

Mapping academic recognition to research area performance

The Shanti Swarup Shanti Bhatnagar (SSB) Prize for Science and Technology and election to the various learned societies or academies of science are among the highest academic recognitions accorded to a scholar in India. Since its inception in 1958, the SSB Prize has been awarded annually for outstanding research in seven broad areas, viz. biology, chemistry, geosciences and environmental sciences, engineering, mathematics, medicine and physics. The Indian National Science Academy (INSA), New Delhi, elects Fellows every year under ten areas of classification: agricultural sciences, general biology, chemistry, earth and environmental sciences, engineering and technology, mathematical sciences, physics, molecular and cellular biology, biomolecular, structural biology and drug discovery, and health sciences.

The method of election or selection is simple, i.e. an even distribution among the

various areas, and has largely remained the same since the 1930s (when the first academies were founded) or the late 1950s (for the SSB Prize). However, research has now stratified and the bulk of India's research is at present in engineering, materials science and information technologies. I have written about this earlier in these pages: a proposal for rationalization of the SSB Prize scheme using Essential Science Indicators (ESI) data¹, a revised proposal for rationalization of the SSB Prize scheme using CWTS Leiden data², and more recently, a better scheme of election to INSA³ using excellence mapping data⁴⁻⁸.

The latest UNESCO Science Report reveals the scientific publications in India by broad field of science, for 2017–19, as actual volumes of publications and percentage shares⁹. It uses the Scopus database (excluding arts, humanities and social sciences) and the data treatment is done by

Science-Metrix, an internationally recognized leader in assessing science and technology policy and activities using bibliometric methods. In Table 1, we map the sections of INSA and the shares of India's publications over the period 2017–19. A mapping along similar lines can be done for the SSB Prize scheme as well. According to earlier studies¹⁻⁵, engineering and technology as well as information and communication technologies account for about half of the contemporary scientific effort in India. Only a token presence is felt in biological sciences, and earth and environmental sciences. However, the election and selection practices for academic recognition of the highest order continue with nearly century-old prejudices.

Table 1. Mapping the sections of Indian National Science Academy (INSA) to the shares of India's publications over the period 2017–19

INSA section		UNESCO Science Report		
Section	Share	Broad field of science	Volume	Share
Agricultural sciences	2.84	Agriculture, fisheries and forestry	12,653	2.84
General biology				
Molecular and cellular biology				
Biomolecular, structural biology and drug discovery	3.30	Animal and plant biology	14,716	3.30
Chemistry	9.89	Chemistry	44,098	9.89
Earth and environmental sciences		Geosciences	3442	0.77
	3.67	Environmental sciences (excluding geosciences)	12,911	2.90
Engineering and technology		Built environment and design	4940	1.11
		Cross-cutting strategic technologies	115,510	25.92
	37.24	Engineering	45,517	10.21
Mathematical sciences	12.13	ICTs, mathematics and statistics	54,055	12.13
Physics	11.39	Physics and astronomy	50,753	11.39
Health sciences	19.54	Health sciences	87,095	19.54
Total	100.00	Total	445,690	100.00

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