

Have we forgotten science teaching in schools?

In continuation with the chain of letters expressing concern about the falling standard of science education in the country (see Singh, C. P., *Curr. Sci.*, 2002, **83**, 7), I would like to focus on an aspect not touched upon by others – science teaching at the school level. The dictum ‘catch them young’ holds good for breeding good scientists for tomorrow also. However, we have grossly overlooked the issue to the point of dismissal on the premise of it being regarded as of no consequence.

While a few exceptional aristocratic schools may have an environment to learn and practice science, the vast majority of them are in bad shape. Science education in schools suffers on several counts. Improper curriculum planning, poor quality of prescribed government textbooks, lack of motivated teachers and lack of depth of knowledge in them, reluctance to try innovative and imaginative approaches to teaching, non-existent refresher courses or promotional schemes for talented science teachers, non-recognition of post-graduates as qualified teachers are some factors. It begins with poor planning of science curriculum that aims at ‘teach everything’ and leaves nothing for ‘learn something’. The number of teaching hours available for each chapter is not taken into account while deciding on the chapter content. Another important lacuna is total omission of ‘methods of science’ as part of the science curriculum. While many public schools adopt books published by more competent private publishing houses, government-recognized and aided schools follow the mandatory government-published textbooks. These books often contain factual errors, printer’s devils, poor language, improper illustrations, and monotonous and clumsy layouts. While textbook writing ‘contract’ is awarded on the basis of extraneous considerations, even the book cover is not spared from government propaganda. Very often the authors and editorial committee

members are not the experienced school teachers, but the figurehead university professors and freelance college teachers. At the end of each chapter, though there are some obligatory ‘do-it-yourself or learn-by-doing’ items, these are not prepared diligently. Science projects are always extracurricular activities and never a part of the curriculum. All this is done to help poor children with low-priced textbooks. Instead, the government could subsidize good science books to poor children directly. This will encourage better books and set in healthy competition.

The science teacher is obviously the most important link between scientific information and students. It is hardly recognized that science teaching needs special skills, imagination and a thorough understanding of the subject. Teachers have to cover the vast portion, set-up questions, conduct periodical exams and evaluate answer sheets. Hence they have no time to prepare their own teaching aids, laboratory demonstrations or even a field visit to observe science in nature. It is paradoxical that many schools have stocks of laboratory equipments, charts and other teaching aids, but these are seldom used during regular teaching hours. Many schools now have computers, but do not encourage teachers to use them for teaching science. However, what is basically lacking in science teaching is kindling scientific curiosity in the young minds, keenness of observation, sorting out facts, asking the right questions and trying to find the right answers through methods of science. A simple question ‘Are boys taller than girls?’ can be put forth and demonstrated as a scientific project that requires nothing more than a metre scale! A talented teacher can take the students through the process of putting forward a hypothesis, developing sampling and data collection methods, analysing the data and testing statistical significance to accept or reject the hypothesis. However, this needs motivating

science teachers through refresher courses, and schemes to recognize and reward the talented science teachers. It is unfortunate that education departments do not recognize Master’s degree in science as equivalent to B Ed. A person with a Master’s degree has better exposure to laboratory atmosphere and greater insight than one with a B Ed degree. Universities and well-equipped colleges can organize refresher courses exclusively for school teachers to update their knowledge and skills in science teaching. It is heartening to note the developing popularity of science fairs across towns and districts. We also need to improve and monitor the quality of these fairs, preferably by teams of practising scientists, and prevent them from becoming routine rituals with only styro-foam-cut models. A best science teacher award should also go along with the best model in such fairs. Another good development is organizing the children’s science congress, which now holds its annual meeting along with that of the Indian Science Congress.

Finally, our research institutes need to acknowledge their role in this investment in future and commitment to the society. It is not a waste or misappropriation of resources if these institutes can set aside a small fraction of their time and resources for the cause of science teaching in schools in their neighbourhood. These institutes can encourage and participate in school science projects, and their scientific faculty can reach out to younger minds with popular lectures, without expecting any remuneration. Nothing is more motivating for the children than meeting scientists at their workplace.

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