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The way forward...Workforce of the future

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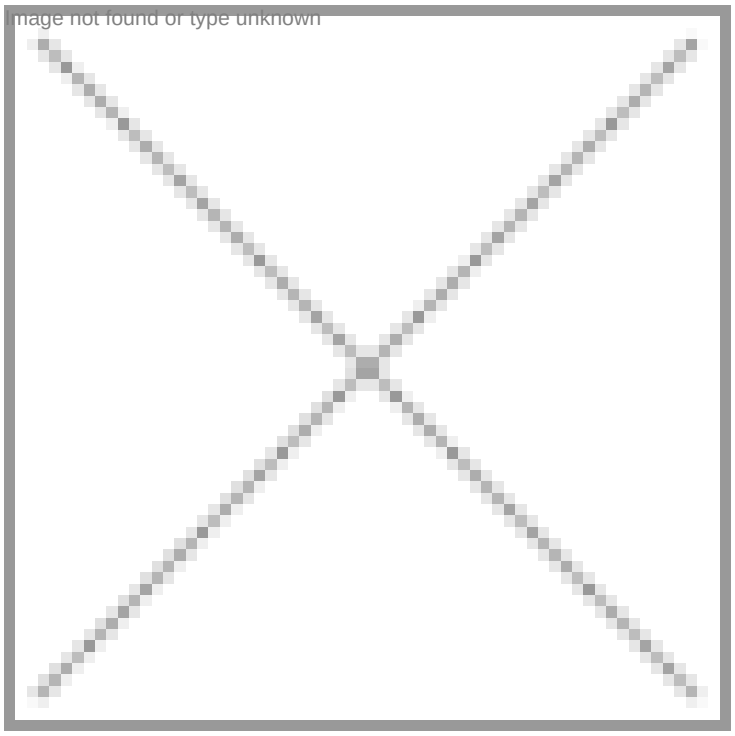

The way forward...Workforce of the future

Creating capable and well-trained workforce to support India's growing biotechnology industry. Some solutions.

The prospect of the country losing its competitive edge in biotechnology and the subsequent skills of future workforce has become a matter of significant concern.

This is not to say that biotech education is non-existent or is poor in India because there are many examples of institutes running excellent biotech courses and creating a pool of scientists and managers every year. These schools provide students with tools essential for maintaining a competitive edge in the biotechnology industry and pride themselves on their access to comprehensive training and theoretical programs thus aligning themselves to the needs of biotechnology and pharmaceutical industries. However, these programs should not only be replicated across the country, but institutes and the government should also come forward to commit resources for the execution of these programs.

School of Biotechnology at Jawaharlal Nehru University (JNU) in New Delhi, is an excellent example wherein students are given a strong theoretical foothold in biotech along with an excellent exposure to practical applications. This is clear from the fact that, the biotech department at JNU has spent more than Rs 1.05 crore on lab equipments in the last three years. With an investment of Rs 2.9 crore, the country's premier institute is also setting up a BSL3 facility. The institute has developed and transferred more than seven products to the industry in the last two years with active participation of the students. Along with the upcoming BSL 3 facility, the School of Biotechnology has 14 labs for the benefit of the students.

Almost all the students pursuing post graduate degree in biotechnology at JNU prefer to choose higher studies over an immediate placement. "Many companies approach the school for campus recruitment. However, our students opt not to go for industry jobs immediately after MSc rather they decide to pursue higher studies and PhD in India or abroad. This is because they are well aware of the fact that they will face stagnation in their career with only an MSc degree," Dr Rakesh Bhatnagar, acting dean, School of Biotechnology, JNU says.

Maintaining that biotechnology is an application-based discipline, "many students having gained post-doctoral training abroad

have established their own biotech companies, or are working as CEOs, presidents, vice-presidents in well known biotech companies," he adds. Panacea Biotec, Hindustan Lever, Premas Biotech, Ranbaxy are some of the companies where JNU graduates are either working or are heading the companies. Many of its graduates are also working as faculty members in institutes or universities in India and abroad.

Bangalore-based Institute of Bioinformatics and Applied Biotechnology (IBAB) is yet another example. The institute has been an abode to several new scientists and entrepreneurs. To enhance its training and research capabilities, the institute recently upgraded its bioinformatics and biotechnology laboratories with the state-of-the-art facilities. A large number of international scientists who visit IBAB all year round impart a wide range of knowledge to the students on the recent advances in the biotech industry and academic research. This exercise in turn helps the students to get in touch with the current research, focus on self-learning capacities and personality development. Modern facilities have helped IBAB to be among the very few Indian institutes which have achieved 100 percent placement record in the life sciences sector. IBAB receives continuing strong support from the Government of Karnataka. In addition, it has received grant support from DST, DBT and MIT.

