

# STEM Re-evaluated

According to the Government Accountability Office, the proportion of students obtaining degrees in science, technology, engineering, and math (STEM) from American universities has dropped from 32 percent to 27 percent during the past decade. At the same time, the percentage of non-American students earning these degrees from American universities has increased dramatically. These facts can be partly attributed to a trickle-down effect that began in U.S. elementary schools.

The National Science Foundation reports that non-Americans graduating from American universities accounted for more than half of the doctorate recipients in physics (58 percent), computer sciences (65 percent), engineering (68 percent), and mathematics (57 percent). The highest numbers of these non-American graduates were from China, India, and Korea, respectively. In addition, the Organisation for Economic Co-operation and Development found that more than 40 percent

of non-American doctoral degree recipients intended to leave America.

Not only are we losing ground to non-Americans at our own universities, but we are also falling behind other nations. America is no longer the leader in STEM education. In absolute numbers, Japan and China are producing more graduates. America's rate of STEM to non-STEM graduates is roughly 17 percent, while the international average is nearly 26 percent. We're not even keeping pace with some developing countries.

This trend threatens our economic prosperity and national security. If it continues unabated, America stands to lose its position as the world leader in scientific and technological innovation. Our global competitive advantage will shift to other nations.

Why is there a significant decline in the percentage of Americans earning STEM degrees? Because there is also a significant decline in the percentage of American men graduating in these fields. Even absolute numbers are dropping. For example, there were 11,683 doctoral degrees in science and engineering awarded to American men in 1996 and only 8,884 awarded in 2005, according to the National Science Foundation. This would not represent a problem if the increase in the percentage and absolute numbers of American women earning STEM degrees filled the void, but that is not happening.

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### The Root of the Problem

Why are American men losing interest in science, technology, engineering, and math? It is, in part, because of the way those subjects are now being taught in primary and secondary schools.

Take math, for example. Boys outscored girls in math for decades. In order to close this gender gap in education for girls, the American Association of University Women and other researchers influenced educators to change the way they teach the subject from a numbers-based approach—which favors boys—to a language-based approach—which favors girls.

Now, two decades later, math is still being taught in the way that favors girls. Girls are, on average, more skilled than boys in language. Math has become less about numbers and more about language. Over the years, math tests have increasingly included more story problems and essays. Getting the correct answer has become less important than describing the approach taken.

Number crunching is out; definitions and terminology are in. For boys, math has become a four-letter word.

Albert Einstein once said: "These thoughts did not come in any verbal formulation. I rarely think in words at all. A thought comes, and I may try to express it in words afterward." Einstein would have a difficult time in today's math classroom.

According to the U.S. Department of Education, girls have nearly caught up to boys in math and now constitute the majority of students in math classes. The changes made to help girls improve in math are inspiring.

One of the consequences of these changes, however, is that boys have become less interested in math. They've also become less interested in science, technology, and engineering.

There must be a way to meet in the middle. How can we advantage girls in STEM classes without disadvantaging boys, and vice versa? Perhaps we should separate the sexes so we can accommodate the learning differences between boys and girls. Or perhaps we can create new ways to teach these subjects that favor neither sex. The answer to this question holds implications for America's economic growth and national security. ■

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### HERE'S YOUR CHANCE TO SPEAK OUT

The author believes that American students are losing ground to non-Americans when it comes to obtaining degrees in science, technology, engineering, and math (STEM)—and that elementary schools are partly responsible for this trend. What are your teachers doing to pique students' interests in STEM classes? Do you see a difference in your school between boys and girls regarding their interest in these subjects?

Submit your thoughts at [www.naesp.typepad.com](http://www.naesp.typepad.com) and click on "Speaking Out."