Academic degrees and unemployment

The recent notifications regarding vacancies for street cleaning/peon/porter jobs in Uttar Pradesh (UP) evoked tremendous response reflecting on the prevailing unemployment situation in the country. It is a serious matter when applicants for such menial jobs are doctoral degree holders, engineers, lawyers, MBAs and postgraduates and graduates. For instance, MBA/B Tech/doctoral degree holders were among 17,000 candidates who applied for 114 posts of sweeper in Amroha Municipal Corporation[1,2] in 2015. In September 2016, for 368 posts of peon in UP Secretariat, among 23 lakh candidates 150,000 were graduates, 24,969 were postgraduates and 255 were doctorates[3]. In Maharashtra, for porter job, the State Public Service Commission received applications from five M Phil degree holders[4]. There is no harm, if by choice, one does such work. In a social milieu where a degree is considered as a gateway to a white-collar job, graduates or doctorates applying for such menial tasks indicates their fight for survival and job security.

Though a small fraction of students may be opting for such jobs, this reflects the deplorable condition of our academic system. Obviously, there is a big gap in what is offered to have and what is delivered.

Doctorates earn their degrees after four/five years of work under a supervisor, followed by more or less similar due evaluation process. If they do not get suitable jobs, the blame should be shared by both the candidates and their supervisors, as they work in close unison. Poor capabilities of both parties concerned, coupled with unprofessional or casual approach of evaluators are responsible for the sorry state. In some cases, universities are also actively involved in offer for financial considerations[5]. If candidates with questionable competence join academics or research fields, then they would be a liability in the system. UGC's regulations to improve the situation, viz. conducting entrance exams, pre-Ph D lab courses, registration by research degree committee or by a board of study, progress reports, etc. resulted into counter effects making the system slower, and with more bureaucratic hurdles. To improve the situation, only capable faculty should be permitted to guide students with simple procedure of admission and doing away with the pre-Ph D courses which serve no useful purpose as they are not taken seriously by either the faculty or scholars. Instead, scholars should spend time in the library preparing reviews of reference books and published papers, and in the laboratories to get familiar with instruments and experimental techniques.

Liberalization in academics suddenly opened a vast field of fortune with low investment. In a short time, colleges and universities had started all over the country, many of which were not properly equipped with faculty, instruments, library and other infrastructural facilities. The nexus between such institutions and authorities made it convenient for students with poor academic credentials to get a degree. Demand and supply have forced a good number of colleges every year to either exit (100 engineering colleges in 2016) from the system[6], or turn to basic fields of science, arts and commerce. Most of the government-owned institutes are in a bad position due to lack of accountability at all levels, despite far better pay packages.

The rot in the system needs to be tackled firmly to make it accountable and transparent by convergence of approaches of all stakeholders, viz. policy makers, academic administrators, regulators, universities, associations/unions, teachers, students and parents. Identification of the malaise and corrective measures and their implementation would be a tough and time-consuming process, and doors have to be shown to questionable performers, be they institutions or individuals.

1. http://indianexpress.com/article/education, dated 22 January 2016
2. http://catchnews.com/india-news, dated 25 January 2016.
3. http://hindustantimes.com, dated 17 September 2016.
4. http://indiatoday.intoday.in, dated 21 June 2016.
5. http://dawn.com/news, dated 2 June 2013.
6. http://economictimes.com/education, dated 24 May 2016.

A. K. BIYANI

Department of Geology,
DBS (PG) College,
Dehradun 248 001, India
e-mail: biyani_ajay@yahoo.co.in

Interdisciplinary research: a twilight area in Indian institutions

Daniel and Srivastava[1] have aptly described the problems faced by expat Indian scientists opting to return to India after their research training and experience abroad. I agree with the authors that the Indian universities do not teach innovative and interdisciplinary courses at the Master's level, and there is lack of faculty positions to promote research guidance in interdisciplinary and multidisciplinary areas. The authors have also proposed globalized reverse migratory scientist recruitment initiative scheme for direct admission of eligible visiting Indian scientists from abroad and persons of Indian origin.

The situation in India will change sooner or later as innovative research demands knowledge of multidisciplinary areas. For example, the advent of nanotechnology has removed this barrier of monopoly in both teaching and research in universities and paved the way for interdisciplinary research. Most universities have set up infrastructure facilities as a common pool to cater to the needs for inter- and cross-disciplinary research. IISc, Bengaluru is the first institution in India to recruit faculty in multidisciplinary areas. There is hardly any such appointment made in Indian universities and IITs. However, this practice is quite common in universities

of Europe and USA in order to promote interdisciplinary research.

