Research publications and India

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India is moving ahead in science and research publications. According to a recent article published in the *India Education Review*[1], the number of research articles published by Indian authors has been increased significantly in the last four years. The scenario speaks about growing active contributions from the Indian researchers. The rate of growth of publications from India is even higher than that of China, Brazil, Russia and the UK. This has been mentioned in a report by Elsevier[2], submitted to UK's Department of Business, Innovation and Skills recently. The evaluation was primarily based on the *Scopus* data. The inventions as evident from the publications from India are primarily in the fields of medical science, molecular biology, bioinformatics, drug designing, chemical Science, biometallics, nanoscience, nanobiotechnology, etc. Engineering science has outstanding contribution in the increasing rate of research publications from India, while publications in mathematics from India are not much promising[3].

India stands ahead of Japan in citation of publications in engineering science. India holds a global rank of five for publications in chemistry[3]. Worth mentioning are the domains like physics, engineering, psychology and social sciences, that have gained considerable increase in citation impacts[3]. Investigations reveal that male and female researchers from India have almost equal contributions in research publications based on *Scopus* data[4].

A study on India's scientific publications by the Department of Science and Technology, New Delhi, reveals that the analysis of changing trends in outputs of science publications from India as estimated through 5-year moving averages indicates 66% growth rate between 2006 and 2010 relative to the 2001–2005 period[3,5]. The Elsevier[2] survey reveals that the research publications from India have increased from 54,000 in 2008 to 93,000 in 2012 at an annual growth rate of 14.4%. According to Michiel Kolman (Elsevier) articles from India having foreign collaboration show significantly higher quality[2]. The reason may be multidisciplinary collaborative research work and advanced technical input in research available from well-equipped foreign laboratories. On the other hand, research collaborations with Indian as well as foreign biotechnological companies have also been observed to contribute positively to the enhancing research publication output of India. Besides the encouraging fund support from the government, huge investment by the private sector in scientific experimental processes and reagent procurement as well as adaptation of expensive yet necessary technologies and instrumentation in research work have contributed to the increasing research innovations and hence scientific publications from India. The qualitative and quantitative output of articles from India is higher than countries like China, Brazil and the UK. According to Kolman, the citation of Indian research in patents is low compared to other countries. Also, the number of patents granted to India in 2012 is 3588, which is higher than that of Brazil (1027)[2]. In the span of the last four years, most of the top cited papers are from India. Field-weighted citation impact (FWCI) is considered to be positively proportional to the quality of publication. Unfortunately, FWCI for India is reported to be decreasing. India's international co-authorship publication is more than that of China. Reports mention that Indian publications with foreign collaborations are more in number compared to research publications from Indian laboratories alone[3].

Increase in the use of internet has been revealed to bear a direct correlation with the increasing number of scientific publications from India. The logic can be attributed to be the ease of access to the global scientific databases and journals that has added to the increasing contributions of Indians in science and research publications[6].

According to Mike Boswood (Thomson Reuters) current rise in output of scientific publications from India is comparable to the country's rise in economics and that India has potential to be the 'home' for 'world class research' and 'one of the leaders in world science'[6,7].

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