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Higher Education in India: Seizing the Opportunity

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WORKING PAPER NO. 179

HIGHER EDUCATION IN INDIA: SEIZING THE OPPORTUNITY

Sanat Kaul

MAY 2006



INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS

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Foreword

India's growth in recent years has been led by the services sector. The most noticeable aspect has been the recent big boom in the BPO/KPO sector. This off-shoring trend is certain to continue and India faces the challenge of generating an appropriate supply response to retain its existing advantage. It should be noted that Indian's spend nearly \$4 billion annually to send their children abroad for higher studies and technical training while there is no reason for India not emerging as a global hub for higher education and technical training. The real challenge therefore, is to expand capacities in higher education to keep ahead of the curve of rising domestic and global demand.

However, this poses a well known policy dilemma. India has a huge population of uneducated children and the Constitution provides for free and compulsory education up to the age of 14. The country also has the dubious distinction of one of the highest levels of illiteracy in the world. The system of public education at all levels is in advanced stage of disrepair and disarray. Clearly, governments both at the Center and in the States need to allocate far more resources and attention on ensuring that future generations are equipped sufficiently to operate in a knowledge economy. Thus, India has to find a strategy that will enable it to effectively address the multiple challenges in the education sector of improving literacy, universalizing access to quality basic and secondary education and at the same time ensuring an adequate supply of higher skills and technically trained manpower.

In the above context, this paper by Sanat Kaul reviews the prevailing policy environment to evaluate its efficacy in ensuring that India is successfully able to address these challenges in the education sector. Given the well established constraints on public funding of education, the role of the private sector specially in the provision of higher education and technical training has been highlighted. The paper suggests that India needs to have a proactive demand based policy towards private higher education including foreign institutions/universities desirous of setting up campus in India or entering into joint-ventures. This has to be combined with the establishment of a regulatory mechanism that ensures that students' welfare is not compromised and quality standards are maintained.

Policy measures required for generating the needed supply response will supplement efforts of Indian negotiators for securing a better market access for our services exports in the on-going Doha Round negotiations. We are very grateful to the Sir Ratan Tata Trust for funding this and other research on WTO issues.

Rajiv Kumar
Director & Chief Executive
ICRIER

May 2006

Acknowledgement

This small paper is a result of a fortuitous discussion with Dr. Arvind Virmani, Director & Chief Executive, ICRIER on the issue that India was missing out once again on the knowledge sector boom. I had happened to mention that the present BPO/KPO boom in India will be rendered a mere accident, unless we are able to provide sufficient skilled manpower to keep up the advantage. The Government must step in to facilitate the enabling environment for higher production of skilled manpower in India, else we shall swiftly lose out to other countries.

I am grateful to Dr. Virmani for asking me to write a paper on the subject.

Sanat Kaul

Section I

Introduction

India is well known for its large pool of technical manpower, a fair proportion of which finds employment in developed countries, especially in the West. As a happy sequel to the story, India has recently witnessed a big boom in the BPO/KPO sector. In order to sustain this trend, and to ensure that India does not throw away this key advantage, it is imperative that we continue to produce a critical mass of highly skilled manpower at an accelerated pace. An enabling academic and economic setting is a key factor determining the fate of our nation in the wake of the knowledge sector boom. This paper reviews the prevailing policy environment in this context to evaluate its efficacy in ensuring that India remains ahead of the curve in the knowledge sector which has been growing exponentially in recent years.

In Section II that follows, we start with the Internet and its role in higher education, and then indicate the perception of the academic community on e-education and globalisation. In this context it may be mentioned that internet in education has a much wider role in extending education to a globalised world. This is followed by outlining the recent trends in the knowledge sector, indicating the advantage enjoyed by India in the area. Concrete measures required to mainstream India into the knowledge sector boom are suggested.

We provide a brief description of some of the salient features of India's education system, especially in the context of higher education. As one is seeking to provide quality education, the process of accreditation as it exists in the country is assessed. Some indications of the level of public spending on higher education are also provided. A case is also made to highlight the need for promoting a knowledge-based economy.

Section III is devoted to supply and demand factors in higher education provisioning. Issues with regard to both regulation and affordability are taken up in this section since they are recognized as important constraints in this context. We briefly review the role of

the private sector (including the entry of foreign universities) in the imparting of higher education in the country.

International experiences in managing the money that is engaged in funding higher education have been studied to derive lessons for India as a major constraint to private sector provisioning of higher education is the availability of adequate funds.

The concluding section explores the likely challenges ahead for India in deriving full advantage from the ongoing boom and the globalization of the knowledge sector. As public funding has its limits, the role of private sector as key to meet this challenge has been highlighted. The paper concludes with the issues likely to be encountered and offers a set of recommendations.

Section II

HIGHER EDUCATION: INTERNATIONAL SCENARIO

1. The New Economic Order and the Role of Higher Education

- 1.1 Two parallel developments in the world economy are worth noting, especially for their influence on provisioning of higher education: the growth of the Internet and consequently, e-education and second, the expanding role of World Trade Organization (WTO) in determining the trends in world economics.

2. Internet in Education

- 2.1 Never before was information so readily available at the press of a button, the Internet has changed the way the world behaves, does business, and thinks. Even school children search the web for study material to support their homework. Today, academicians do not need to spend much time on library research poring over bulky tomes and taking copious notes. They have the facility of faster and surer access to a much wider range of information through the Internet, not just to read but to print or save or forward to others as might suit their purpose. . Internet research has come to be recognized as an essential study tool in all higher education courses in developed countries.
- 2.2 The Internet has also played a major role in streamlining administrative procedures and processes of universities worldwide. Any modern university, management school or institute today has its own website on which courses offered are listed. Students apply for admission on-line which reduces paperwork and increases administrative efficiency. They receive e-notifications regarding admission, course schedules, and billing procedures, which they can pay on-line, as well as their results. Teachers prefer to receive tutorials on-line, which not only lends itself to faster transmission, but also avoids the difficulty in reading a manuscript. Similarly, some teachers not only put up their course material on the web-site, but also their lectures, which can be heard on-line such that students who were unable

to attend can also benefit from them. The faculty and students remain connected through email on which students receive instructions, send essays/assignments, fix appointments, etc. All students are expected to have their own laptop or notebook computer.

- 2.3 While a traditional Western university still has face-to-face lectures, it also offers on-line courses especially during the summer break. While such courses have the obvious disadvantage of the absence of personal interaction, they allow for discussion through setting up of chat rooms. Such on-line courses and discussions have often proved to be more rewarding than regular classroom interactions as they allow for students and teachers from different parts of the world to converge.
- 2.4 On-line Universities, which do not require physical infrastructure, have facilitated greater accessibility to education than ever before.. While popular perception values a degree from a regular college over one from an On-line college, the greatest advantage of an on-line university or college, that a student need not commute or live on campus tilts much of the debate in its favour.. This is especially true for certain kinds of courses designed to cater to the needs of students who do not have financial backup or family support. As acquiring specialized degrees is directly related to better jobs, re-engineering e-education at tertiary level has a great advantage. As jobs become more and more insecure and mid-life career changes more frequent, the need for on-line education is increasing overtime.

