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Women and science: the real issue

By John Hennessey, Susan Hockfield and Shirley Tilghman | February 12, 2005

HARVARD PRESIDENT Lawrence Summers's recent comments about possible causes of the under-representation of women in science and engineering have generated extensive debate and discussion -- much of which has had the untoward effect of shifting the focus of the debate to history rather than to the future

The question we must ask as a society is not "can women excel in math, science, and engineering?" -- Marie Curie exploded that myth a century ago -- but "how can we encourage more women with exceptional abilities to pursue careers in these fields?" Extensive research on the abilities and representation of males and females in science and mathematics has identified the need to address important cultural and societal factors. Speculation that "innate differences" may be a significant cause for the under-representation of women in science and engineering may rejuvenate old myths and reinforce negative stereotypes and biases.

Why is this so important? Our nation faces increasing competition from abroad in technological innovation, the most powerful driver of our economy, while the academic performance of our school-age students in math and science lags behind many countries. Against this backdrop, it is imperative that we tap the talent and perspectives of both males and females. Until women can feel as much at home in math, science, and engineering as men, our nation will be considerably less than the sum of its parts. If we do not draw on the entire talent pool that is capable of making a contribution to science, the enterprise will inevitably be underperforming its potential.

As the representation of women increases in every other profession in this country, if their representation in science and engineering does not change, these fields will look increasingly anachronistic, less attractive, and will be less strong. The nation cannot afford to lose ground in these areas, which not only fuel the economy, but also play a key role in solving critical societal problems in human health and the environment.

Much has already been learned from research in the classroom and from recent experience on our campuses about how we can encourage top performance from our students. For example, recent research shows that different teaching methods can lead to comparable performance for males and females in high school mathematics. One of the most important and effective actions we can take is to ensure that women have teachers who believe in them and strong, positive mentors, male and female, at every stage of their educational journey -- both to affirm and to develop their talents. Low expectations of women can be as destructive as overt discrimination and may help to explain the disproportionate rate of attrition that occurs among females as they proceed through the academic pipeline.

Colleges and universities must develop a culture, as well as specific policies, that enables women with children to strike a sustainable balance between workplace and home. Of course, achieving such a balance is a challenge in many highly demanding careers. As a society we must develop methods for assessing present and future productivity that take into account the long-term potential of an individual and encourage greater harmony between the cycles of work and life -- so that both women and men may better excel in the careers of their choice.

Although we have a long way to travel in terms of recruiting, retaining, and promoting women faculty in scientific and engineering fields, we can also point to significant progress. According to the National Science Foundation, almost no doctoral degrees in engineering were awarded to women in 1966 (0.3 percent), in contrast to 16.9 percent in 2001. And in the biological and agricultural sciences, the number of doctorates earned by women rose from 12 percent to 43.5 percent between 1966 and 2001.

Our three campuses, and many others, are home to growing numbers of women who have demonstrated not only extraordinary innate ability, but the kinds of creativity, determination, perceptiveness, and hard work that are prerequisites for success in science and engineering.

These figures demonstrate the expanding presence of women in disciplines that have not, historically, been friendly to them. It is a matter of vital concern that the future holds even greater opportunities.

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