

THE CHALLENGE OF GLOBALIZATION FOR INDIAN UNIVERSITIES

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Indian Universities by world standards are far too behind their counterparts in developed countries. They operate still on old lines as if they are an extension of high school system. whereas, Universities in developed countries like U.S.A., Germany, U.K. are primarily research Universities. Research output, especially need based, is their main contribution and education, is their by-product. Bush commission report "Science, The Endless Frontier" (1945) gave this philosophy to Universities of U.S.A. which is also adopted in other countries. National Science Foundation of U.S. has reprinted this report in 1990, and re-circulated.

The report prescribed that Universities main output should be research, patents, new technologies, intellectual property rights. Higher education should be their by product. Students learn best by researching, and then it is relevant and up to date. It is because of this philosophy that the

education in Universities of U.S. is observed to be innovative and creative in nature. Without research, it is believed that the education remains stale and outdated. Normally, two third budget of a University goes to research.

CHARACTERISTICS OF UNIVERSITIES ABROAD :

On the campuses of Universities like Madison, Cambridge, Edinborough, what we notice is that research companies are flocking round them. Incubators, research parks, innovation centres, patent and intellectual property rights bureaus are distinctly visible. Venture capital foundations and VCF companies have opened offices in campuses in search of new technological ideas for commercialisation. Universities in developed countries have become like magnets which attract not only scholars but also industry, entrepreneurs and VCF companies from across the world. They are globalising their operations to meet the world needs both of education and

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of technology. Students from many countries, so also industries from across the world are coming to their campuses and they feel proud of the same. By virtue of strong research base they are a source of latest knowledge in education and a source of new ideas, enabling companies to win. It is well realised in those countries that new knowledge that is to say new technology is an important source to bring about economic change. According to the nobel laurete Bob Solow, USA has doubled its industrial output from 1909 to 1949 and that 80% of the credit is attributable to technology change.

Universities like Madison are producing patents as many as 1000 per year. The university sells patents to companies and earns an income as much as 40% of its budget. They generate wealth through research, which is believed to be the main stay of high income economies in the world.

They spend about 4% of GNP on research. Low income economies like India spend very less-less than 1% of GNP on research - so observed World Development Report (WDR) 99. The employment generation and income generation is attributed mainly to research in universities.

Young scholars along with in service personnel carry out research, which is disseminated best through teaching in classes. Innovation and research are considered as "well springs" of economies.

HELPING BUSINESS TO WIN :

Every University has a patent and technology licensing department engaged in technology sale. The author during the period of his recent three months visit to Germany, U.K. and U.S.A., sponsored by U.G.C. Govt. of India, has studied in depth organization and management practices of Universities along with their missions systems and procedures. Universities in general have huge campuses, with student strength in the range of 20 to 80 thousands and faculty strength from 1000 to 10,000. For example, MIT Boston has around 30,000 students and 3,000 professors, Karlsruhe University has around 25,000 students and 1,000 professors. All teachers have Ph.D. qualification. Faculty represents a wealth of talent and knowledge which is utilized to benefit both faculty and University financially. Whereas in India faculty with Ph.D. qualification are very few. Our students are thus being taught by less qualified and less experienced teachers.

Spin off of companies from universities is a common phenomenon, so also spinn off of technologies. The companies like Apple Computers, Hewlett Packard (HP) were conceived and born in universities. Project ideas were based on their Ph.D. thesis. A foundation is set up in MIT Boston with the facility of venture capital fund enabling professors and Ph.D. scholars to start new ventures based on technologies, they develop during the period of their research. Every year as many as 15-20 New Technology Based

Firms (NTBF) are born in MIT Boston. The University gives consultancy on retainer basis to as many as 3,000 companies. This is not unique with MIT only. It is true with almost all universities in developed countries. They have created Technology Incubators to enable raw project ideas to be innovated to marketable stages. The entrepreneurs and professors are thrilled when they see their theoretical ideas being converted into practical projects. There-by they are earning wealth for themselves so also for the University besides credit and satisfaction. Universities thus have become "Maternity Homes" for safe birth of New Enterprises. Such enterprises which are based on brand new technologies help to reduce mortality rate and sickness of other industries.

