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Subject: Women in Computing
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To: Charles Severance <csev@umich.edu>

Hi Chuck,

Great talking with you this morning. Below is that answer to the Anita Borg Scholarship that I was mentioned to you. Hope it helps!

All the best,
Nikki

Anita Borg proposed the "50/50 by 2020" initiative, so that women earning computing degrees would be 50% of the graduates by year 2020. However, the percentage of computer science degrees earned by women is still far from 50% throughout the world. What might you propose that could be implemented by a school, the government, an organization, or a private company to reverse the trend? Short of getting to 50/50 by 2020, how would you measure the success of your program? Suggested count for each question is 400-600 words.

This may sound slightly obvious, but we need more female programmer role models if we want to increase the number of women who complete computer science degrees. We need role models not just in the form of more images of women programmers in popular media (a la Angelina Jolie as Kate Libby in "Hackers"), but even in more modest forms like computer science teachers. I sincerely doubt anyone intentionally created an "old-boys' club" in computer science (at least I hope not); however, the pattern is self-perpetuating, as male students gravitate towards male mentors creating subtle yet noticeable social barriers for women to enter the field. Similarly male mentors frequently choose mentees who remind them of themselves both in skill and in gender. In many ways it is a catch 22; few female role models limit the number of women going into the field thus decreasing the number of female role models. So the challenge really becomes how can technical fields like computer science create space for female role models when they have been traditionally dominated by men?

Maybe the answer is to start sooner than at the university level: by teaching grammar school children that these skills are acceptable for both men and women, maybe we can instill greater camaraderie among all computer scientists and weaken the tendency for gender-based self-selection. Girls and boys should be shown at a much earlier age that computer science is not only for boys. They should grow up knowing that programming can be fun for everyone. I'm envisioning a sort of Code Academy, the online tutorial to learn JavaScript interactively, for girls in elementary school. Or perhaps a targeted program could build off of Lego Mindstorms and arduino hacking to make the experience of programming, literally, more tangible. The point is, I believe more girls would be interested in computer science if they were being given the cultural cues by their families, teachers, and society in general that this is a field that is welcoming of everyone.

Impact measurement is something that I'm very interested in, so I'm curious about the decision to measure the initiative by the number of women earning computing degrees by 2020. I agree that that number will be very difficult to achieve by 2020. However, if we were to expand the definition somewhat to include women who learn computer science skills on the job, I wonder how far from 50/50 we actually are? I believe that increasingly women have had to learn programming as a function of the growth of the service industry of our economy. While they might not have gotten degrees in computer science and they might not even think of themselves as computer scientists, I would argue that a growing number of service sector jobs in America require some basic principles of computer programming. I started doing Masters'-level course-work in computer science while I was working at the New York Federal Reserve Bank because I needed to learn more about the programming I was already doing on a day-to-day basis for my job. A degree is important, but there are also many professionals who are teaching themselves with books, online tutorials, or just by googling terms. Who is to say that a UX designer who taught herself HTML, PHP, and JavaScript isn't a computer scientist? Or how about an administrative assistant who runs MySQL queries on an office database to get a list of customers fitting some criteria for a mailing list?

I don't know how we could improve the ratio of females earning computer science degrees so drastically in six years time. If however, the ratio of women who are in programming related jobs (not just those graduating with computer science degrees) is approaching 50%, then I would say that the timing was ripe for an educational program targeted at elementary school students. Yes, a program targeted at young girls should start as soon as possible; but going back to the lack of female role models, until little girls can come home and talk to their moms, aunts, grandmas, and cousins about their assignments and get positive, encouraging feedback (and possibly even some help) girls will struggle to see the field of computer science as a space that welcomes them.