3. Globalisation and Higher Education

- 3.1 According to the results of a special survey '*Higher Education: Free degrees to fly*' (see *Economist*, February 26th-March 4th, 2005, pp63-65), higher education is already a global business. The days when higher education was a matter of national policy and government regulation are rapidly fading. Higher Education provisioning is now globalised and in many ways, a commercialized affair and the

way that the State had in the goings on is vastly diminished. According to Andreas Schleicher of OECD, a Paris based 'Think Tank' the numbers studying abroad were statistically negligible two decades ago. (Cited in the same survey in the Economist). According to the International Finance Corporation (IFC), the growth is now soaring: 2 million university students-approaching 2% of the world's total of around 100 million studying outside their home country in 2003 (cited in Higher Education in the same article in Economist). Since the late 1990s the higher education market is growing by 7 per cent a year. The Economist Survey on higher education further indicates that annual fee income alone is estimated at \$ 30 billion. While private profit seeking companies have entered the education business, even government-controlled universities are seeking independence from governmental authority. However, many countries including India, continue to control the fee structure of their universities causing financial stress to foreign students, who are generally made to pay much higher fees than local students. This has resulted in many universities openly soliciting entry of foreign students. To facilitate this process they have even tailored their courses to international requirements besides appointing agents abroad and publicizing the offers widely in the media.

- 3.2 Hence a University is no longer a place where students apply to study. Universities are now actively pursuing students, especially foreign ones using a wide variety of strategies to market their courses. The student is now the customer or client. With globalization, Universities are spreading their reach beyond geographical and political borders. The British, Australian and American Universities are setting up campuses in Singapore, China and the Gulf. Universities realise that they can examine many more students than they can teach. Hence many of them are collaborating with other institutions or franchisees to teach their courses under their brand name without getting involved in the direct business of imparting the education.
- 3.3 The example of Professional Training Colleges best illustrates this point. The growth of such colleges world wide shows rising desire for professional

qualifications, a new need for mid career education and finally, the increasing acceptance of professionally qualified candidature in the job market. In this connection, the example of the US CFA (Chartered Financial Analyst) is prominent. This professional degree awarded by the American Association of Financial Professionals has now become so popular that most students prepare for the qualifying examination with the help of private tuition companies. Very often the costs incurred in preparing for the examination outstrip the stipulated entrance fee of \$ 1455 for the examination itself. Now about 40 universities in the US are teaching the course as a part of their post graduation curriculum.

4. World Trade Organization (WTO) and Higher Education

- 4.1 Fundamental to understanding the future role of WTO in education is the question: is higher education a marketable commodity like an fmeg product or is it a service like water or electric supply? Is higher education a commercial service or a public good? .
- 4.2 While universities and the academic community in general would like higher education to be viewed as a public good, the prevailing argument in the WTO Secretariat is that higher education is akin to ‘private consumption’ directly benefiting the consumer by way of higher income. In April 2002, Universities from Latin American countries, Portugal and Spain adopted a Declaration at the III Summit of Iberian and Latin American Universities in Porto Alegre, Brazil in which they declared education as a ‘public good’ and requested their governments not to make any commitment on this issue within the framework of WTO. However, overtime the perception of higher education as a commercial service is gaining acceptance. The WTO Secretariat in September 1998 has mentioned that with the rapid changes in higher education ‘education also exists as a private consumption item with a price determined freely by the providing institutions’. As a result, they have stated that more and more paying students are attracted to these institutions including foreign students.

- 4.3 In 1994, over 140 countries approved the GATS (Global Agreement in Trade & Tariffs), the predecessor to the WTO, which was created later in 1995 to expand trade liberalization internationally. Under Article 3 of WTO the definition of Service is laid down. It is felt that these rules apply to any service except those supplied in exercise of governmental authority. Some people feel that this article excludes public universities. However, the rule further defines that it excludes only those services, which are supplied neither on commercial basis nor in competition with one or more suppliers. Amongst the 12 sectors defined by the WTO as service ‘education services’ also falls as one.
- 4.4 WTO has also adopted the Principle of Most Favoured Nation. This WTO rule, which is binding on all members, will have its implications for educational services. The Principle of the Most Favoured Nation implies that each party ‘shall accord immediate and unconditionally to services and service providers of any other party, treatment no less favourable than it accords to the service and service providers of any other country.’ This means that, if a country allows a foreign institution of a country to provide distance education services, all other countries can request to have the same treatment. Similarly, if subsidy is given to one, others can request the same advantage.
- 4.5 Another important issue of GATS and WTO, which is fundamental to its principles, is the notion of National Treatment. This implies an obligation to treat both foreign and domestic service suppliers in the same manner. It has been contended that this would imply, if implemented rigidly, that a foreign educational institution of, say, distance education, can demand subsidies similar to those received by public universities in an individual country.

Box 1: Principal goals in educational services:

- Ensure right of US companies to establish operations in foreign markets including the right to wholly own these investments.
- Ensure that U.S companies get 'national treatment' by getting foreigners same rights as domestic investors.
- Promote pro-competitive regulatory reform focussed on an adequacy of appropriate and consistent rules.
- Remove barriers to generate cross border trade.
- Remove obstacles to free movement of people and business information.

4.6 In a meeting held in 1992 organized by the US Government along with World Bank and OECD in Washington, the issue of globalization of education was discussed. It was felt that globalization should take place with a human face. The efficiency and needs for market should be balanced by a greater concern for peace, equity, and sustainability.

4.7 World Conference on Higher Education in the Twenty-First Century: Vision and Action held at UNESCO Headquarters in Paris from October 5 to 9, 1998 was attended by nearly 5000 participants representing 180 countries. It adopted an Action Plan for reforms in the field of higher education. Its main theme was that higher education must serve the interest of sustainable development and help build a better society. The main features of the World Declaration on Higher Education adopted in the conference are:

Box 2: Academic Community Perception

- Higher education shall be equally accessible to all on the basis of merit keeping in mind Article 26.1 of the Universal Declaration of Human Rights.
- Higher Education should uphold education's role of service to society.
- Quality of education is a multi-dimensional concept, which should embrace all functions and activities, that is, teaching, academic programmes, research and scholarship, staffing, students, infrastructure, and academic environment.
- Higher education institutions should be committed to transparent internal and external evaluation conducted openly by independent specialists.
- The potential of Information Communication Technology (ICT) should be fully utilized. Equitable access to these should be assured through international cooperation and support to countries that lack capabilities to acquire such tools.
- Higher education should be considered a public service.
- While diverse sources of funding are necessary, public support for higher education and research remains essential to ensure balanced achievement of its educational and social missions.
- Partnership should be forged between higher educational institutions and responsible state authorities.
- The international dimension of higher education is an inherent part of quality. Networking which has emerged as a major means of action should be based on sharing, solidarity, and equality among partners.

4.8 Education is a trillion Dollar industry worldwide. Education industry groups are, therefore, attracted by the prospects of liberalization and globalization of this industry. They seek more international deregulation and generally support WTO efforts. As demands for higher education grow the world over, the governments are also finding it difficult to provide adequate budgetary allocation. GATS covers educational services of all types for all countries whose educational systems are not exclusively provided by public sector or those systems that have a commercial purpose. Hardly any country has education exclusively in the public sector domain and therefore, almost all the world's educational systems come within the purview of GATS.

- 4.9 The GATS covers four types of services. These are:
- Cross border supply of services from territory of one member to another member. Distance education falls in this category.
 - Consumption of a service abroad by the citizens of a member country on the territory of another member country. The most common example is undertaking studies abroad.
 - Commercial presence of service supplier of a member country on the territory of another member country, enabling the supplier to provide a service in that territory. This includes activities carried out by foreign universities or other institutions in another country.
 - Presence of natural persons enabling a form of trade resulting from mobility of people from one member country who supply a given service in another country. In education this would imply courses offered by foreign teachers.
- 4.10 These are the four categories of services defined under GATS/WTO. Any barrier in its free flow is considered to be ‘non-tariff barrier’. The goal of free trade is to remove these barriers in order to gain from further liberalization. In the sector of education these generally refer to government regulations, exchange controls, nationality requirements of students and teachers, non-recognition of equivalent qualifications, and rules regarding use of resources and subsidies.
- 4.11 So far only 40 countries have agreed to the full provisions of GATS. Many have chosen to limit its scope. Higher education services, however, now figure in India’s offer on liberalisation in trade in services that the Commerce Ministry has submitted to WTO in August 2005.