NEW MODEL FOR UNIVERSITIES ?

Does Indian economy need such Universities ? can we do without them ? at what cost ? Without such schemes, our investments are being made in sunset technologies. Obviously they can not be competitive globally. National Council of Applied Economic Research, New Delhi has published the results of a survey which found that of the 657 Indian companies in the study sample that started up in 1997, 57% were manually operated and 38.7% were semi-automated. In the same period, according to the study, 80% of the start up companies in Japan were fully automated and 20% were semiautomated. It seems then that substantial investment in India is being

made in companies which are based on outdated technologies, and which are therefore handicapped from the start. Such companies cannot hope to be competitive on global scale. In U.S.A., 26% of capital investment is in New Technology based firms (NTBFS) whereas in India NTBFs are almost non existent.

However, the shift from old technology to new technology industrial base is not easy to achieve. It presents many technological, social, economical problems, as well as resistance from trade unions. People must unlearn old methods and skills and adopt to new technologies and knowledge. Universities must reorient themselves, prepare to offer courses and to interest people in learning and becoming more competent. Without this strategy by Universities, our industries and industrial estates will languish and become sick, which would be looking for help from foreign collaborators. Can Indian Universities dream of propelling the industrial growth ? They must do so forthwith. Otherwise, Universities may become further more dysfunctional and economy will run into difficulty. The rate of absorption of new technology in various walks of life depends very much on knowledge of people and their scientific and technological capabilities.

NEW VISION FOR NEW WORLD :

What Indian Universities lack today, is the new vision of new world. They ought to develop connections with best known Universities in the world and correct their priorities and strategies. It

is no doubt a long way. Yet, it must begin somewhere. Is it not that thousand miles journey begins with a single step?

What Prof. Terman of Stanford University in U.S.A. observed in 1950 that industry so as to remain competitive globally needs access to first class research in Universities. So also the first class researchers in Universities need access to industry so as to commercialise their research findings. This is very much applicable to Indian universities at this juncture of time. They cannot become and remain competitive without the support of each other. Will our universities care to follow today what they did years before?

It is important to know how universities are conceived and started in those countries. The author visited a newly started Harburg University in Germany. This university started twenty years before under collaboration from 15 best universities in U.S.A., U.K., Japan and Germany. Today this University has 10,000 students and 1000 professors. It started with a research park which to day contains around 500 research based companies adding strength to the economy of the region. University is not planned in Germany without an industrial estate and industrial estate is not planned without a University.

The author has visited Harriot Watt University at Edinburgh, which is located on 600 acres of land and has a research park on 6000 acres surrounding the University. The University of Madison U.S.A. has a strong Alumni

Association known as Wisconsin Alumni Research Foundation which is managing and maintaining a big research park.

Taiwan has set up a "Science Town" at "Hsinchu" with some 13000 researchers in two universities, six national laboratories, as well as around 150 companies, specialising in electronics. Tsukuba Science city near Tokyo is another example of university technology park collaboration.

On the other hand, Indian universities are engaged more in teaching as if they are schools. The vector direction of our universities is wrong. They are largely teaching and examining bodies without research base, and hence they are not effective to cope with challenges. Will they learn themselves and adopt what best universities in the world are doing? Will they do correct Bench Marking?

Universities abroad have opened continuing education departments, more from 1980, for in-service personnel. They are offering short term refresher courses leading to Ph.D. The research work done by people in their work places is counted for the award of degree. They have a flexible model, CAFETARIA approach in which students can choose a wide variety of options. A combination of economics, engineering and music is also possible.

The credit transfer system, from one University to another is common. A student can study for the same degree course in a number of universities. The

credits earned in one university are approved in another. European commission encourages the mobility of students and professors. It has drawn a programme known as Leonardo-da-vinci to provide financial support to promote such mobility. The students are allowed to get degree from anyone university which they have visited.

