
To fix the tech gender gap, fix computer science education

by Elsie Eigerman | December 18, 2018 05:11 PM

Debate is raging over the statistic that even though roughly [74 percent](#) of female elementary school students express an interest in STEM, less than 1 percent eventually choose computer science as a college major. Microsoft put out an ad where they guilt-tripped young girls to "[Stay in STEM](#)" and the Spectator recently published an [article](#) that argues the lack of female computer science majors is simply the result of a lack of interest on the part of women. These concerns ultimately miss the point.

This dearth of women in tech isn't because women hate computer science or simply due to the [widespread harassment](#) that many women experience in the industry. The real reason men dominate the computer science industry is because computer science education is only accessible for a small percentage of students who are disproportionately male.

To understand this imbalance, one must first understand the academic environment. To start, there's a [serious shortage](#) of professors in computer science. A combination of the high demand for computer science classes and this shortage of professors makes it incredibly difficult for colleges to offer well-taught and accessible courses. The problem is not that computer science in and of itself is hard, but instead that it is barely taught.

The problem begins in high school. Many students encounter computer science for the first time in college, this is essentially like walking into your second-grade classroom to find that your teacher has been replaced with a mathematics professor. He may be brilliant and a major thinker in his field, but for him, doing times tables is like breathing — so he may not be the best person to explain the concept to complete beginners.

Worse yet, textbooks and other learning materials are often written by professors who struggle to introduce concepts one-by-one and, as such, are difficult to follow. Computer science has a variety of introductory concepts that, while not difficult, can be very confusing

if not explained properly. What inevitably ends up happening in many introductory computer science classrooms is that either the student comes in already knowing the information, figures out how to teach themselves, or drops the class and gives up on computer science.

As a result, the current computer science curriculum ends up favoring the type of person who has previous technical knowledge and who, when faced with a poorly-taught class, will blame the professor and keep going with the subject. In short, they have to already know how to code — and be arrogant.

This archetype is disproportionately likely to be male. Men are more likely to have been previously [exposed to technical subjects](#), five times more likely to have been programmers on [high school FRC robotics teams](#), and four times more likely to have taken [advanced placement computer science classes](#).

Women also [internalize feedback differently](#). Take for example, the case of Anson Dorrance, the coach of University of North Carolina women's soccer team who in his 38-year tenure won [800 of the 900 games](#) they played. He found that basic coaching techniques for men, like showing video of failed plays, simply don't work for women. To [quote](#) Dorrance, "I've never met a male athlete who's felt he's made a mistake in an athletic competition in his life. Video tape is proof." But for female athletes, "video tape is redundant." Women take criticism more personally than men and are more likely to see themselves as at fault.

This is not to say that women need to be handled with kid gloves; intense self-criticism is likely the reason they [outperform male classmates](#) in most other circumstances. With computer science, however, failing repeatedly is core to finding and solving problems in the code. If that is paired with unclear instruction and learning materials, female students are more likely to start believing that they are bad at computer science, when really their environment is the problem.

This type of narrow selection would be fine, albeit not ideal, if we lived in the world of the 1970s when computer code was the purview of hobbyists, academics, and the military — but that simply is not the world we live in. There are nearly [10 times](#) as many software jobs as there are computer science majors, and jobs that previously had little to do with computer science, like economics and advertising, have grown reliant on computer science.

Even if you think it's not a big deal that just 18 percent of computer science majors are women, it is still a symptom of a much larger problem. As a society, we need millions more people to major in computer science. This means bringing more women into the fold and, to start fixing how computer science is taught.

Our failure to teach computer science properly is a far-reaching problem with disastrous consequences — both for women and the workplace.

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