The point of multidisciplinary research universities in India

PITFALL A weak research culture in universities has also been a source of concern

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In India, there have been repeated calls for multidisciplinary research universities by leading scientists, most recently by the committee led by Professor Yash Pal (GoI 2009). No action has been taken by the government to date, even though some recognition has been given to the need for the sciences for national economic development..

This is perhaps not surprising. For one thing, it is not easy to develop and sustain a sense of urgency on a matter as 'waffly' as multidisciplinary research universities. Indeed, it is easy to see the questions that could be asked. Exactly why and how important are they? What are the pitfalls, and what are the different approaches possible? And how urgent is the need to get action in place? Can it not wait, given that India is far from being a 'knowledge economy'? The problem is that these are 'system-level' questions, which cannot be answered simply by looking at the Indian scenario alone. To explore the answers to these questions and to come up with options, it is essential to undertake a system-level analysis, not just by comparing India's performance data against those of 'other similar systems' (which often generate nationalistic and simplistic reactions), but by examining the historical experience of system development and their performance in other countries. It is also essential to gain insight into how certain capabilities can be developed over time.
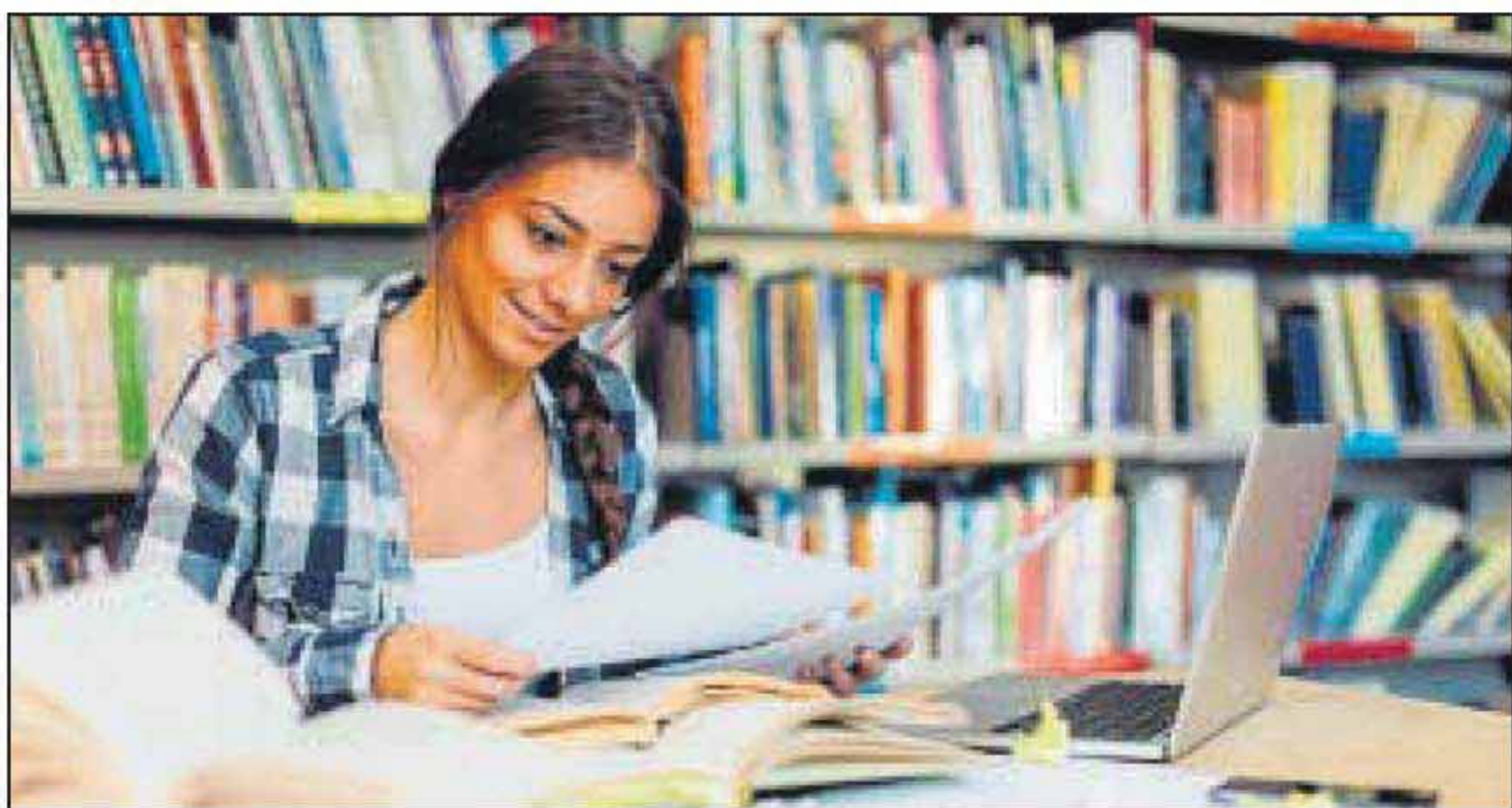
THE INDIAN CONTEXT

India's higher education system is at a crossroads. Today, it is the third largest higher education system in the world, with almost 30 million students. It has a small number of highly selective institutions, well established in their reputation for producing high-quality graduates.