LIFE LONG EDUCATION :

Continuing education has become so common that the inservice part time students studying in University are ten times larger than the full time students. We see three generation students in campus. Learn while you earn, life long is very common. It is observed in a OECD study that Europe, Japan and U.S.A. together represented 80% industrial global output. The main contributing factor to this dominance include continuing education policies and practices of Universities in developed countries. Continuing education facilitates better management of technology and adds significantly to economic success.

Indian universities, yet do not have continuing education departments, patent and technology licensing department. Technology park and Incubators are conspicuously absent. They have almost no connection with industry and industries have almost no confidence in universities. The industrial progress in India is propelled thus far by foreign collaborators. Indian universities have not gone nearer to them, nor industries have established links with universities. Universities have

become corporate offices bureaucratic and political in nature. Consequently what is taught in universities is not wanted and what is wanted is not taught. There is a serious mismatch between demand and supply. Rather than motivating and preparing students for the world of work, the Universities have become organizations which tend to thwart and impede the potential of their students. The national educational policy of 1986 recommended autonomy to colleges to enable them to respond to the needs of industry in terms of research, training, and technology transfer. However progress has been slow.

The traditional affiliating system of universities has become a problem rather than solution. It has stifled the innovation potential of academics and the public is unhappy. Attempts at improvement are being made. The lack of mobility of Indian academic staff and research staff to world class centres is seen as a major problem. Why is India unable to upgrade its universities ? Do we realise that the cost of mediocrity is higher than its cost of upgrading? Why do Indian institutes not transfer technology to industry through the use of patents and IPRS ?

To conclude, globalization of Indian universities is the pressing need of time. Redefining their scope, missions and visions in the light of world wide changes, ought to be carried out forthwith. **Restructuring the organizations, methods, systems and procedures, revising the university acts, making**

colleges autonomous should become the first item on agenda. Research in universities is the most cost efficient and effective model for employment and income generation. It should, therefore, become the focus of university activities.

Universities to a nation are like heart to our body. Outdated universities are more costly than the cost of their modernisation. They should, therefore, be revamped urgently. There are no doubt many problems in adoption and implementation of new policies and practices. How to manage the change is certainly a big challenge before Indian Universities. IIT experience along with experience from abroad need to be taken into account. The speed and direction of change in Universities in coming years matters most, to the well being of the people. It is hoped that with the given will and skill of leaders in academics, leaders in industry and politics, we will be able to achieve the desired goal.

EXPERIENCE OF IIT's :

The Indian Institutes of Technology, which were set up around 1960, differ from the universities. They are autonomous. They are single institutions, with one campus and a strong research base. They are held in high repute and attract the best students in the country. (The IITs were initially set up in collaboration with the UK, the USA, Germany and the USSR, among other countries.)

The IITs are successful in providing high-quality education and generating

new technologies for industry. But there are only six of them - too few for a country the size of India. After graduation, many students from the IITs leave for the UK or the USA, a cause of national concern. The infrastructure needed to retain such graduates is lacking. Lately, however, the IITs have realized the importance of such facilities as technology parks and innovation centres and have been introducing them as a matter of urgency. For example, IIT Delhi has set up a foundation for innovation and technology transfer, and IIT Kharagpur has established a science and technology park for entrepreneurs.

However, although the IITs have begun to pay more attention to the transfer of technology to industry, much remains to be done to if the aspirations of both students and the business sector are to be fulfilled. There is a need to develop far greater interaction between the IITs and the universities and colleges. In this way, the activities of the IITs can inform the establishment in other HEIs of effective mechanisms for technology transfer and the education system can be more closely linked to the needs of industry. The indigenous expertise which is available within the IITs needs to be used more widely. My own college has followed this path, and the experience has been good : we regularly get professors from IITs to teach students and to advise staff in the management of R&D projects.

