

Women leaders in Indian science

The academic community has a skewed gender ratio, which gets worse when the focus shifts to leadership. How many Vice Chancellors of Central Universities or Directors of Institutes of National Importance are women?

To increase the number of girl students and consequently women academics in science and engineering, we need to ensure that: (a) there are leaders for the students to talk to and perhaps emulate and (b) there is no glass ceiling for women academics administratively.

A 5-year target in this regard would be to aim for 30% women Directors amongst the IITs, IISERs and research laboratories under the DST, DBT, CSIR, ICMR and DAE umbrellas. In this correspondence, I focus on three points:

(1) Many institutions now offer tenure-clock stoppage to women scientists on maternity leave. When the clock restarts however, the woman scientist is already junior to colleagues who were recruited with her (junior as measured by years-of-service or publications). This implies a delayed promotion and poorer

chances of becoming Chair or Dean, positions which provide some of the visibility associated with future Directors.

A solution to this is to consider her for promotion along with her batch of recruits but associate a 3/2 multiplicative factor to the work she completed during the period considered for evaluation. For example, a woman scientist who published four papers in a five-year period (that included a maternity break of 6 months) should be treated as having six publications by the promotions committee, which would likely put her on par with her peers. Clearly, such a multiplicative factor will have to be carefully tuned based on subject area and institution. This process will ensure that maternity leave and loss of seniority are no longer synonymous. Such an approach will reassure women scientists that they need not choose between career advancement and having children.

(2) A related point to the one above is that women often lose valuable research time in activities relating to child day care. It was recently brought to my

notice that in Europe, women researchers fought for and won the right to use a portion of their research funding for child care (in meeting expenses for baby-sitting during conferences for example). This is also a recommendation of the Shahid Jameel committee report for DBT. Indian institutions should go the extra mile and provide not just a crèche, but also a few qualified child-care workers. This will allow faculty to leave their children in a safe environment and focus on research, teaching and attending meetings, they would otherwise be forced to skip.

(3) Women must be well represented in the Board-of-Governors or equivalent governing bodies of all institutions. Again, 30% would be a reasonable target to start with.

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Need for reforms in our education system

The guest editorial 'Who are people of genius?'¹ seeks, *inter alia*, to underscore the need for 'foreign universities to set up their campuses and let them bring another dimension to our education system'.

After independence, India committed to develop a democratic, secular, egalitarian and just society was expected to formulate an education framework accordingly. Unfortunately, no serious and well-articulated steps appear to have been undertaken for the purpose all these years. Right to elementary education took more than 60 years to be enforced, that too with a lot of shortcomings.

Doubtless, a large number of educational institutions at all levels have been established under state initiative and there are some world-class centres too. But most of the remaining lack proper planning and infrastructure. Pro-profit private education providers, once condemned by all right thinking people and

even by the Supreme Court, have proliferated. They, of necessity, had to have a not-for-profit tag. According to the 12th Plan estimate, more than half of the children would take admission to private primary schools by 2018. In 2007, 70% of the secondary schools were under private management. In 2011–12, privately managed higher educational institutions constituted around 64%.

Quality of education at all levels is below standard in general. There are few centres of excellence in higher education like IITs, IIMs, NITs, etc. and the government is trying to highlight them by increasing their number. But many of them lack proper facilities and infrastructure.

The new HRD Minister Smriti Irani, immediately after taking charge declared to set up eight new IITs. But students from the older IITs in an on-line petition addressed to the Minister sought that the

infrastructure of existing 16 IITs be strengthened and upgraded first, before new institutions are started. Eight IITs set up in 2009 have yet to shift to permanent campuses.

In 2009, the then Prime Minister Manmohan Singh during his convocation address at the Banaras Hindu University, Varanasi observed: 'two-thirds of India's universities are providing sub-standard education while 90% colleges are below average'.

