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America Desperately Needs More STEM Students. Here's How to Get Them

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There is no doubt that to advance our economy and our society we need to create the next great technology innovations, not just consume them. That's why there is such urgency for the U.S. to develop a stronger workforce of experts in science, technology, engineering, and math (STEM). After all, according to the U.S. Department of Labor, only 5% of U.S. workers are employed in fields related to science and engineering, yet they are responsible for more than 50% of our sustained economic expansion.

STEM-related disciplines are responsible for many of the societal innovations that make our world better. Last week, for example, IBM's Sequoia supercomputer at the Lawrence Livermore National Laboratory set a world record in computing speed by breaking the 16 petaflop barrier. That represents an astounding 16,000 trillion calculations per second. What could be done with that kind of computing power? Sequoia could run a simulation of how the human heart reacts to new medicine in two days instead of two years. It could provide a 40-fold improvement in the prediction of earthquakes to help provide safer evacuation routes. Sequoia is a powerful example of what American ingenuity in STEM-related disciplines can mean for the betterment of society.

So it is clear that to benefit our economy and society, our national priority should be on encouraging more students to study STEM. Unfortunately, the U.S. is trending in the opposite direction. When I graduated from college, about 40% of the world's scientists and engineers resided in the U.S. Today that number has shrunk to about 15%.

To turn this trend around, we need to improve both the size and composition of the pipeline of U.S. STEM students. Here's how.

First, we need to increase the size of the STEM education pipeline by maintaining an enthusiasm for science, technology, engineering and math throughout high school and college. Our youngest students show an interest in STEM subjects, but the President's Council of Advisors on Science and Technology has concluded that roughly 40% of college students planning to major in engineering and science end up switching to other subjects. How important is it to increase the retention rate of STEM majors in U.S. colleges? STEM-related degrees represent only about a third of all the bachelor's degrees awarded in the U.S. In Japan, China and Singapore, that ratio is more than one in two.

Public-private partnerships can help improve this ratio. For example, IBM is a partner in new schools in New York and Chicago that focus on STEM education. Students at these innovative grade-9-to-14 schools will graduate with an associate's degree, along with the skills and knowledge they need to continue their studies or transition directly into jobs in the information technology industry. The schools also pair students with corporate mentors, who help guide curricula and provide real-world insight into industry trends. Public-private partnerships like this can help invigorate and maintain students' interest in STEM.

Second, we need to improve the composition of the STEM education pipeline to include more women and underrepresented minorities. Although women fill close to half of all jobs in the U.S., they hold less than 25% of STEM-related jobs. At the same time, 43% of school-age children today are of African American, Latino, or Native American descent. Yet of all the engineering bachelor's degrees in the U.S., less than 15% are awarded to underrepresented minorities. We need to reconcile these opposing trends so that the composition of our STEM education pipeline reflects America's shifting demographics.

On the national level, Congress and the administration have shown an interest in the issue, pursing legislation and enacting programs to help expand the number of underrepresented minority students studying STEM in college. National nonprofit organizations, like the National Action Council for Minorities in Engineering, also play an important role, by supplying Congress with research and policy analysis, in addition to providing scholarships directly to students.

Finally, let's not overlook contributions from local, personal efforts. Sometimes students just need role models who inspire them to pursue STEM-related careers. For me, that person was my father, who encouraged me to deconstruct, analyze, and experiment with our home appliances. The insight I gained into how things work together opened my eyes to new possibilities and instilled in me a desire to create new technologies.

As we look to the future, improving the size and the composition of the STEM education pipeline will strengthen our country's global competitiveness and unleash new innovations that will propel society forward. Yes, STEM-related education can be challenging at times, but it can also be inspiring. Let's encourage the next generation to study STEM by teaching them that the technology that surrounds their daily lives is not just for their consumption, it is for them to create and build upon. It will be their innovations that eradicate disease, improve the environment, and power a brighter future.
