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Where are all the Ph.D's gone?

In a sterling teaching career spanning four decades at Stanford, Thomas Kailath, Hitachi America Professor Emeritus of Engineering, has graduated a record 74 doctoral candidates. The Pune-born hi-tech guru's first Ph.D student in 1965 was a Dutchman, followed by a host of Caucasian Americans with names such as Kramer, Duncan, Frost, Daly and Hall. The late 1970s and 1980s saw students with names like Sidhu, Kung, Hadidi, Lee, Rao, Lev-Ari, and Chun graduate under Kailath, as fewer Americans took up the challenge of Ph.D.

By the time the celebrated professor began winding down his academic commitments in 2002, Americans had completely fallen off the chart. The list of his last ten Ph.D students reads: Aghajan, Park, Khalaj, Wang, Boros, Hassibi, Halder, Erdogan, El-Awady and Vikalo. They are Korean, Chinese, Indian and Iranian and Turks in the lot, but not one American-born scholar.

It is a familiar story across America's elite institutions such as MIT, Harvard, UCLA etc. The gradual decline of Americans going in for Ph.D in science, engineering and math is at the heart of the current crisis of jobs and employment in the U.S hi-tech sector. For all the fulminating about foreign-born scientists and engineers and flight of top level jobs, the fact is the U.S is just not producing enough science and engineering minds. If anything, say some researchers, Americans are running away from the challenge of science and math. The crisis begins in high-school and extends all the way to the top.

According to a recent National Science Foundation Study there has been a five per cent decline in overall doctoral candidates in the U.S over the last five years, going down from a peak of 42,652 in 1998 to 39,955 last year. While U.S citizens continue to dominate in humanities and social sciences, there is a steady decline in Americans getting Ph.Ds in physical sciences (down from 6679 to 5715). They are also ditching mathematics (1123 to 917) and computer sciences (909 to 811).

The study points to more and more foreign-born students, particularly Asians, getting doctorates, evidently, at the expense of Americans. In engineering, for instance, the number of US-born doctorates went down from 2739 in 1997 to 1890 in 2002. The corresponding rise for foreigner-born doctorates was 2555 to 2645.

As a result, the share of foreign-born scientists and engineers in U.S S&E occupations stands at 29 per cent at the Master's level and 38 per cent at the doctoral level. At a meeting of graduate school deans held in Washington recently, the sci-tech studies crisis topped the agenda. For the first time, US educationists discussed the prospect of brain drain from America.

Typically, the top three countries of origin of non U.S citizens earning doctorates are China, India and Korea. The University of Illinois in Urbana-Champaign (UIUC), whose acronym is sometimes jokingly referred to as the University of Indians and University of Chinese, topped the list of institutions which had the largest number of non U.S citizen doctorate recipients, followed by UC Berkeley.

But foreign grads are now conquering even smaller campuses. Last month, Rapid City in sleepy South Dakota celebrated its youngest and fastest Ph.D to graduate from its School of Mines and Technology. Sreedevi Dawadi, an undergrad from Hyderabad's Deccan College of Engineering, came here in August 1999, finished her master's work in six months, took a three-month break, and wrapped up her Ph.D in just over two years. While Sreedevi will doubtless go on to be a star in the American scientific firmament, the U.S needs to think hard about its own sons and daughters deserting science and math.