Among the emerging economy BRICS countries, India is the poorest performer in almost all social welfare parameters such as human development, adult literacy, average number of years of schooling, under-5 mortality rate, gender inequality, maternal mortality rate, etc. All this seems to be the fallout of our government's desire to convert, as much as possible, our education system into a trade item through privatization and PPP drive

only to siphon public funds and transfer public assets to private agencies and to thereby 'bring another dimension to our education system'.

How can the proposed reforms in higher and other sectors of education help develop an egalitarian and just society? Common school and neighbourhood school system and the likes are now a

long bygone dream. Until good quality education is generally available and promising students are given an opportunity to continue their education allowing reputed foreign universities to set up campuses here can hardly improve the situation, for, only a small fraction of the 'people of genius' would be able to get entry there.

1. Shashidhara, L. S., *Curr. Sci.*, 2014, **107**, 731–732.

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Challenges and opportunities in drug discovery and development

The guest editorial by Vishwakarma¹ on modern drug discovery and the Indian opportunity is a good presentation of the perspective and what needs to be done in India to evolve the culture of drug discovery and development. Today, India is one of the biggest producers of generic drugs, which is an outcome of the patent laws drafted in 1970 in order to protect our population. Though this blunted our efforts in the area of drug discovery, it resulted in the creation of robust capabilities in mass production of well known and characterized chemical entities; an example of opportunity in a 'crisis'. By signing the patent laws in 2005, the opportunity of reverse engineering and tinkering with the molecule no more exists with respect to newer drugs. The author has rightly pointed out that currently there are no major drugs in the pipeline with giant pharma players for the diseases important to India and the developing world, a crisis which can be converted into an opportunity by embarking on drug discovery and development with a greater new zeal. Though it may sound paradoxical, this lack of new drugs on the horizon overlaps with several advances made in chemistry, biology and medical sciences in the last ten years or so. Exploiting these advances in drug discovery and development for India-

centric diseases and health issues is important and provides great opportunities.

The human body is a wonderful combination of biology, chemistry, physics and engineering and, of late, microbial ecology. Such a wonderful system needs external intervention for correction at times using one or a combination of the above-mentioned disciplines and drugs top the list. All the drugs in use as a cure for diseases (pathological or physiological) affecting the human body, are chemical entities, inspired or derived from naturally occurring molecules. What wheels are to transportation, chemistry is to drugs and nutrition, food, etc. Additionally, stem cell therapies, still in the evolutionary phase, have also added a new dimension to the drugs and health care.

In the present scenario, due to its established institutions and human resources, India has a unique opportunity in drug discovery and development, which does not exist elsewhere in the developing world. Our strength in chemistry, biology and health sciences can contribute substantially in drug discovery and development. India also has its own systems of medicine and there is an immense possibility of fruitful cross talk between the two systems, which are not mutually exclusive; in fact, they can synergize and result in useful products in the years to come.

The other most important point raised by the author is the collaboration, which is the biggest hurdle to circumvent under the present set-up. Most of us still believe that if our institutions are aligned in a seamless manner together they can deliver anything; a will to make that happen is needed. If such a robust performing platform is created, it will also induce/attract pharma industry to join the bandwagon with a visible effect in 5–10 years time.

The possibility of evolving an entirely new regional drug policy to safeguard regional interests of SARC countries needs attention. I share with the author, the optimism he has projected for the future, but for this to happen would require paradigm shift(s), which should be possible with proactive support from the top leadership in the Government of India, policy makers in S&T institutions and participation of academia and industry. A new work culture for drug discovery and development is needed, amounting to putting the horse in front of the cart!

1. Vishwakarma, R., *Curr. Sci.*, 2014, **107**, 335–336.

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Evaluating scientists and 'impact factor'

What was the impact factor of journals in which findings of green revolution, white revolution, pink revolution, etc. were published? Further, in the present times, rightly, there is an increased demand to publish research in open access journals. Now if all research work is published in the open access journals which are freely

available, the impact factor of all research work would go sky high making this parameter absurd. It is therefore time to reexamine the value of the 'impact factor' and develop criteria to evaluate scientists based on their abilities and enterprise and not on the 'impact factor'.

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