5. e-Education

- 5.1 Not only are commercial business concerns interested in entering the education industry aggressively but existing universities and colleges as well. Private companies like Kaplan, BPP and Apollo Group already run successful edu business

ventures. Kalpan is a big education company owned by the same company that runs the Washington Post newspaper. BPP, its British rival, has entered into deals with British Universities so that students enrolled into their professional courses can earn degrees from the Boston Post Graduate University. University of Phoenix, the first University to offer a full time on-line degree is owned by the Apollo Group. Sixteen of the world's better ranking universities have got together and set up a \$ 50 million joint venture called Universitas 21 Global, an online MBA business school. These universities include McGill, British Columbia, Virginia, Edinburgh, Sweden and Melbourne of Australia. This \$ 50 million project has been established in collaboration with a private company called Thomson Learning, an educational and training service division of the Thomson Corporation. Universitas 21 Global aims to tap markets of potential students from UAE, Singapore, Malaysia, India, Korea and China. It has already enrolled 1000 professionals from 45 countries for its graduate programme. It has also offered an M.Sc. in Tourism and Travel Management recently. The online degree of Universities 21 has been well received in the world market and the degree certificate awarded by it bears the crest of all the 16 top ranked participating universities.

5.2 Insofar as India is concerned, on-line education, which is very crucial for the Indian population, is heavily dependent on reliable high-speed Internet coverage. As a pre-requisite to expansion of on-line education services, it is essential that various parts of the country be connected with high speed Internet. As more and more cities in India are coming within the ambit of high speed cyber-network, the concept of e-education, especially at higher levels should be viewed seriously. Most Indian Universities make little use of the Internet in improving administrative efficiency. Broadband subscribers currently total to just 0.61 million as compared to the target of 3 million set for December 2005

5.3 United States is now the leader in e-education. Phoenix University, the leading on-line University, has the largest number of on-line students enrolled. In the early

1990s it became the first university to offer degrees online, and the internet is now an integral to all its teaching. (see *Survey: Higher Education in Economist* September 10th-16th, 2005, after page 50). A number of existing universities have offered on-line courses, but many have preferred not to use their own names directly as they feel it may reduce their public standing.

- 5.4 E-learning, however, as additional support to existing courses, is already highly successful in the West. In Beaconsfield, a shopping mall in the UK, Explore Learning Centres have been set up. While their mothers shop, children in the 5-14 years group can visit the centres within the supermarket area for a new e-learning experience. There are tuition websites in the UK where over 280 tutors are offering their services at £ 15 to £ 25 per hour. Internet base e-tutoring or on-line tutoring is catching up in India as well. Tutor-Vista, a company set up in Bangalore provides Indian teachers in English, Maths, Physics, Chemistry and Biology for 3rd to 12th grade students in UK and the US charging less than half the local rates. The session is interactive with use of head phones and micro phone.
- 5.5 E-learning has clearly percolated even to the school level. India's education policy has largely missed out on taking advantage of this technological revolution in education. E-learning is not only inexpensive, but also convenient. It also does not force the student to relocate or forgo earnings from full time or part time employment that the student may be engaged in.
- 5.6 Good quality, market based e-learning courses and Internet café/schools with programme structures that are relevant to the Indian context need to be set up urgently. Libraries must be equipped with computers that support high speed internet connectivity . To bridge the digital divide we need all night net libraries or late night accessibility at least, at a monthly charge, of course.. Such internet cafes could be provided under private or co-operative licences in residential areas including slums. Personnel trained in computers and e-learning tools could man these edu-cafes and help students make better use of the facilities. The cost of e-

learning, while market driven, could perhaps be subsidized through need based scholarships schemes.

- 5.7 High speed internet connection is an essential pre-requisite to wide spread e-learning. US scientists have revealed details of a US\$100 wind-up laptop which they expect to produce globally and extend computer and internet access to hundred of millions of world's poorest pupils. (*Times Educational Supplement*, 7 October 2005). In India, a cheap handheld computer designed by Indian scientists was launched in 2004 after a delay of three years (see BBC News, Monday March 29, 2004, 'Simputer for Poor goes on sale'-bbc.co.uk). The Simputer is a low cost portable alternative to PCs, by which the benefits of IT can reach the common man. A wind-up computer machine and with a wifi wireless internet connection, may well be within the reach of the Indian student community even in remote locations with poor electric supply

6. Academic Community on Globalisation:

- 6.1 While the academic community has not reacted positively to globalization, many developed governments see it as an opportunity to expand its educational services. In a report prepared on Globalization & Education, for the House of Lords, it has been stated that the UK Government is 'not just concerned with smoothing the way for the "businessification of education" to the extent the profit making for "edu business"' becomes possible but also is concerned to build up an indigenous edu-business and to develop export potential for that.'
- 6.2 According to this report a more powerful version of GATS will be a place which will ensure that educational services will be progressively commercialized, privatized, and capitalized. The report further says that globalization is already taking place involving standardization of culture summed up with the concept of 'McDonaldization'. International brands in consumer products are being embraced on a global scale with trans-national institutions taking account of local legal codes, currencies, local tastes, habits, customs and adjusting to a new international order.

Communication through Internet and e-commerce has further changed the method of transacting business. The rise of global authorities like WTO & GATS and their Dispute Resolution Mechanism has far reaching consequences for globalization. Further, WTO's 'enforceable global commercial code' has made a real impact. As a result, major corporations have now lobbyists settled permanently at WTO headquarters in Geneva and Representatives of Corporations sit on some of the many Committees and Working Groups of WTO. WTO has thus facilitated incremental freedom for trans-national capital 'to do what it wants, where and when it wants'.

- 6.3 For a public service such as education GATS at Doha was a stepping stone so that there is no discrimination against foreign corporations entering the service market. Further, after the fizzling of the dot.com bubble, corporations are looking forward to other service sectors for investments, education being one of them.
- 6.4 The report informs the House of Lords that in the above scenario, the British Government may look to public services in general as an export earner. It highlights that this is already happening in the U.K. in education business. North Anglia is already exporting services to Russia, Ukraine as well as running schools and local educational authority services in the U.K. itself. Wigan & Leigh has 15,000 students to 26 countries including 10 campuses in India (*Hindustan Times* 20 November 2005, New Delhi). Many British Universities have franchised operations and deals with other colleges and universities outside the U.K. University Schools of Education generate income through consultancies that have advised countries like Chile, Poland, and Romania on how to restructure the school system. Britain exported £67 million worth of such services. The report does recommend in the end that the Select Committee of the House of Lords should consider limits to business take-over of education. It further stated that exempting education institutions from GATS altogether is ultimately good for education and democracy.

Section III

KNOWLEDGE ECONOMY: THE INDIAN CONTEXT

7. New Trends in Knowledge Economy

- 7.1 India's higher education policy of the 1950s , which envisaged schools of excellence, especially in technology and sciences, has finally paid off rich dividends. The creation of IITs, IIMs, Schools of Science, Schools of Law, a large number of advanced training and research institutions have now been well and widely accepted.
- 7.2 Doctors trained in India have been the backbone of the British Medical Service for many decades. Indian scientists have found positions of importance in research laboratories of the US and other developed countries. But it was the IIT engineers who have finally struck gold during the dot.com boom of the 1990s and brought the final recognition and testimony for Indian competence. Of about 140,000 graduates of IIT so far, roughly 40,000 have gone to the US. They have been given the credit of creating 150,000 jobs and \$80 billion in market capitalization. It is said that when a new IT company is launched, investors inquire if there is an Indian in it. In the second meeting of IIT Alumni in the US, prominent persons like Jack Welch of GE, Larry Summers, President of Harvard University, and Tom Friedman, the globalization columnist of New York Times were present. The states of Virginia and Maryland declared the month of May 2005 as IIT – Indian American Heritage Month. Further, 55 US Members of the House of Representatives co-sponsored Resolution 227 honouring 'the economic innovation attributable to graduates of the Indian Institute of Technology'.
- 7.3 With so much of admiration and brand equity for Indian technology and knowledge sector, it is time for India to cash in on its advantage. How can this be done?

