

Problems of school science education in India

Subramaniam¹ has brought into focus the symbiotic relationship between school education and the university system. He deplores the minor role played by Indian universities in the promotion of science education: 'experience from around the world indicates that the quality of education depends critically on having well prepared and motivated teachers. The role of the universities in school education is generally thought to be the preparation of school teachers. However, universities and research institutions in India have typically played a minor role in teacher preparation, which has taken place largely outside the university.'

The Justice Verma commission report concludes: 'the isolation of teacher education from mainstream university education has indeed taken deep root and is endemic to the entire education sector.'² The Committee also observed that bulk of trained teachers who undertook TET (teacher eligibility test) failed to qualify despite having a professional degree in teaching. This reflects two aspects: the poor quality of both teacher education programme and general education being provided in Indian institutions.

During 1975, I undertook a survey of Punjab schools to determine the reasons for high rate of failure in the science

stream³. One of the reasons was the poor quality of science teachers who were not qualified to teach science at high-school level. There were very few teacher training colleges in Punjab and the stress was on pedagogy rather than the subject content in teacher training. This situation has changed and teacher education has expanded massively over the last few decades, most of this expansion (almost 90%) being in the private sector without any regulatory body to control and maintain the quality of training.

In Germany, my research collaborator, Rajinder Singh, who is a high-school teacher himself with a PhD degree in the history of science informed me that most of the science teachers are trained in universities. There are no private colleges as in India. Teacher training programmes have both pedagogy and subject content, followed by a rigorous training of two years in school-level teaching and stringent examination system of evaluation. Some of the school teachers hold doctorate degrees in science or science education.

I agree with the observations of Subramaniam¹: 'The separation of teacher education from the university has served to widen the separation of pedagogy from subject matter.' As a consequence, our teacher training programmes

suffer from the malady of poor quality of teacher orientation in science subjects.

Subramaniam¹ has also pointed out discrepancies and suggested some remedial measures: 'The rapid growth of a separate professional stream of education in isolation from the university, is prone to commercialization with its attendant loss of quality and integrity. Second, organic links with university-based knowledge disciplines are vital to introducing innovation in teacher education, as in other professional streams. There is a third important reason why isolation from universities is particularly debilitating for teacher education.'

1. Subramaniam, K., *Curr. Sci.*, 2016, **111**(10), 1575–1576.
2. Verma, J. S., Report of the High-Powered Commission on Teacher Education constituted by the Hon'able Supreme Court of India, MHRD, GoI, 2012, vol. 1, pp. 1–98.
3. Virk, H. S., *School Science*, National Council of Educational Research and Training, New Delhi, 1976, 1–5.

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Shanti Swarup Bhatnagar prize: an inspiration for international recognitions – III

Our earlier studies^{1,2} showed that Shanti Swarup Bhatnagar (SSB) prize winners have been recognized as Fellows of the Royal Society (FRS), Foreign Associates of the US National Academy of Sciences (NAS) and Fellows of the World Academy of Sciences (TWAS) for their outstanding scientific achievements^{1,2}. Here we look at the SSB prize recipients awarded with TWAS prize which is ranked among the highest scientific accolades bestowed on outstanding scientists in developing countries. These are awarded annually in agricultural sciences, biology, chemistry, earth sciences,

Table 1. Geographical distribution of recipients of the World Academy of Sciences (TWAS) prize (1985–2016)

Awardees	No. of countries	Name of countries
24	18	Bangladesh, Costa Rica, Ethiopia, Ghana, Iran, Jordan, Korea, Malaysia, the Philippines, Sultanate of Oman, Uruguay, Venezuela, Colombia, Egypt, Lebanon, Nigeria, Turkey, Uzbekistan
27	4	South Africa, Pakistan, Chile, Taiwan
37	2	Mexico, Argentina
38	1	Brazil
50	1	China
62	1	India
238	27	