

Minority-Minority and Minority-Majority Technology Transfer

Finding technology solutions to help those in need can often lead to welcomed answers for all if we look at the big picture.

I'm writing this piece while flying home from a workshop on broadening the participation of underrepresented groups in computing. As one of the few majority men at this gathering, I'll share a few observations here as I likely had a different perspective.¹

An unexpected outcome of the workshop was that the underrepresented groups had more in common than many believe, in that a program could be developed that would help efforts across many communities rather than requiring a separate, special program for each community. For example, groups were initially formed by community, but reports from breakout sessions could largely be used by any community. Common issues among them were mentoring, motivating the young people of their community to learn computing, and compensating for weaknesses in the education pipeline. Sharing may increase participation even more quickly since we could reuse courses, training, leaders, and so on. Let's call this "Minority-Minority Technology Transfer."

I was even more surprised to see that almost all solutions proposed to help the underrepresented groups would, in my view, also help majority groups.²

For example, a representative of indigenous groups said it was difficult to find qualified computer science teachers. She was interested in learning

if distance education could help teach programming to her students. Ironically, I had the same conversation with a relative who is in charge of IT education at a school district near Berkeley. Given the pay scales of high schools, as soon as teachers in his district have enough skills to teach programming, they leave for much higher paying jobs. He tried to hire people with programming skills during the dot-com bust, but high school principals nixed the deal since they were skeptical that programmers would stay once the job market improved.³

Hence, a distance education program developed to help indigenous students in South Dakota might be just what we need for students of all backgrounds near Berkeley, or even Bangalore, or Brasilia. In general, I bet successes in one locale may well transfer to other ACM members around the world.

As I think about it now, we had a concrete example of such "Minority-Majority Technology Transfer" when I chaired the Computing Research Association. A successful workshop from the CRA's Committee on the Status of Women in Computing Research (CRA-W) offering advice to new female faculty was later replicated to offer advice to men and women. We absolutely leveraged all the material, lessons learned, and people from the CRA-W workshop. CRA still offers both types of workshops,⁴ and both are highly valued by new faculty.

¹The Web site for this CRA-organized workshop is www.cra.org/Activities/workshops/broadening.participation/.

²I'm not the first to make this observation. Richard Tapia of Rice University made this point in his famous 1992 speeches: "Houston is 1/3 Black, 1/3 Brown, 1/3 White."

³If you're interested in the role of computer science in K-12 education, please participate in ACM's new Computer Science Teachers Association; csta.acm.org. It's just getting off the ground, and we would love to have your help.

⁴To learn more, see www.cra.org/highlights/faculty.html.

President's Letter

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Following this line of reasoning, a different perspective on programs for underrepresented groups is that they are really just beta tests. We pick these communities because it is easier to find the resources and the volunteers. When beta tests are successful, the programs can then be replicated for everyone. Note that this perspective implies careful evaluation is a critical part of such programs.

A second issue concerned changing the way computer science and engineering is defined and perceived in order to be more inclusive. A specific example is changing textbooks. When I reported that my friend John Hennessy and I have actually tried to do this, they recommended I share what we did.

Our view is that although many computer science and engineering students enjoy IT for technology's sake, some have more altruistic interests. This latter group tends to have more women and underrepresented minorities. We believe IT is more valuable for humanity than most other topics you could study: whether it is preserving our art heritage, helping Third World countries, saving our environment, or even changing political systems.

Consequently, we added a new element in the third edition of our undergraduate book [1]. We call the two-page layout at the end of each chapter "Computers in the Real World." Here are our eight examples of nontraditional applications:

- Information Technology for the 4 Billion without IT
- Helping Save Our Environment with Data
- Reconstructing the Ancient World
- Moving People Faster and More Safely
- Empowering the Disabled
- Mass Communication without Gatekeepers
- Saving the World's Art Treasures
- Saving Lives through Better Diagnosis

We think readers of these segments will have a greater appreciation of the computing culture beyond the inherently interesting technology.

Such material may help broaden the participation of the underrepresented as well as fire the imaginations of all students by giving them new, exciting challenges. We hope other books in computing will also demonstrate the value of computing in nontraditional areas. (Authors should appreciate that 16 pages doesn't really increase the cost of a 650-page book, and these segments were fun to write. In addition, we tried several new ideas in this edition, yet "Computers in the Real World" was the most popular with reviewers.)

I believe that authors of undergraduate computing textbooks should do more to help broaden participation than just being careful about the gender of pronouns.

Perhaps all of us can find our own way to help broaden our field. Minority-Minority and Minority-Majority Technology Transfer suggests that if you succeed at helping some of us, then you will likely help us all.⁵ **C**

REFERENCE

1. Patterson, D.A. and Hennessy, J.L. *Computer Organization and Design: The Hardware/Software Interface*, Third Edition. Morgan Kaufmann, San Francisco, CA, 2005.

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⁵If you'd like to participate, one way is to join ACM committees, among them ACM's Committee on Women in Computing, women.acm.org; and ACM's SIG on Accessibility and Computing, www.acm.org/sigaccess; and the ACM, CRA and IEEE-CS jointly sponsor Coalition to Diversify Computing (CDC), www.nca.uiuc.edu/Outreach/CDC/.