



Leading Science and Technology: India Next?
by Varun Aggarwal Published by SAGE
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What has science delivered to the nation? Have all the investments made in the name of science and technology actually paid any dividends, or has it been a one-way street, with India spending its hard earned tax rupees to fund a largely non-productive enterprise?

Such questions are frequently asked and not just by civil society. The Indian National Science Academy (INSA) has very recently published a book titled “Indian Science Transforming India: Impact of Science in Independent India” with the stated aim of informing the general public and policy makers the quantum of contributions that Indian science has made to the Indian economy and the general well-being of the nation since independence. As they state explicitly,

“The very purpose of publishing this book is to communicate directly to general public the importance of science to the society. Each story in this book narrates how

our education and research in science and mathematics has provided the necessary scientific and technical capabilities required to develop, adopt, modify, and improvise technology for public good. Many stories in this book recognize importance of research and education in basic science and mathematics, further strengthening of which has been the focus of the Academy.”

Some of the same motivation lies at the heart of Varun Aggarwal’s book which aims to understand and analyse the true status of Indian science and innovation. Varun brings three personae to the table in this discussion. First there is the techie student, graduated from Delhi University. The second is the MIT researcher. And finally, the entrepreneur and founder of the startup Aspiring Minds.

The book itself, the result of some years of research, first analyses the actual state of research in India. The main comparison points are with the US and with China, and in chapter after chapter, Varun shows just how far behind the Indian research enterprise is. The analysis is backed up with data (although some of it is dated), but the figures are compelling, and it is made amply clear that academic research in India suffers from lack of funding, lack of innovation, lack of creativity, and a general lack of standards.

In this respect this book differs from the INSA publication that is basically a summary of eight success stories. Whether it is the seemingly innocuous account of the indelible ink that is a feature of all elections in India, or the obviously profoundly useful development of plastic bags that makes possible the storage and safe transport of human blood for hospital use, all the stories in Indian Science Transforming India are of the winners.

Aggarwal’s concerns are of the poor levels of Indian research and translation. At the same time, the general optimism of the author is made abundantly clear, page after page. The book starts with an introduction to how research is assessed, from impact factors to *h*-indices, papers, citations, the works. Aggarwal correctly assumes that most of the readers of the book will not be au fait with all the terms that get bandied about, and he explains these in some detail. In the ensuing analysis, India comes out quite poorly, be it in papers published, high-quality papers published, patents, research investment, university structure, and so on. Since there is ample data to back the critique, there is

not much to say other than much of this is really quite well known and that the data is somewhat dated.

Where Aggarwal makes a somewhat original contribution is in his final chapter, on a vision for what should and could be done. As Desh Deshpande, author of the foreword points out, he enunciates “Sixteen well thought-out principles for invigorating India’s research ecosystem”. Even though many of them will not be surprising to researchers in India, it may well strike policy makers and others as novel, and in the bargain may well be one of the most useful things about the book, that it introduces the general public to the challenges of what it takes to do high-quality science and to deliver the kind of cutting-edge results that can make a serious difference to society.

Mr. Aggarwal should be congratulated for articulating the issues so clearly, succinctly, and with candour. For instance, he frankly admits in the blurb, “Is India a front-runner in creating new knowledge and world-changing inventions? The answer is unfortunately, No.” One can only hope that both the funders of science and the practitioners will take serious heed and see what can be done to improve the situation, and to reverse this statement. □

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