The resulting rich human resource base has enabled India to leapfrog into the modern Information Technology (IT) industry—something that few had predicted. The ensuing economic boom for India comprised not only conventional foreign direct investors coming for cheap labour, but also a number of foreign corporate Research and Development (R&D) laboratories, which came to India for its brains. Notwithstanding such past successes, the road ahead does not look simple. India's higher education system is already one of the most complex higher education systems in the world (Agarwal 2009), with over 700 universities and more than 36,000 colleges, many of which are private and/or affiliated to universities (GoI 2014).

Institutional arrangements are extremely diverse, with interlocking responsibilities and accountabilities at the central as well as state levels.

The complexity unfortunately masks a variable quality in the graduates produced. While the best of the higher education institutions are well-respected nationally and internationally, with their graduates highly sought after in the world's best postgraduate programmes, a large number of institutions are reported to be delivering poor quality education. In 2013, the government tightened the regulatory framework for quality by making accreditation mandatory, a step forward from the past voluntary accreditation system that had been in place since the 1990s. The main remaining issue is the lack of qualified personnel, for both academic and administrative staff.

Fuelling the concern is the ongoing and expected expansion of the higher education sector. India's higher education enrolment ratio reached 21 per cent in 2011–12, rising sharply from 15 per cent reported as recently as 2009–10. The system has been stretched thin through decades of expansion. The annual growth has risen from 5 per cent in 1990–95, to 11 per cent in 2000–05, to over 14 per cent in 2005–10. Only recently have there been signs of slowdown, with 6 per cent reported between 2010–11. The number of students increased by more than a million annually throughout the 2000s. In 2010 alone, which marked the peak of this spurt of expansion, more than 7,000 institutions were newly established.

If the past and ongoing expansion has strained the system, today's acute shortage of high-level skills in the economy are crippling it. Even elite institutions such as the Indian Institutes of Technology (IITs) have found it difficult to recruit staff, with some institutions reporting vacancies in as many as a third of their staff positions (Bagla 2011). Staff shortages are expected to worsen in the future, if the expansion is to meet the government's continuously ambitious target of enrolling 30 per cent of the age cohort of students by 2030, revised upwards from 20 per cent by 2020.

India's Ph.D. output remains small, at 10,000–13,000 Ph.D. graduates in 2008–09. A study had projected that even to meet the government's previous ambitious expansion target of 20 per cent by 2020, about a million new teaching staff would have to be recruited into the sector, which could have taken 50 years at the rate of Ph.D. production at that time (Winkler, et al. 2011)—assuming that they all would have to have doctoral degrees. Given the ambitious target, expansion of Ph.D. training continues to be a high-priority agenda in the minds of many concerned.

A weak research culture in universities has also been a source of concern, particularly amongst the leading scientists, as they see it as the principal cause of poor quality in higher education (Bhattacharya 2011). In India, universities were slow to develop research capacity because of the historical division of labour between national research institutions, which have played the leading role in research, and universities which were developed principally for education. Even the IITs did not develop significant research capacity (Indiresan 2007). Indeed, there is concern that they rarely appear in global university rankings, because of the rankings' bias towards research performance. The Indian Institute of Science, Bangalore, and Punjab University were the best listed amongst Indian institutions in the Times Higher Education rankings in 2014, appearing between the 275th and 300th place; this is to be contrasted with two Chinese higher education institutions listed within the top 100. The weak research in higher education institutions reflects this historical division of labour—as has also happened in many other countries. Over the years, India developed a large national research sector comprising many specialised research institutes, large and small, including both applied and basic sciences, falling under some 12 major scientific agencies. The division of labour between universities with poor facilities and teaching responsibilities, and elite research institutions with no teaching responsibilities, created unhealthy tension, termed 'a two-box disease' by a prominent Indian scientist.

There have been repeated recommendations and initiatives for better integration of research with education, or for improved linkages between the two sectors. However, little change has been accomplished and the two sectors appear to have become 'set in their separation' over time (Bhattacharya 2011; Udagaonkar 1993).

Statistics endorse the dominance of the national research institutes. While India's national investment in R&D is small by OECD standards (averaging 0.9 per cent of the Gross Domestic Product [GDP] in recent years), the central government research sector has the largest share (over 50 per cent), whereas higher education's share has been less than 5 per cent (GoI 2015). Of the total R&D manpower, about 30 per cent were working for major scientific agencies and their institutes, with less than half the number in the academic sector.

This is not to say that there are no signs of better integration of research and education. On the one hand, the Indian Institutes of Science, Education and Research (IISER) have been introduced as new institutional models, with education as well as research as an explicit part of their institutional mandate. On the other hand, leading national research institutes have initiated visible steps to take on greater Ph.D. training roles by officially adopting 'deemed university' status.

Although government funding of research is by no means stable yet—as witnessed by the bonanza years in the late 2000s, followed by the 'austerity' years starting in 2012 (Jayaraman 2009, 2012, 2014; Nayar 2011; Padma 2015)—the general thrust has been towards increasing 'extramural R&D support', which has been largely competitively provided, with higher education institutions taking the lion's share of such support. The portrayal of India's systemic issues, as above, is based on many assumptions. The first step must be to examine the validity of such assumptions in light of the international system experience. For instance, should there be a systemic basis for establishing expansion targets? Should research capacity be an aim for all higher education institutions? Will having enough Ph.D. graduates really solve quality issues for the entire higher education system? Even the simple sums that show that Ph.D.s cannot be produced fast enough to support the expansion seem disingenuous, given that many higher education teaching staff did not have Ph.D.s before the expansion. It may be easy to say that research capacity would be good to have for the future, but given India's complex development needs, can we be sure that it is a priority for today?