- 7.4 We need to look at the United States and its economy. The US has been the undisputed economic leader since the Second World War. One of its great strengths has been its educational system – especially institutes of higher learning, as well as its research laboratories. For example, Colombia University is credited with 47 Nobel Prizes. Companies like Microsoft, Hewlett-Packard (where Silicon Valley really began), Yahoo and Google were each started by University students. Venture Capital as a financial engine for encouraging pioneering innovation started in the US. The Patent registration system of the US remains one of the best.

8. Advantage India

- 8.1 Now in the era of reverse brain drain, the IIT graduates increasingly prefer to return or remain in the country. It is stated by some that Bangalore today has 150,000 software engineers compared to 130,000 in Silicon Valley. According to Computerwise, the top 50 global IT service firms alone target raising India's headcount from 173,000 in September 2004 to 500,000 by end of 2005. (see Sheshbalaya, Yale Global online: www.yaleglobal.yale.edu)
- 8.2 According to NASSCOM, India had a total of 650,000 IT professionals in 2002 and by February 2005, they were to rise to 813,500. According to Brainbench Inc., India ranked behind the US in the number of certified software professionals (145,517 against 194,211) The Indian figure was 30 times larger than Europe's top country Germany (4802) and one hundred times Chinas (1325). India, therefore, does have an overwhelming lead in software. Further, leading US IT firms have their CMM Level 5 certification in India, rather than in the US. The High Technology leadership of the US is now coming under threat from India. In a paper published by Richard Freeman of Harvard University quoted by Sheshabalaya, the employment at General Electric Company's Global Research Headquarters in New York is being surpassed by their own facility, the Welch Centre at Bangalore. (see Ashutosh Sheshabalaya, *'Rising Elephant-the Growing Clash with India over white-collar jobs and its Challenge to America and the World'*, Macmillan India, 2005) Similarly, IBM cut its jobs in the US and Europe

but recruited more in India. In another surprise move, in just 2 years, the Indian R&D Centres of Bell Laboratories, the world's largest research organization, filed more patents than the US Labs. In August 2006, India announced 1312 applications for drug patents, a record second only to the US. It is 25 per cent higher than Germany which is the third in ranking, and ahead of Britain, Japan, etc.

- 8.3 India, is therefore, not just at the lower end of the software and research business, but is now in a leading position of the scientific and financial research revolution. This is also confirmed by the massive market value of IT firms on US stock markets which indicate that the investment community endorses this view. According to current thinking an estimated \$356 billion worth of global financial services will relocate to India in the next 5 years, producing a cost saving of \$ 130 billion for top 100 financial service firms.
- 8.4 From R&D and scientific research, Indian commercial research market has further widened to financial and economic research. It has been said that Wall Street is also outsourcing white-collar jobs to India as a reaction to the local scandals, which erupted in 2002 and 2003. Already McKinsey & Co. and AT Kearney Inc., have shifted bulk of their research to India. J.P.Morgan, Moran Stanley, Deutsche Bank, etc. are all considering the same.
- 8.5 In the health sector, the story is the same. According to McKinsey & Co's forecast, India will earn \$2 billion a year by 2012 from 'healthcare tourism'. Peter Dracher has noted that the Indian medical schools in New Delhi are the best in the world. Indian hospitals already treat over 150,000 foreign patients a year and India is emerging as one of the most sought after medical destinations in Asia for offshore patients. The 30 hospitals under the Apollo Group are believed to have over the period treated 60,000 foreigners. Escorts Heart Institute and Research Centre has a large number of foreigners coming in every year looking for high quality cardiac care. The cost of treatment and surgery is 25 per cent that of the UK.

- 8.6 In more fundamental research, Mosanto has set up a massive R&D facility within the Indian Institute of Science, Bangalore. Indian biotech firm, Shanta Biotechnics stunned the scientific community with r-DNA based hepatitis vaccine (see India Infoline, September 9, 2000). Work on genetically modified food is going on full swing in India. Institute of Genomics and Integrative Biology (IGIB), based in New Delhi, has discovered these new genes of SARS virus.
- 8.7 The biggest company in the world – GE has announced that their R&D centre at Bangalore will take up 30 projects underway in the US. This is their biggest facility outside the US where 1800 engineers with a quarter of them holding PhD degrees are engaged in fundamental research. Oracle, the famous software company has 7000 employees in India, mostly engineers (*Business World*, 21 November 2005).
- 8.8 India is, therefore, fast moving up the value chain in all aspects of scientific and financial research from software to medical to biomedics. There are already more software experts in Bangalore than in the Silicon Valley. As *Business Week* ('The other MIT' 22-29 August, 2005) has concluded, 'unlike China, India's significant cheap labour is not a pool of factory workers, but a huge crop of scientists'. In the same view, Singapore Prime Minister has reportedly stated that while China has become the world's factory floor, India has become its IT and back office! However, China is very keen to seek a piece of the IT pie. At 2005 China IT Service Summit, an international event organized by International Executive Association in New York, attended by 100 persons representing leading companies, it was clear that China lags behind India in the global market for IT. According to analysts the world's outsourcing business is currently about US\$ 20 billion and India holds about 90% of it while China earns only \$ 600 million. But this should not lead to complacency.
- 8.9 Sixty years after independence, India is again at crossroads. We still have a large population under the poverty line. We have a very large number of illiterates.

School education, both primary and secondary are inadequate considering the entire population. The dichotomy lies in the fact that we also have the largest pool of scientific and knowledge workers. We produce 400,000 engineers a year compared to around 60,000 in USA (*Business Today*, 4 December 2005). We have had great success in entering the service sector through new communication technology for not only low-end backroom service work, but also top end R&D. We should not allow the present advantage to slip away. Our unique selling point is the pool of skilled manpower, which we need to continue to grow to maintain our competitive edge. Further, Bangalore may have come up as a rival to Silicon Valley, but it is congested and wages and attrition rates are rising. We need to develop another twenty Bangalores in locations, which are cheaper. We can only do this when our supply of skilled manpower continues to grow, keeping wages stable and moving more and more Indians into the mainstream of economic growth.

9 Mainstreaming India

- 9.1 India today is definitely at par with the knowledge sectors of the top economies of the world. Extensive fundamental and applied research is being undertaken here. The world's biggest multinational companies are not only opening their backroom offices, but also their R&D centres in India. This trend is apparent not just in software development but in other sectors as well such as financial sector, medical sector, biotech and others. By mid 1990s, almost 180 of Fortune 500 companies were outsourcing to India. World famous names like Citicorp, Honeywell, Motorola, Sprint, Oracle, Digital Equipment, Verizon, Huges, Duet Technologies, Cisco Systems, Texas Instruments, Computer Associates, Pentafour, Eco Soft, British Telecom, SAP, Philips, Siemens, Yahoo, Google, Accenture, Sun Microsystems, Ericsson, IBM, 12 Technologies, HP, Intel, Microsoft, Nortel, etc., have all set up R&D facilities in India or have tied up with Indian companies or academic or research institutions. The cost advantage for higher research is huge. An Indian chip design engineer costs Rs. 13.5 lakh a year compared to Rs 67 – 90 lakh in the U.S.

