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A SILVER LINING TO OUR SCIENCE STRUGGLES

America is worried that its global scientific advantage is in jeopardy, but is the picture really all that bleak?

by [DAVID EPSTEIN](#) • Posted June 29, 2006 12:48 AM

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The numbers are frightening. They indicate that the flow of scientists and engineers graduating from American universities is slowing to a trickle. At the same time, schools in China and India have opened the proverbial floodgates.



Credit: Slawomir Jastrzebski

The National Academies [shined a spotlight on the figures](#) in its influential ["Rising Above the Gathering Storm" report](#). According to senior government officials, this report [spurred President Bush](#) to announce the American Competitiveness Initiative during his 2006 State of the Union address.

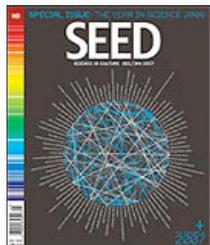
Secretary of Education Margaret Spellings dropped figures from the NAS report in a [Newsweek op-ed](#): "Last year," she wrote, "China's schools graduated more than 600,000 engineers and India's schools produced 350,000, compared with 70,000 in America."

Partisans on either end of the political spectrum seem equally eager to trumpet the data—both [Edward Kennedy](#) and [Newt Gingrich](#), for example, cited them when warning about America's ever-more-precarious economic advantage over upstart developing nations.

What worries all these

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science alarmists is not that China and India will emerge as major players in the global science market—that's a given—but that those nations will become America's superiors, rather than its peers.

Citing everything from "nerd" stigma to insufficient pay, representatives have taken the floor at multiple Congressional hearings to bemoan what they say is a recent downward trend in the number science PhDs awarded in the US. Adding to the alarm is the fact that more foreign students are staying home, either by choice or because of [difficulty obtaining a visa in post-9/11 America](#).

Despite this apprehension, some observers have concluded that the situation may not be as dire as politicians have suggested. In fact, some researchers closely studying the American science pipeline actually see much to be confident about.

The members of the National Academies disavowed their original numbers in February, adopting [less foreboding data](#) that provides new figures for Chinese or American engineers. The army of 600,000 Chinese was replaced with "about 350,000 engineers, computer scientists and information technologists with four-year degrees," while the reported number of American engineers doubled to 140,000.

The new numbers come from a [December 2005 report](#) out of Duke University, compiled by Vivek Wadhwa and Gary Gereffi. Wadhwa is a lifelong tech entrepreneur who has been outsourcing projects to the developing world since the early 1990s, and is now an "executive-in-residence" at Duke's engineering school. Gereffi is director of Duke's Center on Globalization, Governance and Competitiveness.

Wadhwa and Gereffi found that the oft-quoted numbers didn't filter for expertise. Using data from the National Center for Education Statistics, the National Association of Software and Service Companies and the Chinese Ministry of Education, they determined that many of the Chinese and Indian degrees are "sub-baccalaureate," awarded to the "equivalent of motor mechanics and industrial technicians." They also found that in 2004, the United States actually awarded 137,437 engineering, computer science and IT bachelor's degrees, versus China's 351,537, and India's 112,000. Per capita, the report adds, that's 468 per million citizens in the US, versus 271 and 104 per million in China and India, respectively.

A 2005 McKinsey and Company Global Institute [labor study](#) found that a higher percentage of engineers in lower profile nations like Poland, Hungary and Malaysia are competitive in the global job market compared to Chinese and Indian engineers. Only about 10 percent of China's engineers and 25 percent of India's are qualified worldwide.

Still, as China and India continue to develop their universities at breakneck speed, "it's inevitable," Wadhwa said, that they will eventually produce many more qualified scientists and engineers than the US.

But, Wadhwa points out, China has more dentists too.

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