The institute has also been maintaining very close association with the industry and companies like Biocon, AstraZenecaand Merck endowing faculty chairs. Companies like Millipore India and Sartorius have been providing scholarships to IBAB students.

A smaller group of private institutions too have been playing an exemplary role in creating biotech talent pool. These institutes have invested significantly towards building good infrastructure, and have started specialized programs in the field of biotech.

The biotechnology program at SRM University in Tamil Nadu, works with the local bioscience industry to train students in basic laboratory skills, genetic engineering, protein purification techniques, cell culture, immunology, agribiotech and bioinformatics. The curriculum is kept upto date with an annual meeting with the industry. Besides regular visitation to the industry sites, the institute also runs academic programs planned and executed for industrial requirement. Further, in association with the instrument supplier companies like GE, Spinco Biotech, Chemito, BioRad, and ABI, the institute also facilitates specially structured instrumentation training to its students.

Dean of School of Biotechnology, SRM University, Dr K Ramasamy states, "We have concentrated towards the empowerment of our graduates with globally competitive skill and employability. In this regard, we are supported by an international advisory board-biotechnology which is represented by prof C R Lowe, Institute of Biotechnology, Cambridge UK." The institute also has a corporate advisory board for biotechnology represented by industry leaders like Dr Rao, vice-president, Orchid Pharma India, Dr K K Narayanan – ABIF India, Dr S Sithanantham, director, Sun Agro, vice-president, Cognizant Technology Services-Life Science to name a few. To give their students a global perspective, the institute has given special attention to exposing its students to the global industry and academic community. And working towards it, the institute has started the semester-abroad program with leading institutes like MIT, UC-Davis, Berkeley, University of Wisconsin, UGA, Warwick-UK, TU Netherlands, NUS Singapore, UNISA,UWA Australia and also a dual degree program with Warwick UK, UW Australia and University of Lund, Sweden.

The School of Chemical & Biotechnology at Sastra University, Thanjavur is another example where the institute is putting in every effort towards creating efficient bioscience workforce. The school of biotechnology offers specialized and denominated postgraduate programs such as bioinformatics, chemical engineering, industrial biotechnology and medical nanotechnology, besides PhD programs. With emphasis on experimental learning, the institute offers innovative academic programs and continuously upgrades its curricula. The school is equipped with state-of-the-art laboratories that provide adequate hands-on-training to the students in techniques of biotechnology, experienced faculty and a curriculum tailored to suit industrial needs. Equipment worth over Rs 4 crore have been housed in the life sciences block.

The programs offered by this biotech school are focused towards preparing students for leadership in the development and commercialization of advanced technologies. It strives to keep its students abreast of the progress in the frontier areas of biotechnology. Many of its students and faculty members have received fellowships from the Indian Academy of Sciences, DBT, Tata Institute for Fundamental Research and National University of Singapore.

These are the few institutes who have responded to workforce needs by creating innovative programs to prepare future workers for the Indian bioscience industry. The 400-odd biotech institutes in the country have realized the need to interact more with the industry around them to finetune the specifics of skill-training.

However, the number of institutes offering biotech education of this standard are very few compared to the number of people actually required by the industry. Therefore, such efforts need to increase and more importantly, they need to be promoted by the government. Although there are many post graduate courses in biotechnology being run by several colleges and universities across India, but they do not focus on hands-on-training of students in laboratory biotechniques to the required extent. Talking about the of lack of good infrastructure, insufficient manpower for training, lack of knowledge among the faculty or an improper curriculum, Dr Shrikumar Suryanarayanan, director general, ABLE says, "The significance of in-house research activities is not realised in many institutions. As a result, while there are several hundreds of biotechnology degree-holders emerging every year in India, there seems to be an unfulfilled requirement of reliable technical expertise, in the area of biotechnology." He suggests that the courses that aim at filling this gap in the human resources have to be redesigned. There is an urgent need for world class institutions. The institutes should strengthen basic sciences like immunology, cell biology, recombinant technology and government can play a critical role in this space.

Most of the companies have to invest significant amount of money and time in preparing them for the industry. ThomasPutti,

president, National HR Life Science Forum and Head, HR with Advinus Therapeutics shares, “We have to get students to unlearn and re-learn many practices, once they step into the organization. Intense training to make them job-ready is imparted, depending on the function, they join. These are structured classroom and on the job training interventions, whose course content is designed and delivered in-house. There is a huge investment in training both in terms of time, money and efforts by most organizations today in India.”

Given that there is an increasing and critical need nationally in both academia and industry for people trained in the field of biotechnology, the reasons for offering denominated degree in biotechnology are clear. The gap between the needs of the industry and the aspirations of academic community is also very large. There is a strong mismatch in perceptions of the two on the issues related to technology development. While academicians involved in education are clear about the basic research requirements, the industrial needs are not always well understood and met. So the pertinent question that remains is: what does this industry want from biotech colleges and universities?

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