- 9.2 Professor Jagdish Bhagwati, eminent International Trade Economist of Colombia University, speaking at the India Today Conclave 2005¹, stated that with the high level of skilled diaspora, which grew up at the expense of Indian exchequer, we should now think of the return of the 'Brain Drain'. He stated that today the Brain Drain template has been discarded and we no longer think of skilled migration as a threat. However, it is certainly an opportunity. He further stated that skilled Indian Diaspora is huge and growing. Between 1990 and 2000, Indian born residents in the US doubled to over just one million. But they were rich in human capital earning a total income that exceeded \$40 billion in 2000, roughly 10 per cent of India's gross domestic product or national income. Indians are next only to the Jews in affluence as the richest ethnic minority in the US. He then introduced the concept of 'Trojan Horse'. We are taking on America from within. You can get inside and work from within. We, therefore, profit from globalization and we also need global markets.
- 9.3 What are the advantages to India following the Trojan Horse Principle? The main advantage is that with people of Indian origin will hold offices in critical decision making capacities in the US and other developed countries increasing the market acceptability for outsourcing to India.. Further, this is done by both ethnic Indians and other nationalities, who see Indians doing well in their countries. It is, therefore, to India's advantage to supply skilled manpower to the west as well as develop our own knowledge-based economy.
- 9.4 Our main concern now should be whether we are capable of continuing support to such a large influx of R&D, backroom office functions from the world's service sector. If India is to be host to the R&D and backroom facilities of the world's best and largest companies, we need to gear up our higher education institutions to meet the growing demand for qualified persons.

¹ India Today International, 21 March 2005

9.5 India has been lucky, more by accident than by design, that it was able to offer to the world a pool of skilled, scientific, English speaking manpower immediately after the communication boom through development of internet and satellite communications. At a time when India's higher education policy was under attack from the traditional advocates of the concept that 'over-education' leads to educated unemployment, this came as a happy and welcome development. Converting this liability to our advantage through development of new communication technology has been a triumph to reckon with.

9.6 Unfortunately, there is no cogent plan in the Government policy scheme on how we could continue to meet the challenge of providing the skilled manpower that is required by various sectors of the economy. As India grows into a knowledge providing superpower, a host of facilities will need to be provided in terms of ensuring a steady supply of quality knowledge worker with the requisite qualifications. Some of the features of the Indian Education system and its Higher Education System are described in this context in the following paragraphs.

10. Structure of Higher Education in India:

10.1 Over the last 50 years, the Government of India has provided full policy support and substantial public funds to create one of the world's largest systems of higher education. These institutions, with the exception of some notable ones, have however, not been able to maintain the high standards of education or keep pace with developments in the fields especially in knowledge and technology. Over time, financial constraints with exploding enrolments, and a very high demand from primary and secondary education has led to the deterioration in the financial support provided by the government. On top of this, an overall structure of myriad controls with a rigid bureaucracy has stifled its development. In terms of higher education, however, on the science and technology side, India has however built up the largest stock of scientists, engineers and technicians.

10.2 The growth of higher education in India has been phenomenal. Starting with 1950-51, there were only 263,000 students in all disciplines in 750 colleges affiliated to 30 universities. This has grown by 2005 to 11 million students in 17,000 Degree colleges affiliated to 230 universities and non-affiliated university-level institutions. In addition, there are about 10 million students in over 6500 in vocational institutions. The enrolment is growing at the rate of 5.1 per cent per year. However, of the Degree students only 5 per cent are enrolled into engineering courses, while an overall 20 per cent in sciences. The demand for professional courses is growing rapidly.

10.3 In India both public and private institutions operate simultaneously. In 2000-01, of the 13,072 higher education institutions, 42 per cent were privately owned and run catering to 37 per cent of students enrolled into Higher education, that is, approximately 3.1 million out of total 8.4 million. It is also likely that most of the growth in the rapidly expanding higher education sector took place in private unaided college or in self-financing institutions. Since grant-in-aid to private colleges is becoming difficult, many governments/universities have granted recognition/affiliation to unaided colleges and many universities have authorized new 'self-financing' courses even in government and aided colleges. It is felt that as of now more than 50 per cent of the higher education in India is imparted through private institutions, mostly unaided.

10.4

Main players in Indian Higher Education

- University Grants Commission (UGC) set up under UGC Act 1956 is responsible for coordination, determination, and maintenance of standards and release of grants to universities and research organizations.
- Professional councils that are responsible for recognition of courses, promotion of professional institutions and provision of grants to undergraduate programmes.

As of today software development does not have a statutory council. NASSCOM is generally accepted as equivalent of a council.

Research Councils: A number of them have been setup under the Central (federal) government.

- 10.5 Government has created 221 Universities of which (6 are central Universities while 156 are state Universities). There is also a concept of Deemed University. This status is given by UGC to colleges of exceptional excellence. There are 39 Deemed Universities plus seven open universities. There are 9703 colleges in India that provide mostly bachelors or sometime Master's level of education. Of these, only 550 are engineering and technical colleges, 655 medical and 600 management institutions.
- 10.6 Insofar as Universities are concerned, only the central or State Government can open a new university and that too by legislation in the Parliament or State. Universities are empowered to award their own degrees and take affiliate colleges. But UGC is empowered under its Act to grant institutes of excellence 'Deemed University' status which they have done in 39 cases. There are, however, no private Universities so far. A Private Universities' Bill has been proposed in the Parliament, but has not been approved so far. All self-financing colleges, therefore, have to also seek affiliation with a University.
- 10.7 All of India's higher education is thus managed by the UGC and the various Councils. The UGC, established by a statute 1952, has been empowered to promote and coordinate university education in India and also approve grants to them.

Accreditation:

- In order to evaluate performance of an institution and bring about a measure of accountability a mechanism of accreditation has been developed by UGC. This is an autonomous council under UGC called National Accreditation and Assessment Council (NAAC) with a purpose to carry out periodic assessment of universities and colleges. NAAC has evolved a methodology of assessment which involves self-appraisal by each university/college and an assessment of the performance by an expert committee. Similarly, for technical education AICTE has established its own accreditation mechanism for its institutions through the National Board of Accreditation (NBA). NBA has also undertaken a detailed exercise for benchmarking the performance of reference for evaluation if performance can be initiated.
- Both NAAC and NBA are in the right direction and need to be encouraged and strengthened. However, so far only 47 universities, 75 affiliate college and 20 autonomous colleges have volunteered to be accredited by NAAC. Some more universities and 25 more colleges are in advanced stage of finalizing self-study reports. There is a need to link up grants and loans to NAAC and NBC reports. This can be done when NAAC and NBC is made applicable to all Higher Education Institutions. UGC has already indicated that development support will be related to outcome of NAACs report.

10.8 **Vocational Education:** One of the streams of higher education is vocational education. For this a network of public and private polytechnics and vocational institutions exists, controlled and supervised by the Councils specializing in each discipline. There are nearly 10 million students in 6500 such institutions.

10.9 Integration of University and vocational education has been attempted in India as it was earlier attempted in Australia. In a recent innovation, vocational curriculum has been introduced at the bachelor's degree level by permitting one of three subjects to be a vocational one. A number of subjects have been introduced including agriculture-related activities. Nearly 1500 colleges have been given facilities for vocational education.

10.10 **Research and Development:** while R&D centres have been established in many disciplines, the concept of centres of excellence in different subjects has led to the

establishment of Centres of Advance Studies (CAS), Department of Special Assistance (DSA) and Inter-University Research Centres of internationally comparable standards. The objective of these centres is to provide quality inputs in higher education and research areas. Further, to cut costs of undertaking good research, especially in sciences, Inter University Centres in nuclear science, crystal growth, astronomy and astrophysics, social sciences and humanities have been formed.

