

Internationalization of Indian higher-education

I have been following the editorial by Lavakare¹ and the follow-up commentary by Altbach² on the internationalization of Indian higher education in the recent issues of *Current Science*.

As one who was involved in teaching in an Indian university college for a little more than two decades before migrating to Australia, I think I am qualified to share my thoughts. I am fully convinced that India has the potential to offer higher education and training to learners from neighbouring countries (e.g. SAARC nations) and those a little far (e.g. Indonesia, the Middle East and Africa). Many of these nations recognize, respect and regard the academic titles from India well. A few from wealthy nations may not prefer to come to India for higher learning. But then, internationalization as proposed by Lavakare¹ need not mean learners from wealthy nations only coming to India for academic titles.

Nevertheless, Altbach's² comments are true in that Indian education administrators and academics involved in the process need to consciously and conscientiously tighten up the loosened quality on the teaching–learning process. I am aware that an edifice called National Assessment and Accreditation Council (NAAC) exists today, but I am afraid that the opinions I hear of the manner in which the Council functions are not pleasant. Anyway, I do not want to go into the functioning of NAAC here.

I will offer a few of my thoughts following those of Lavakare¹ and Altbach². Higher education, similar to medical facilities, whether be in India or elsewhere, has become a commercial enterprise. We 'sell' information through colleges and universities. They are business enterprises today throughout the world. None can deny this. But within that shell of commercialization (e.g. 'XXXX University', Inc. emphasis on 'Inc.'), teaching–learning practice needs to grow and perform better in India.

I do not want to talk about Indian institutions 'better known' in the world. The woeful and realistic tragedy is, if the US knows, then the assumption is that the world knows. That is myth.

Colleges and the mushrooming universities need to change their teaching–learning practice. They need to exercise better quality control measures. For instance, teachers need to teach effectively, teach relevant materials and at the same time excite learners to learn and build capability in themselves and by themselves, so as to be able to practice in unknown future contexts with confidence. In one word, teachers need to be inspiring³. By and large, effective teachers at university and college levels are the biggest deficiency in India. Customarily, most of the Indian academics today think that perpetuating rote memory-based learning is the best teaching practice and Indian education administrators encour-

age the same. A person who manages to get grants for a couple of projects (how he/she manages them is another debatable point) is seen as the embodiment of knowledge in Indian universities and colleges. That is 100% false. An effective teacher need not be a grant-getter.

In short, India indeed has the potential to attract international learners from far and near. In the last few decades, our practices in teaching–learning have degraded. We are consciously and systematically choosing to ignore the elephant in the room.

1. Lavakare, P. J., *Curr. Sci.*, 2017, **113**, 2225–2226.
2. Altbach, P. G., *Curr. Sci.*, 2017, **114**, 425.
3. Raman, A., *Curr. Sci.*, 2015, **108**, 1197.

ACKNOWLEDGEMENTS. I thank Marthandavarma S. Valiathan (former Vice-Chancellor, Manipal University, Manipal), Sr Annamma Philip (Xavier Board of Higher Education in India, Bengaluru), Sanjay Pai (Columbia Asia Referral Hospital, Bengaluru), and Sreenath Subrahmanyam (Center for BioEco-Sciences and Technology, Maryland) for their helpful comments on the draft text.

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Transforming science and technology in India

For the first time, the Economic Survey of India has introduced a chapter on science and technology¹. It emphasizes the point that as India emerges as one of the world's largest economies, it needs to gradually move from being a net consumer of knowledge to becoming a net producer.

Of particular interest to the present author is the underlying message of table 3 of the 2017–2018 report on investments in R&D. Table 1 summarizes data from table 3 of the report. The two key

inputs are trained scientific manpower and gross expenditure on research and development (GERD). When countries or economies have to be compared, it is meaningful to express these as dimensionless numbers. The Economic Survey of India does this – we have the ratio of researchers per million population and the ratio of GERD as a percentage of GDP displayed in table 3 of the report. One can compute a leverage term as the ratio of ratios: $l = (\text{GERD}/\text{GDP})/(\text{researchers}/\text{population})$. This is shown in

the last column in Table 1, while Figure 1 is a plot of the dimensionless parameters.