During 1970s, when I returned to India after my doctorate in high-energy nuclear physics abroad, the situation was much worse. There were no high-energy accelerators in India for doing irradiation experiments on-line. So I decided to undergo training in radiation biophysics under G. N. Ramachandran at IISc in 1974, but I failed to get a research project of my choice. Then, I shifted to geochronology and ultimately settled down in geophysics. However, I was at a disadvantage during interviews for promotion and when being nominated for Fellowships to the various Science Academies, as the selection committees failed to appreciate my contribution in an interdisciplinary research area. The Department of Physics, GND University, Amritsar took the initiative to introduce interdisciplinary courses at the Master's level in geophysics, energy sciences, applied physics, and history and philosophy of science during 1980s.

I support the arguments of the authors[1] to introduce interdisciplinary courses of study in Indian institutions. The proposal for Direct Recruitment of Highly Skilled Repatriates Abroad (DRHSRA) would go a long way to fulfil the needs of expat Indian scientists opting to return to India.

1. Daniel, R. S. and Srivastava, A., *Curr. Sci.*, 2017, **112** (5), 904–905.

HARDEV SINGH VIRK

PDP Department,
Punjabi University,
Patiala 147 002, India
e-mail: hardevsingh.virk@gmail.com

Making progress, but not rapidly. Comparison between India and China

I read the article by Arunachalam *et al.*[1] on 'Chemistry research in India: making progress, but not rapidly' with interest. The comment 'making progress, but not rapidly' perhaps applies to Indian science as a whole. It is also appropriate to compare the Indian performance with that of the Chinese. In the 1980s, I recall an internationally acclaimed science journalist describing India as the superpower of Third World science. That is no longer true. China has progressed by leaps and bounds, and has left us far behind. I would like to submit that one reason, probably the primary reason, for this disparity is the difference in the level of support for science in the two countries. Around 1990, the R&D expenditure in China and India was at a comparable level. The situation is entirely different today. In 2015 the R&D expenditure in India was 0.85% of the GDP, whereas it was 2.1% of the GDP in China. In the same year, the GDP of China was nominally 5.06 times that of India[2]. On PPP terms, the ratio was 2.39. Thus the R&D expenditure of China was 6–12 times that of India, depending on the way GDP is estimated. This disparity in financial input needs to be taken into account when comparing the performance of the two countries. Post World War II, science has become a highly organized effort and performance substantially depends on the level of funding[3]. Therefore, in terms of funding itself, it is not surprising that China has outperformed India so substantially in recent years.

I do not suggest that funding is the only issue. There is much else that we need to do to improve our performance in scientific research. I have already dealt with some of the issues in a few recent articles in *Current Science*[4–7].

Obviously I am not intimately familiar with Chinese science. However, I have formed some impressions about the organization and direction of Chinese science from the half a dozen visits that I have made to China during 1986 to 2011, and the detailed discussions I have had with Chinese scientists. Interestingly, the period of my visits roughly corresponds to the period in which China leapt forward from the status of a developing country to that of a superpower. One of the aspects which impressed me is the consistency with which science was supported in China. On the contrary, during the same period we went through a roller-coaster ride with ups and downs in support for science in our country[8]. The scale at which Chinese operate is also different from what we are used to. Even our premier institutions of science like the Indian Institute of Science, Indian Institutes of Technology and Tata Institute of Fundamental Research are small in size by global standards. Most other scientific institutions in India are in my opinion subcritical in size. We need to scale up our scientific endeavour. Furthermore, it appears to me that the Chinese strategy has been to harness all available talent, irrespective of age. We tend to pose the issue as young versus old, while it should be young as well as old. Youth and experience are complementary and need to be harnessed simultaneously. It is also important to promote talent wherever it is available. Furthermore, the effort should be to support and fund 'all' projects which have been adjudged worthwhile by peers. This would not involve spreading the butter too thin, as the number of available worthwhile projects is not all that many. In any case, the availability of butter should be much higher than what it is today! Only then we can unleash the creative potential of Indian science.

To sum up, it is desirable to take into account the level of support and working conditions when assessing performance.

1. Arunachalam, S., Madhan, M. and Gunasekaran, S., *Curr. Sci.*, 2017, **112**, 1330–1339.
2. https://en.wikipedia.org/wiki/List_of_countries_by_research_and_development_spending
3. Vijayan, M., *Frontline*, 4 December 2009, pp. 96–99.
4. Vijayan, M., *Curr. Sci.*, 2011, **100**, 815–816.
5. Vijayan, M., *Curr. Sci.*, 2011, **101**, 605–606.
6. Vijayan, M., *Curr. Sci.*, 2012, **102**, 377–378.
7. Vijayan, M., *Curr. Sci.*, 2015, **108**, 775–777.
8. Vijayan, M., *Curr. Sci.*, 2015, **108**, 1575–1576.

M. VIJAYAN

Molecular Biophysics Unit,
Indian Institute of Science,
Bengaluru 560 012, India
e-mail: mv@mbu.iisc.ernet.in