10.11 With India emerging as a global hub for commercial R&D (*India Today International*, 3 Oct 2005), R&D within the scope of Higher Education has gained greater importance. It has been stated that 150 international firms have set up R&D centres in India and in 2004 US patents office granted over 1000 patents to Indian units of US companies. Indian companies have also started to increase their R&D budgets. The demand for high quality researchers will require expansion of postgraduate research and PhDs in Indian institutions of higher learning. According to Saikat Chaudhory, a Management Professor at Wharton, India needs to improve its research atmosphere in its universities. This is perhaps, already happening. If we look at that the CSIR, the number of US patents granted to it has jumped to 196 in 2005 from just 6 in 1990-1. Indian Research Councils should now have the potential to raise research funds through industry and perhaps, capital markets. A mention must be made of SPREAD – Sponsored Research and Development of the ICICI Technology Financing Group which is helping finance commercial R&D. Similarly, Nirma Labs provides up to Rs 20 lakhs as grant. We need to expand such support to R&D activities.

10.12 **Open University System:** India has also developed an open university system to encourage distance learning. Indira Gandhi National Open University (IGNOU) was the pioneer and now there are seven open universities in India offering over 500 courses. IGNOU has about 11,87,100 students on its rolls. Modern communication technology can be harnessed to effectively provide education

through this medium. A distance education Council has been set up and a common pool of programmes is available for sharing.

- 10.13 Open Universities can be highly cost effective as the cost of teaching through distance education comes down to a third compared to the traditional system. They also maintain a close relationship with the industry and is specially helpful to those who cannot afford a regular university degree due to high cost or lack of time as they are already employed.
- 10.14 Distance education with new information and communication technology promises to expand the frontiers of Higher Education as never before. This is because it costs 66 per cent less and the students need not leave their homes or profession. The internet and satellite technology are being put to use to further the cause of distance education. The Indian Space Research Organization (ISRO) is launching a dedicated satellite for educational purposes.

11. Public Spending on Higher Education:

- 11.1 **Public Expenditure on Higher Education in India:** India has developed one of the largest system of Higher Education in the world with over 230 universities and 6500 vocational colleges catering to about 10 million students . Most of these are publicly funded although some may be privately run. The financing of higher education, however, is often reprioritised due to competing demands for budgetary funds from primary and secondary education sectors. As a proportion of GNP Higher Education was only about 0.19 per cent in 1950-51. By 1980-81 it went up five fold to 1 per cent but by mid-1990s it dropped to 0.4 per cent. In the government plan outlay the share of higher education doubled for 9 per cent in the first five year plan to 18 per cent in the second. It increased to 25 per cent in the fourth but has now come down to 15 per cent in the seventh five year plan. In the eight five year plan it was around 8 per cent. It may be stated that the non-plan expenditure in education is huge compared to plan expenditure.

- 11.2 On the source of funding, the share of government expenditure (both state and central) increased from 49 per cent in 1950-51 to 76per cent in 1986-87. The share of non-government sector, which in India is largely student fees, declined from 33per cent in 1960s to less then half of what it was in 1950s. The share of ‘other sources’ that is, voluntary donation, endowments etc also declined. The issue of raising fees in government aided colleges and vocational institutions remained enmeshed in politics. As a result, this source which could potentially provide approximately 20per cent of the funds is currently funding barely 3per cent of the cost of education.
- 11.3 Resource crunch in higher education is being felt in a serious way. Other sources of financing besides the government have to be developed so that the massive expenditure required to expand, improve and bring it to world standards could be carried out. With an expanding middle class and globalization this is possible provided innovative policies are formulated and implemented.

12. Promoting Knowledge-based Economy: The Need

- 12.1 According to BPO watch newsletter, India has within its reach, an unprecedented opportunity to become the back-bone to global enterprises by delivering ‘end solutions’. This is based on a study *‘Beyond Cost Reduction : Risks & Rewards of Services Sourcing’*, conducted by H. Wadhwa and Harpreet Khurana at the Columbia Business School. The study provides an idea about the potential of ‘Knowledge hubbing’ out of India. However, according to the Colombia Business School study, as more high-end processes are outsourced to India, attrition at India centres is becoming an increasing problem. This is a manifestation of the shortage of quality skilled manpower availability in India. Unless India and the Indian Government takes seriously, the issues involved in providing higher education and increasing its accessibility, especially in subjects and areas where it is required most, we will fall behind and lose our lead.

- 12.2 NASSCOM President, Kiran Karnik in a Seminar at Chennai on 'Knowledge Process Outsourcing - Generation Next' said that Indians have neglected certain disciplines like econometrics and operations research. 'Many brighter students are moving away and we need to bring them back'. The growing KPO provides service on research on subjects such as intellectual property, financial analyses, business and market in telecom, pharmaceutical, automotive and financial service sectors. World Bank in its latest report 'India and the Knowledge Economy; Leveraging Strength and Opportunities' (Report number 31267-IN, April 2005) has concluded that while India has made enormous strides in its economic and social development in the past two decades, it can do much more to leverage its strengths in today's knowledge based global economy. It argues that with the right kind of government policy incentives, the country can increase its economic productivity and the well being of its population by making effective use of its knowledge. It further states it needs to make its education more 'demand driven' to meet the emerging needs of the economy and to keep its highly qualified people within the country. *This means upgrading quality of all higher education institutions*, not just a few world class ones like the IITs. It has further analysed that in order to make education demand driven we need to allow private sector to enter higher education by *relaxing bureaucratic hurdles and putting an accreditation system in place for private providers of both higher education and vocational training*. This will also involve university and industry participation, which is currently lacking. Dependence on distance learning technologies needs to be increased substantially.
- 12.3 The Report further states, 'India needs to maintain and enhance its competitive advantage of abundant, high quality and cost effective human resources. It also says that it needs to ensure the right mix of technical, business and functional skills in the work place to meet the needs of individual business segments' (P109). The report also goes on to state that India produces 120,000 graduates in IT per annum from a variety of institutions. It estimates that even though one million people are employed in India's IT sector, India could face an estimated shortage of 65,000 to 530,000 IT professionals by 2005 depending upon the market conditions. Indian

software companies are now increasingly concerned over brain-drain, since there is now substantial internal demand to be met. It has been felt that India may not be able to produce enough number of good engineers and IT professionals to meet the expected growth in IT in the coming years. Therefore, according to the Report, there is a need for rapid expansion of suitable training opportunities at home. Fortunately for India many private IT training institutes are offering focussed training to young professionals such as NIIT and the Internet Training Centre Initiative for Developing Countries, developed by ITU and CISCO Systems. India, therefore, cannot afford to be complacent about its current position in the Global IT market and needs to revamp its higher education and technical training. *Economic Times* carries on its editorial page dated 8 November 2005 the information that as per an ET Survey of 200 large private companies in India, the total wage bill for these companies has gone up by 23.50per cent in present half of fiscal 2005-06 over last year. However, such wage bill rise is not being offset by productivity gains. This is especially true for sectors such as information technology. For large 11 software companies, the wage bill shot up by 42.5per cent and the share of wages in sales went up from 37.9per cent to 42.5per cent. According to the analysis, given this trend, India would soon lose its competitive edge unless it increased its pool of trained manpower in requisite skills and keep the wages down. In fact there is a fear that some BPO centres might close down in India due to poor turnover, higher attrition rate and even higher wages than some other countries. Brightview, an internet service provider is shifting its operations to South Africa. Grupo Santander of Spain, owners of Abbey National Bank of UK, view their India operations as costly failure because of 'language difficulties'. This is likely have an impact on other companies as well.

In contrast to the policy environment within which we are functioning, our competitor governments are clearly taking much more active interest in catching up with the crest in the knowledge sector growth curve. China has reportedly decided to set up dozen of IIT-like engineering schools and 20 Harvard-like Universities. Chinese educators like Vice-Chancellors etc. have been travelling across western

countries signing up MoUs/Agreements with a large number of universities for educational tie ups while India remains suspicious of foreign universities and resent their intrusion into the country. This needs liberating education from the clutches of government control.

