

In Stanford ranking, hope for Indian science



Its grading of scientists could provide much needed impetus in the backdrop of the National Research Foundation plan

It would be quite relevant to recollect these words now: 'India is at the origin of everything; intellectually, religiously or politically where even the Greek heritage seems pale in comparison'. Ancient India has made contributions to several complex and present day scientific achievements. But these words spell some hope as far as the apparent dip in the performance of Indian scientists in the contemporary world is concerned. If one is to look at a new report, by Stanford University, U.S. on the world ranking of scientists it paints a positive picture and shows there are definite signs of Indian scientists regaining lost ground.

A COMPREHENSIVE DATABASE

Scientists at Stanford University, led by John Ioannidis, have created a database of 1,59,683 (top 2%) scientists of the world ([https:// bit.ly/2JAQBzY](https://bit.ly/2JAQBzY)), based on standard indicators such as information on citations, h-Index, co-authorship and a composite indicator. This database has largely depended on the citation index provided by resource databases such as Scopus and Web of Science. It is based on the number of research papers published, the number of times the author has been cited and the h-index, which is a measure of the impact of an author's work and other people's research. There is no other database that systematically ranks all the scientists across the world with such accuracy and depth. From India, 1,594 Indians have made it to the list of top 2% scientists in the world.

An appraisal of the report, which includes disciplines of science, technology, medicine and allied areas, shows certain significant trends. Scientists from government supported institutions have shown supremacy in the disciplines of science and technology, whereas scientists from private institutions find more place in the disciplines of medicine and allied areas. An analysis of the report shows that there is an equitable distribution of scientists working in institutions in urban and rural areas. In certain disciplines, a large number of scientists have secured a place in the list, whereas in some disciplines, only one scientist could be included.

GOVERNMENT INSTITUTES SCORE

From the entire list of disciplines, one finds that more than four fifths of the scientists are from government supported institutions that include institutions of national importance, central universities, State universities, and government funded research institutions. Among the institutions of national importance, several scientists from the Indian Institute of Science, Bengaluru, the Indian Statistical Institute, Kolkata, and the Indian Institutes of Technology and

the National Institutes of Technology have made it to the top. The University of Delhi and the University of Hyderabad find inclusion. In the disciplines of science and technology, the share of scientists from government supported institutions, especially the institutions of national importance, is very high as they feature in most of the places in the list. The conclusion is that the listings point to the outcome of freedom, flexibility and facilitation to the faculty in these institutions to carry out research on any relevant topic. The practices of peer review, motivation to participate in international seminars, and incentivisation packages offered in these institutions are sure to have had a positive impact in this connection.

OUTSIDE THE URBAN HUB

A number of scientists from private colleges and other institutions even from the remote areas have managed to find a place in the list. This is noted in a number of conventional and modern disciplines, thereby showing the reach and the extent of the performance of these scientists beyond the centres of excellence. One also finds several institutions located in remote areas — much away from the ‘urban hubs of education’ — being listed. It highlights the professional excellence and equitable sharing of excellence in the rural and urban settings. The reading of this is that this could act as a great incentive to many rising scientists from the rural areas.

Scientists working in nongovernmental organisations, and private institutions have also made it to the list consisting of science, technology and medicine. In disciplines such as general and internal medicine, anatomy, ophthalmology and optometry, nutrition and dietetics, etc., scientists from private institutions find mention. This points to the need for reorienting and taking a relook at the investment in research and development by government medical institutions. The Medical Council of India, the Pharmacy Council of India and other regulatory institutions would need to review their guidance and support mechanisms for enhanced research and development.

In disciplines such as applied physics, artificial intelligence and image processing, mechanical engineering and transportation, organic chemistry and polymers, one finds more than 50 but less than 100 scientists in the list. It is a matter of great pride that so many Indian scientists from these disciplines have received international acclaim and recognition which is a motivating factor for a number of young scientists. At the same time, it is disappointing to note that only a few scientists in disciplines such as anesthesiology, applied mathematics, emergency and critical care, genetics and heredity and geology have made the grade. It is a signal to these scientists to work harder, with purpose, and to demonstrate professional excellence. Drawing inputs from the National Education Policy, the Government of India has proposed the setting up of a National Research Foundation, or NRF. India invests less than 1% of its GDP in research and innovation.

RELEVANCE OF THE NRF

The proposal to set up an NRF is aimed at boosting research and innovation in all higher education institutions in the country. If it sees the light of day, it would boost the overall research ecosystem in the country by focusing and extending support to take up research and development in thrust areas relevant to India's national priorities. As in the proposal, the NRF will have four major divisions such as sciences, technology, social sciences, and arts and humanities. Additional divisions such as agriculture, environment, etc. could be added by the governing board of the NRF.

The NRF paves the way for a self-reliant India while advocating merit based but equitable peer-reviewed research funding, an incentivisation of research, and to usher in a new culture of research and development in the country. Despite certain limitations, the announcement of the NEP and the Atma Nirbhar Bharat Abhiyan may enable the country to redraw the contours of research beyond the conventional disciplines. The report by Stanford University provides the impetus to Indian scientists to reach international standards.

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