

March 16, 2007, 10:35 am

## Counting Engineers

How many engineers do China and India have compared with the U.S.? It depends on how you define “engineer.”

Motor mechanics and shipbuilders are counted in China’s official statistics, as are recipients of two- or three-year degrees, according to [an article](#) in the new issue of *Issues in Science and Technology*, the magazine of the National Academy of Sciences. By this definition, Chinese universities may have awarded more than 517,000 degrees in engineering, computer science and information technology in 2004-2005, nearly four times the U.S. total, but the article questions the quality of those degrees. “Graduation rate increases have been achieved by dramatically increasing class sizes,” according to the article, and only graduates of the top-tier universities have much credibility in the job market.

That stands in contrast to a perception that China’s number of engineers is surging ahead of that of the U.S., which — the perception goes — must invest heavily in expanding undergraduate engineering programs. This perception has been summarized by a misleading, apples-to-oranges formulation that the U.S. graduates roughly 70,000 undergraduate engineers annually, whereas China graduates 600,000 and India 350,000 — a mantra repeated in news articles and by politicians and government agencies.

I wrote about these numbers twice in 2005. The debate over the numbers prompted research by Vivek Wadhwa, the lead author of the *Issues in Science and Technology* article and an executive in residence at Duke’s Pratt School of Engineering. In a [2005 paper](#) and the new article, he argues the U.S. is “way ahead on a per capita and quality basis,” at least when it comes to bachelor’s degrees.

Yet there are signs the U.S. does face a real problem with advanced degrees. “China is racing ahead of the United States and India in its production of engineering and technology PhDs and in its ability to perform basic research,” Mr. Wadhwa and colleagues wrote. India’s shortage may be the most severe: There aren’t enough PhDs to staff some universities. One proposed fix: “Make it easier for foreign students to stay after they graduate.”

Certainly, faulty numbers don’t help move the policy debate forward.