- 12.4 According to NASSCOM, 10 million jobs will be available by 2009 to the Indians in service sector including IT enabled sectors. This will involve opening of the service sector under WTO. However, the moot question is can India supply the skilled manpower for the potential 10 million jobs!

Box 3: Main features of Indian Higher Education system

- Highly bureaucratized system with multiple controls and regulations exercised by Central and State Governments, statutory bodies (UGC, AICTE and others), university administration and local management.
- System is heavily subsidized by the Government. Up to 90per cent of the operating costs are paid for by the state. The efficiency of fund utilization is very poor due to internal rigidities.
- Salary and compensation for teaching staff is poor and, therefore, higher education institutions are unable to attract and retain qualified and trained teachers. Besides unattractive compensation packages, recruitment procedure is lengthy and working environment not conducive to retention. As a result, a substantial proportion of high-ranking students who could fill up such assignments prefer to work elsewhere or go abroad. In a recent move UGC has further damaged the pay and promotion prospects of college teachers by reducing promotional grades thereby creating more stagnation and frustration amongst college teachers. (*Economic Times*, 15 November 2005).
- Most institutions offer outdated programmes with inflexible structures and content. While course content has been updated and restructured over time in the world's best institutions, Indian university curricula have lagged behind.
- Infrastructural facilities range from inadequate to dismal. Classrooms are often unattractive and laboratories inadequately stocked, leading to poor teaching. It is estimated that barely 20per cent of the institutions have the basic minimum laboratory equipment.
- Steady electric power supply is not available. *Laboratories are poorly stocked* and computerization, where it exists is generally dependent on poor communication lines.

Section IV

SUPPLY AND DEMAND FACTORS IN HIGHER EDUCATION IN INDIA

13. Regulation in Higher Education

13.1 According to Pratap Bhanu Mehta, the debate over regulation of higher education is highly charged with images of private operators charging exorbitant fees, poor quality, financial barriers to the entry of deserving students, etc. (See *Regulating Higher Education published in three parts in the Indian Express*, New Delhi Edition on July 14th, 15th and 16th, 2005- also posted online in www.indianexpress.com). According to him, the executive in India has abdicated its responsibility of providing sensible policies for education and judiciary has stepped into the vacuum without fully understanding the overall objective. On the demand side, we need to have clear objectives. These are as follows:

- The gross enrolment rate of higher education in India is roughly 6per cent. This will need to be doubled in the next decade. This involves thousands of crores of Rupees of investment. Since the Government will not be able to meet the requirement, all other sources of funds need to be tapped as well. There is a serious mismatch of demand and supply.
- The size of demand and its projected growth, clearly indicate the need for new institutions imparting quality education in subject areas of contemporary relevance and job opportunities. Quality can be ensured only if there is sufficient competition among institutes to attract talented students and provide choices and innovative subject combinations. Unfortunately, the Indian regulatory regime tends to stunt supply rather than increase it.

- There is no doubt that an ideal education system should be without any financial discrimination. However, fee caps tend not only to bring down quality but also reduce overall supply of education. Under these circumstances, there is a great need to go in for major financial innovations in education planning both at student financing level and also at the level of educational institutions.
- 13.2. There is an effort on the part of the Government to block the entry of foreign universities into India. While Singapore, Dubai, Bahrain and China are encouraging foreign universities to set up operations in their countries so that students can have easy access to degrees from those well recognized universities, there is a tendency to block such entry into India. There is a statutory requirement of partnership with Indian institutions, which curbs their autonomy and their standing or 'brand equity' in the market. Restriction on foreign investment in higher education is biased against economically weaker students, who cannot afford to go abroad and acquire foreign degrees.
- 13.3 Entry of foreign universities into India, like foreign investment, should be allowed freely, placing restrictions only on universities and institutions based on religious affiliations. BWe should welcome foreign universities to set up campuses, with or without their own investment, in India. This would also make our universities and colleges more conscious of the current global best practices and more competitive from the demand point of view.
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Box 4: Regulatory Framework in India

- Universities in India are set up either through state legislation or through the acquisition of a 'Deemed University' status through UGC. While a number of universities have Deemed University status, institutions offering traditional undergraduate degrees do not have this option open to them. In a Supreme Court judgement in the Chattisgarh case, the Court had decreed that each University set up should not only conform to the UGC norms but also be created through a legislation. This makes setting up of universities not only a long and tedious process but also a costly one. In a similar way, AICTE used to collect a deposit per course of up to Rs 50 lakh, which was held in a joint account for 10 years. Such measures increase the cost of setting up institutions.
- There have been some court decisions in India which could be considered regressive. In a recent decision in the 'State of Andhra Pradesh vs JB Education Society' (date? No? reference?) the Supreme Court held that consent of State Government is necessary before starting an Engineering College and AICTE cannot give such a consent on its own. In fact, the judgement has gone out of the way to give quasi-monopoly power when it states "the State Authorities can alone decide about educational facilities and the needs of the locality. If there are more colleges in a particular area the State would not be justified in granting permission to one more college in that locality." With this, the Supreme Court has done away with the concept of educational centres. Many areas like Boston in the USA have grown as educational centres and provide many common facilities and an academic environment conducive to higher education. Agglomeration of education institutions has been well accepted world wide and the State of Haryana has declared setting up of a 'Education City' in its State. All this will go against the spirit of the Supreme Court judgement. Karnataka, Andhra and Tamil Nadu in India are examples in this context where many private colleges have found a base in a region and are doing well.
- Regulation, therefore, needs to be well structured and thoroughly researched to take full account of relevance, requirements, practical constraints and market realities. The objective of encouraging growth of educational institutions rather than restricting them should not be lost sight of. The Honourable Supreme Court has once again been restrictive in its judgement in Tamil Nadu vs Adhiyaman Educational & Research Institute in which it has further defused the powers of the UGC. With this judgement, it has gone in for harmonization of education to remove disparities of standards and also for future occurrence of such disparities. With this judgement, the concept of distinct quality of each institution gets a blow and should not be accepted.
- Education is no longer a uniform harmonized affair. Higher education offers a wide variety of subjects and with continuing education it needs to be demand driven. In this context, while we need to reduce regulation at entry point, we do not need to bring in the concept of accreditation.

14. Government Control over Private Education Initiative: Some evidence

14.1 There are two types of private higher education colleges/institutes – aided and non-aided. The aided colleges/institutes are supposed to get up to 95per cent of the teachers’ salary bill reimbursed. The unaided ones have no access to government funds and they run their colleges on higher tuition fees as well as grants/donations.

14.2 There has been a continuous attempt by the Government to interfere in the working and admissions policy of even the unaided institution notwithstanding Article 30 of the Constitution, which provides for fundamental right to “establish and administer educational institutions of their choice”. This has led to a number of landmark cases in the Supreme Court. Chronologically, they are as follows:

1. Unni Krishnan case 1993: Supreme Court and its review in 2002 by Full bench of Supreme Court.
2. TA Pai Foundation vs. State of Karnataka and others Supreme Court 2002
3. Islamic Academy Case 2003: Supreme Court
4. PA Inamdar vs. State of Maharashtra: Supreme Court (7 judge bench)
Appeal
(Civil) 5041 of 2005

In 1993 a Unni Krishnan’s case the Supreme Court held that privately unaided colleges were legally bound to provide heavily subsidized professional education to students qualifying under Common Entrance Tests (CET). It further laid out an elaborate scheme under which top ranking students would be admitted at low tuition fee.

In TMA Pai Foundation vs. State of Karnataka (2002 8 SCC 481), the Supreme Court ruled against the prevalent practice of State Governments. The common practice is of appropriating more than 60-85per cent of the seats in the 327 medical and 1345 engineering colleges across the country which are privately promoted and unaided. These seats are then allotted to students topping common Entrance Tests.

