, and their school counselors about the wonders of computing and how the next generations of computing professionals will have an even more exciting opportunity to change the world. You also can share this copy of *Computer* with others—please pass it along.

We face a great challenge, but it is one that can be conquered if we all work together. We need to recognize that to be successful, we must have a diverse workforce, and we all need to help build it.

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