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Viewpoint
By Vivek Wadhwa

Fixing Engineering's Gender Gap
Women should be mentored not only to be engineers, but to become entrepreneurs in the field. And such encouragement has to start early

President Bush recently announced a $136 billion program to encourage innovation and strengthen the ability of the U.S. to compete in the global economy. The conventional wisdom is that the nation needs to graduate more engineers or India and China will eat our lunch.

We can debate whether an engineering gap between the U.S. and India and China exists, but among U.S. engineers there is an indisputable gender gap -- fewer than 20% of engineering graduates are women, according to the National Science Foundation. Perhaps a simple solution to maintaining American competitiveness is to encourage more women to enter engineering.

Women have succeeded in larger numbers in fields such as physiology, biology, and social sciences, and they are having increasing success in starting small businesses. Increasingly, engineers and technologists have an advantage in reaching the top, yet in these fields women constitute the smallest minority.

THE NEXT APPLE? Duke University board member Kimberly Jenkins says she often felt lonely and isolated as she rose through the ranks of Microsoft (MSFT) in the 1980s to become president of the company's education division. It wasn't that Bill Gates and Steve Ballmer weren't supportive, but it was a constant struggle to fit in and adapt to the dominant male culture. She found equal challenges at NeXT, a software company run by Apple (AAPL) founder Steve Jobs. As a woman, she was always treated differently and had to work harder to prove herself.

Jenkins recently joined Duke's Pratt School of Engineering as an entrepreneur in residence. She had a clear objective -- to provide mentorship to others who would likely face the hurdles she did.

She had always been concerned about the low engineering enrollment rates for women. But she was surprised by how few female students would attend school events centered on entrepreneurship. Americans generally see entrepreneurship as a path to both financial well-being and independence. And statistics show that business ownership among women is growing at nearly twice the rate as all businesses (see BW Online, 3/8/06, "Women Leading the Way in Startups"). So why weren't these women trying to learn how to create the next Microsoft or Apple?

Jenkins conducted a series of focus groups with 50 undergraduate women from all fields of study to understand their issues. She found the following to be the top issues:

Lack of role models. Students felt that in classes that covered leaders like Gates and Jobs, all of the examples were male -- and a woman who leads was seen as deviant. This led to the feeling that maybe "a woman can't make it."

Lack of female mentors. According to the National Science Foundation, women make up only 5.2% of tenured engineering faculty. Students felt that they had no one to turn to for help and guidance. One student said she felt disadvantaged "when it comes to being an engineer without being like a man." Another commented, "Engineering professors make terrible mentors; they can't mentor unless it's about discussing an equation."

Discrimination. Students felt frustrated and angry that women were treated as inferiors in business and academia. Comments included, "Women get asked to be the secretary even though they aren't any good at taking notes," and "I'm taken less seriously than the guys in my group. Members of the group assume I'll be more emotional and my co-leader will be more credible."

Balancing work and family. Many young women were clear about wanting a family as well as a career. But they expressed resentment that men had a sense of entitlement and didn't have to think about how they might need to balance the responsibilities of child rearing with their careers. They felt at a disadvantage with employers who assumed women would take considerable time off from work to raise children. Thus, fewer women were likely to be hired or given key responsibilities.

Perception and self-promotion. Students also believed that women were at a disadvantage when highlighting their accomplishments. In the students' view, "Men are taught to be self-promoting, but if a woman self-promotes she runs the risk of being heavily criticized and called a you-know-what."

IMBUING CONFIDENCE. Duke University Dean of Engineering Kristina Johnson is one of the increasing number of women who have succeeded in spite of the obstacles. She credits this to her upbringing. Her father and grandfather were engineers and acted as role models and mentors. She says that she was never told she couldn't be a scientist or engineer; to the contrary, she was led to believe she could be one.

Both Johnson and Jenkins believe that fixing this problem will require a concerted effort from parents, schools, government, and business. Here are some of their recommendations:

Parents should encourage their daughters, not just their sons, to fix a broken appliance or learn about technology. They should help girls make the connection between working on a project and making a difference (as opposed to just getting turned on by bits and bytes), and encourage them to study math and science. Younger girls start with a strong sense of confidence in these areas that fades as they succumb to cultural pressures.

NATIONAL PRIORITY. Universities must hire more women and set proactive targets. They should invest not only in the infrastructure for supporting science and engineering, but also in

hands-on learning opportunities outside of the classroom. They should actively promote programs that align engineering with solving humanitarian issues.

Government must make math, science, and engineering education a national priority, and create programs for children that provide hands-on experience with science and math concepts and help them understand the alignment of engineering careers with social issues. We need programs that parallel the Title IX legislation, which led to a tenfold increase in participation of girls in sports. We should increase research spending.

Corporations must realize that it's not just about child care, flex schedules, and maternity and paternity leave. Business leaders should be aware of the sense of isolation that some women feel in heavily male-dominated fields. They should build a critical mass of women, encourage women to have a voice, and eliminate all forms of discrimination.

These solutions aren't easy, but they're not expensive either. We don't have to spend tens of billions of dollars to stay ahead. America can maintain its competitive edge by better utilizing its most valuable resource -- its people.

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