

# Shanghaiing India's education system

*The fact that the list of 500 top universities has just two Indian institutions points to the big changes that need to be made, says Dinesh Mohan*

About the same time the prime minister of India was giving his Independence Day speech announcing his government's initiatives in a significant expansion of educational facilities at all levels, the Shanghai Jiao Tong University announced the academic ranking of the top world universities on the Internet. In the previous years, only two institutions from India have made the list — Indian Institute of Science and Indian Institute of Technology Kharagpur. Both were clubbed with other universities in the rank 303-401.

This is the sixth year of the Shanghai group's academic ranking of world universities (ARWU). The rankings have had such an impact on the world academic community that now there is an International Rankings Expert Group and an annual International Conference on World-Class Universities to discuss issues and problems associated with academic rankings. This is because ARWU is the only academic ranking for research output that is based on objective data and the process completely transparent.

According to Professor Nian Cai Liu of the Shanghai Jiao Tong University, the ARWU was set up initially to find out the position of Chinese universities in the world and the gap between them and world class universities (WCU). This because the Chinese government had decided that there should be scores of WCUs in China within the next few decades. The first step was to understand what WCUs are and how they perform in terms of research output and achievements of their alumni and faculty members.

The researchers in Shanghai scan data on more than 2,000 institutions, rank more than 1,000 and publish the results of the top 500 on the internet every year. Data are collected on alumni and faculty members of an institution winning Nobel Prizes and other prestigious medals, highly cited researchers in 21 broad categories, number of articles published in Nature and Science (for institutions specialised in humanities and social sciences these are not considered and weight allocated to other indicators), articles published in internationally indexed academic journals, and number of articles per faculty member in the institution.

As in all previous years Harvard University is ranked number one (see box). Out of a total of 500, USA gets 159, Europe 210 (UK-42, Germany-40, France-23, and Italy-22), and Asia Pacific-100 (Japan-31, China-18, Australia-14, and South Korea-7). USA is also home to 17 of the top 20 institutions and 54 of the top 100. Among the middle and low income countries, China does the best, and others in the list are: Taiwan-7, Hong Kong-5, Brazil-4, Israel-6, South Africa-3, Chile-2, Turkey-1. The only comfort we can take is that no country with a per capita income less than \$6,000 per year except China makes the list (India's per capita income is \$820 per year).

What is chastening is that China has been able to place 18 of its institutions in this list in a relatively short



period of time. Obviously, they have instituted serious policies to achieve this and it is time we take a relook at our own policies and understand what makes universities achieve an elite academic status.

There are a few things common among most of the universities that make the top 500 hundred. A vast majority of them are large public universities enjoying liberal funding. Even in the USA, where many private universities exist, over 70 per cent of the universities making the list for engineering sciences are state funded. Even in the private universities, a significant proportion of research funding comes from the public sector. In the middle and low income countries, only state-funded universities are able to do any scientific research of any consequence.

The age of specialised institutions like IITs, IIMs and IIITs seems to be over. A great deal of modern research involves interdisciplinary work and that is why such institutions are the exceptions. If we have to ensure our place in the world of research activity, our institutions will have to be much more broad based and encompass many disciplines under one management. In addition they will have to put in place agreements with neighbouring institutions dealing with other disciplines so that students and faculty members can interact and work with each other.

At present, faculty hiring and reward rules are far too narrow minded to encourage research spanning different areas of expertise. For example, it is almost impossible for someone holding a degree in mathematics or ar-

## THE RESULT

The Top 20 universities

- 1 Harvard
- 2 Stanford
- 3 California - Berkeley
- 4 Cambridge
- 5 Massachusetts Inst Tech
- 6 California Inst Tech
- 7 Columbia
- 8 Princeton
- 9 Chicago
- 10 Oxford
- 11 Yale
- 12 Cornell
- 13 California - Los Angeles
- 14 California - San Diego
- 15 Pennsylvania
- 16 Washington - Seattle
- 17 Wisconsin - Madison
- 18 California - San Francisco
- 19 Tokyo
- 20 Johns Hopkins

chitecture but doing outstanding work on infrastructure issues to get hired by a civil engineering department. One way of encouraging such work is to fund a number of small centres excellence in important areas of national need in all our institutions.

The greatest problem in expanding the number of elite institutions in the country will be the shortage of faculty. The kind of people who take up research and teaching jobs in any country come from middle and lower middle class family backgrounds. They are the ones who look for security in a job and work hard. Those who have spent mon-

ey on education or taken loans are unlikely to take teaching jobs. We will have to reverse the trend of rising costs of education and give liberal scholarships even for living expenses. It is not surprising that even private institutions in the US like Harvard have announced recently that students from families earning less than \$60,000 a year do not have to pay fees. In addition they promise that no one who makes it on academic criteria will be denied an education because of financial hardship.

No changes in our academic institutions will encourage research activity unless there is enough demand for those with Masters and PhD degrees. China produces about 5,000 engineering PhDs a year and all of them get jobs, mostly in the public sector. We produce about 500, and even they don't find it that easy to get placed. Industry alone will not be in a position to increase the intake of highly qualified researchers in a hurry. Our public sector institutions like the railways, NTPC, ONGC, DRDO, municipalities, BIS, building and road departments, etc. must put in place policies to hire such people and give them meaningful jobs to do. These plans must be ambitious so that we can create a large demand as soon as possible. Once this happens, then the collaboration between academic institutions and the service sector will be ensured.

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