

SOME THOUGHTS ON TECHNICAL EDUCATION

• By Dr. M.N. Buch

Before the Indian Institutes of Technology were set up almost all our technical education were imparted by government engineering colleges. Some of the famous ones were the Government Engineering College, Guindy, Government Engineering College, Jabalpur, Victoria Jubilee Technical Institute, Bombay, College of Engineering, Pune, the Benares Hindu University Institute of Technology and, most important of all, the Thompson Engineering College, Roorkee. This last named college was the alma mater of almost every irrigation engineering in India. By and large these colleges imparted education upto the B.E./B.Tech level and the subjects most favoured were Civil Engineering, Mechanical Engineering and Electrical Engineering. BHU was distinguished by the fact that it had an excellent course in Chemical Engineering. These colleges and others which followed in the private sector such as the GSITS, Indore, maintained a high standard of technical education, not specifically research oriented but definitely aimed at producing practical engineers who could manage projects in the field. Over time we have allowed most of these engineering colleges to go into decline, partly because they are inadequately funded by government, partly because their infrastructure has been allowed to become obsolete and partly because with stagnant pay scales for teachers these colleges have had a real problem of attracting quality faculty.

Into the system we injected Indian Institutes of Technology, with Khadagpur being the first so created. The IITs at Kanpur, Bombay, Delhi and Madras followed and till very recently these institutions remained constant at five in number. It is only Arjun Singh, Minister for Human Resource Development who suddenly took a decision to bring about an exponential growth in the number of IITs, despite the fact that we already had large number of Regional Engineering Colleges, which were posed midway between the normal run of engineering colleges and the IITs. Even these have been upgraded to National Institutes of Technology whose infrastructure is now being built almost to IIT standards. In the last ten years we have also introduced four Indian Institutes of Information Technology which are focused on IT and ICT, but are of the same level as an IIT. A similar expansion has taken place in the number of Indian Institutes of Management,

What is the result of creation of so many new institutes of higher learning which are, at least in principle, supposed to be research oriented and at the cutting edge of technology in terms of innovation, invention and discovery? These institutions can only take in faculty at Ph. D. level of qualifications. We need eight thousand Ph. Ds per year in technology and we are producing something like eight hundred. Not all of them come to teaching. The end result is that there is enormous shortage of faculty, with even the older IITs functioning at less than seventy percent of the sanctioned strength and the newer ones having a shortage of more than half. This is true of the IIITM, Gwalior also. I know that there is a project for creating a virtual university with the collaboration of IIT, Kanpur and IIITM, Gwalior, but the virtual can never substitute for the real and certainly not for the teachers on the ground with whom the students can interact in person. Our education establishment has neither nurtured a faculty development programme, nor even made a long term assessment of our faculty requirement, not only for the higher level institutes of technology and management, but also for the Central Universities and the State Universities. In other words, whereas the Ministry of Human Resource Development have been very willing to expand in terms of numbers of institutions, it has never taken a holistic view of the requirements of education so that the balance between infrastructure, teachers and the taught remains in

equilibrium. All the decisions being ad hoc, we shall end up with a dilution of the quality of the top institutions and the general lowering of standards as more and more of these institutions are set up without adequate planning, faculty, etc.

We need to ask ourselves a very pointed question about the real role of the Indian Institutes of Technology. They were designed to impart quality education in the field of technology, to conduct independent and sponsored research and to be the leaders in technology development. Instead these institutions have begun to measure their success by their placement record, including the pay package that a graduate would enjoy. Therefore, the education imparted itself has tended to prepare a product which is employable rather than a scholar who has a desire to be educated, and use his education for research and translate the research into action. Even within the existing institutions there is a dilution of academic standards, academic motivation and even pedagogy and mindless expansion can only make the situation worse.

What is the way out? Government must immediately identify about a hundred of the older engineering colleges which were once excellent but which are now declining. If about one hundred crores rupees are pumped into each of them so that their infrastructure is modernised and improved and the teaching standards are raised, then the major part quality undergraduate education would stand transferred to these colleges, the products of which would be recognisable as engineers and technologists. Much of the job market would be satisfied by these colleges because on graduation the students could be employed. Some of the more academically inclined students would then pursue a course of higher studies in a NIT, IIIT or IIT, the numbers of which should not now be increased. These institutions would then be able to concentrate more on research and its application and, therefore, it is technological advancement which would be their objective rather than the pay package of their students. It is then that these institutions would become the thinktanks for both government and the private sector and they could adopt forward-looking policies which keep pushing back the frontiers of science and technology. This would make India strong.
