

Financial Times

May 14 2006

Asian giants and the brains bazaar

By Michael Schrage

When two Asian countries consistently graduate the world's greatest numbers of science and engineering PhDs, forgive the nervous twitching among wealthy western economies. After all, high technology and higher education are supposed to be the west's magic elixir for perpetual growth. Well, maybe not.

“The new competitors, China and India, are unlike any competitors we have seen in our lifetime, because they can bring limitless demographics and a strong technical underpinning,” Jeffrey Immelt, the chief executive of General Electric, observed earlier this year. “These are people who like being engineers. So it's a different competitor today... and that's made people afraid every place in the world.”

That fear is not irrational. Global technology leaders such as GE, SAP and Google have launched Chinese and Indian research centres not merely to ease market access but because that is where they are finding the best bargains for the best brains. To the queasy surprise of US and European universities, these two nations are nascent “technical education superpowers” whose high-volume “output” increasingly competes with the best of the west's. America's National Academies recently estimated that the cost of employing one chemist or engineer in the US equalled that of roughly five chemists in China and 11 engineers in India. But is their educational quality truly comparable? The smart money answer is: they are becoming comparable far faster than anyone predicted. Higher education is becoming as much a high-tech commodity as circuit boards and mobile phones.

India and China already produce nearly 1m engineering graduates a year compared with roughly 170,000 such graduates from the US and Europe. Even if one (arrogantly) presumes that only the top 10 per cent of Indian and Chinese students are as talented as the top half of Americans and Europeans, the two Asian giants now graduate more quality engineers than the west. In the face of this demographic deluge of human capital investment, the scientific, engineering and policymaking establishments of Europe and America propose sharply to increase the number of science and engineering graduates. Eurocrats in Brussels are pushing for a new “European Institute of Technology”; America's National Academies are calling for greater investment in science and technology education. “More” and “better” homegrown students are deemed essential to global high-tech success.

What nonsense. What aspect of “supply and demand” do these elites refuse to understand? Western students clever enough to succeed in science or engineering are clever enough to know they will compete against growing global armies of educated

rivals trained to work hard for less. Alarmists might decry this competition as “cognitive sweatshops”. Pragmatists see the contest as a buyer’s market in brains.

High-bandwidth networks further amplify corporate capacity more easily to outsource their science and engineering processes. Innovative companies will chase “cheap smarts” as relentlessly as today’s cost-conscious multinationals pursue cheaper manufacturing and call-centre capacity. Try commanding a premium wage as a post-doctorate in that marketplace. **Knowledge is not power; it is on sale.**

In this scenario, there is no global shortage of scientists and engineers. On the contrary, there is more likely a glut of technically sophisticated human capital. For the US and Europe, increasing the numbers of science and engineering graduates seems a policy prescription for economic despair. **Creative differentiation – not competitive confrontation – is the real human capital challenge.**

That will prove more difficult for Europe than America. The European Union’s 1999 Bologna Declaration effectively commits EU universities to standardisation policies that many university leaders believe discourage flexibility. **Employment rules that make hiring first-rate Chinese electrical engineers abroad easier than firing second-tier French Polytechnique graduates at home likewise constrict innovation.**

Of course, a wealth of scientists and engineers is not the wealth of nations. University dropouts such as Microsoft’s Bill Gates and Apple’s Steve Jobs persuasively demonstrate that global technology leadership does not require top degrees. Those high-tech billionaires employ a phalanx of PhDs. Technical education is a necessary – but insufficient – condition for continuing growth. While rising tides of cheaper technical talent create greater innovation opportunities, transforming educational capacity into sustainable economic prosperity is difficult.

For universities, the global challenge revolves less around “better job training” than a fundamental rethink of “comparative advantage”. The west’s comparative advantage, says Richard Freeman, a Harvard University economist, “may come from better leveraging the people who went to our schools and worked in our companies... They want to continue to have strong ties with us”. Mr Freeman and others point out that elite western universities enjoy rich networks of alumni that can be profitably leveraged to attract global talent and resources. Graduates of mid-tier universities will find themselves caught between the prestige degrees that win top jobs and lower-cost talent from Asia and the subcontinent. Their schools will innovate, consolidate or evaporate. So we can expect desperate innovation surges by western universities intent on preserving share. We can expect some bold schools to be as aggressive as Mr Immelt’s GE or Carlos Ghosn’s Nissan in restructuring themselves to serve global constituents. Perhaps successful alumni will serve as “commercial” thesis advisers. Maybe chemical engineering and molecular biology departments will regularly convene workshops where they solicit research agendas from industry.

Without the institutional courage and cleverness to differentiate themselves, will tomorrow's Harvard, Imperial, or École Polytechnique confront a comparable fate to today's General Motors and Ford? Yes. Global commoditisation of higher education and research means even scientists and engineers must better appreciate the economics of supply and demand. ■

The writer holds research appointments at MIT and the Royal Institute of Technology in Sweden; he once ran a global competition requiring doctoral students to describe the potential commercial implications of their thesis research