We see from Figure 1 that India needs a leverage term that is nearly an order of magnitude larger than that of Israel or the United States. These trends have been previously reported². Note that the dimensionless leverage term $(\text{GERD}/\text{GDP})/(\text{researchers}/\text{population})$ can also be expressed as $(\text{GERD}/\text{researchers})/(\text{GDP}/\text{population})$. In other words, the leverage term l is a measure of the multiple

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Table 1. Extract from table 3 in chapter 8 of the India Economic Survey of India¹

Country	Researchers/million inhabitants	GERD/GDP (%)	Leverage
USA	4,231	2.8	6.62
Israel	8,255	4.3	5.21
China	1,113	2	17.97
India	156	0.8	51.28

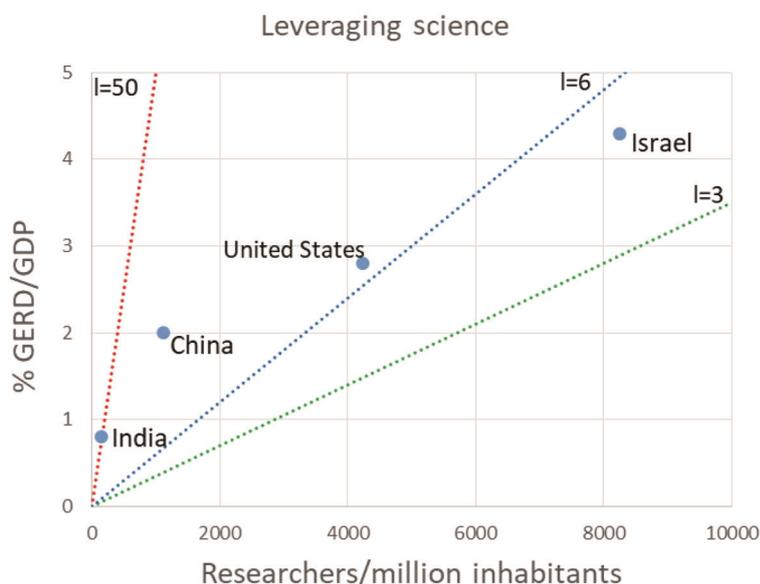


Figure 1. India needs a leverage term that is almost an order of magnitude larger than that of Israel or the United States.

of the per capita income of a nation that its R&D workers (total of salary and infrastructure costs)².

Three dotted lines are shown in Figure 1, of which the line corresponding to $l=6$ is a notional ideal for developed countries – about 3% of GDP should be spent on R&D and about 0.5% of the population should be engaged in R&D activities. As reported by Prathap², this ideal was nearly met by developed economies like South Korea, Japan, the US, France, and the EU taken as a whole. Brazil, China, India and South Africa had appeared on an arc of much higher leverage, with India having the highest leverage of nearly 56. One can speculate that this very high leverage term could mean that India's R&D spend is being managed unwisely and inefficiently.

1. <http://mofapp.nic.in:8080/economicsurvey/> (accessed on 30 January 2018).
2. Prathap, G., *Curr. Sci.*, 2014, **106**(3), 374–377.

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Corrigendum

Inter-specific relationship of size and walking speed in predaceous ladybirds (Insecta: Coleoptera: Coccinellidae)

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[*Curr. Sci.*, 2018, **115**, 141–146]

The following corrections are suggested in citations nos. 11 and 32.

11. Schmitz, J., Gruhn, M. and Büschges, A., The role of leg touchdown for the control of locomotory activity in the walking stick insect. *J. Neurophysiol.*, 2015, **113**, 2309–2320.
32. Silva, J. A., Monteiro, A. B., Maia, L. F. and Faria, L. D. B., Morphological traits, allometric relationship and competition of two seed-feeding species of beetles in infested pods. *Rev. Bras. Entomol.*, 2017, **61**(3), 243–247.

We regret the errors.

– Authors