However this view was reversed by the Supreme Court in *Islamic Academy vs. Union of India* (2003 SCC 677) which directed all State Governments to constitute separate admissions and fees fixation committees headed by retired high court judges.

However, in *PA Inamdar vs. State of Maharashtra*, Supreme Court 2005) the case was upheld and reaffirmed the 11 judge bench judgement in *TA Pai Foundation* mentioned above. This turned the political class against the judicial order and united them in bringing for the formulation of a draft 'Private Professional Education' Institutional (Regulation of Admission and Fixation of Fees) Bill of 2005 whose purpose has been to nullify the judgement of Supreme Court in the *TA Pai* case.

There is a definite clash between the judiciary which is taking into account the constitutional provision with regard to education and the legislative along with the executive which wants to appropriate the private non-aided education without putting in any budgetary funds.

15. Demand Side

- 15.1 On the demand side, it may be stated that while merely 6 per cent of Indian students who clear the secondary level, choose to pursue higher education, in absolute numbers this 6 per cent amounts to a lot of students. The dichotomy lies in the fact that India's mammoth higher education system, which is still inadequate to cater to the number of aspirants for higher education, is on the other hand churning out many more graduates from its middle and lower level institutions than can find suitable employment.
- 15.2 Why is this so? (i) opportunities for viable employment are limited, (ii) there is a mismatch between the degrees available in the market and the demand for employment. Hence, we find shortage of skilled manpower in critical fields along

with chronic oversupply and resulting unemployment of graduates in conventional fields.

- 15.3 With globalization, there is a great need for Indian higher education to provide a platform for gradual integration of its degrees with the best available in the world. This is so because as mobility of skilled manpower increases and India evolves into a knowledge-based society, skilled professionals from India will be in great demand both in India and abroad.

A major shortfall in this direction is the inability of our institutions of higher learning to attract and retain qualified and trained faculty of high order. As the bureaucratic process of administration continues to stifle Indian academia, it will further reduce the competitive edge of Indian higher education institutions. There is, therefore, a need for institutes of higher learning, even in the public sector, to allow teaching staff more allowances, freedom to enter into consultancy arrangements and avail of attractive perks such as housing facilities in case higher salaries are not possible. In some cases collaborative efforts between Indian public institutions and foreign institutions fail as India institutions do not provide for higher salaries to foreign teachers.

16. Supply Side

- 16.1 This immense demand supply gap, the inability of most Indian student to pursue studies abroad, as well as the value accorded to foreign degrees in India has provided an attractive opportunity that many western universities and technical colleges are beginning to explore. Indian institutions are also entering into partnerships with established foreign universities and institutions to offer well structured professional courses in business management and media studies. It is observed that in anticipation of educational services coming into the fold of the GATS, well established names like Lancaster University, Purdue and Sunderland are looking towards India for new markets for their courses and programmes. Concordia Universities of Canada are also

in the process discussing collaboration possibilities with Indian Universities. While for these universities it is both an economic opportunity as well as a matter of expansion into new territories, for Indian students, it is an opportunity to earn a much prized ‘foreign’ degree at home at an affordable cost. Many students aspire to migrate to the US or the UK. For them such degrees signify the first step in that direction. Management degrees are also popularly offered by western institutions. Today, some of the degrees available in India are vocational diplomas from Western International University Fairleigh Dickenson University, and Wigan and Leigh College, IT from IIT educational services (with NIIT of India), Architectural Degrees from Clemson University, USA, Tarleton State University USA, and Coastal Carolina University-USA, in collaboration with Ansal Institute of Technology, Gurgaon. This is merely an illustrative list and certainly not exhaustive. Compared to this Singapore and the UAE have been able to attract many more better-known universities to their country.

17. Constraints on Public Funding:

- 17.1 The Indian Institute of Technology (IITs) proved that India could produce world class talent in terms of technical professionals. While Indian Doctors and other professionals have already been recognized in developed countries like the UK, USA or developing economies like UAE, Dubai and other Gulf countries, the dot.com boom proved the quality of Indian institutions of higher learning especially the IITs. The US Congress has passed a special resolution giving credit to the role of IIT alumni in USA. The UK and more recently, Singapore and the Gulf have started wooing qualified Indians in a big way for their intellect, efficiency and business-like work culture. The IITs have led the way for the establishment of an Indian meritocracy globally by providing world class technical education to a select 3 per cent of its applicants. The Indian Institute of Management (IIM) graduates in Singapore today are ranked in the same league with products of Yale and Harvard Business Schools in terms of quality. But this quality comes much cheaper than hiring

professionals from the US. Similarly, Singapore and the Gulf countries are attracting Indian Medical and other Professionals as well, much along the same lines. While the IIT model has proved to be a great success but it remains at best an island of exclusive education to the select best. The Government of India in its wisdom has decided not to open any new IITs but upgrade seven existing regional engineering colleges to the standard of IITs (*Hindustan Times*, 8 November 2005). This is in contrast to China, which is opening new institutions with and without collaboration with the leading universities of the West. It is also inviting FDI in higher education through Joint Ventures and various co-operative learning programmes. All this has led to 24per cent increase in enrolment over 2004 in postgraduate programme (*Hindustan Times*, 28 November 2005)

18 Private Initiative in Higher Education in India

- 18.1 Private sector initiatives in the business of providing education in critical disciplines of contemporary relevance have started making their presence felt. *Business Week* of August 22-29, 2005 carries a special feature on the Manipal Institute of Technology (MIT) in Karnataka, India which is a leading name among the second tier engineering institutions of India consisting of some 2,240 engineering schools. 55 per cent of them are public institutions and others privately run but not nearly as exclusive as the IITs. While IITs produce 3000 engineers annually from its 7 campuses, these second tier institutes produced 207,000 graduates in 2005 fulfilling an important need. With overwhelming demand for engineering seats and dismal record of government expansion, the private sector now accounts for 84per cent of the seats. Similar increase is taking place in medicine as well.

Box 5: The Manipal Academy

Manipal Institute of Technology founded in 1953, is a private effort, which has built for itself, a tremendous market reputation. It consists of 53 professional colleges under the umbrella of the Manipal Academy of Higher Education (MAHE). It now has a 30,000 strong student body, studying all subjects from hotel management to software development. PSG College of Engineering in Tamil Nadu and Pune Institute of Advanced Technologies are in a similar role. Companies like Motorola Inc., and EMC Corporation often recruit students from Manipal Institute. Infosys, Tata Consultancy, Wipro and Satyam Computers together employed more than 40,000 engineers in 2004. There are collaborative efforts with the industry, which provides course material, case studies as well as training to lecturers on new areas like chip design, radio frequency identification. This collaboration pays off in reducing training time from 76 days to 52 days.

The Manipal Academy by virtue of being a privately run Institution charges a higher fee. While the students at the IITs pay pittance, the Government pays \$18,500 per student for 5 years. On the other hand MIT students pay \$ 9000 tuition fees for 4 years which is ultimately a much cheaper option for the economy as a whole. *There are above 100,000 Indians in country's 975 private engineering colleges.* But Manipal Academy has been able to build a \$7.6 million innovation and research centre to attract likes of Hewlett-Packard, Philips, EMC and Infosys. The Manipal Academy will invest \$23 million in the next three years in new facilities. *However, the faculty remains underpaid and therefore, the academy is unable to attract talented teachers.*

Meanwhile, Lancaster University has entered into a collaborative degree arrangement with the Manipal Academy. This will enable students of MAHE to earn a foreign degree sitting in Manipal. MAHE has also acquired an ISO 9001:2000 Certificate for all its systems and practices, benchmarking it with the best in the world. This Deemed University has undertaken a comprehensive audit and implemented industry specific accreditations and scalability on quality management systems enhancing its brand value.

- 18.2 Pune in India, near Mumbai, is another attractive educational centre for students. Nearly 200,000 students from across India study in its educational institutes that are over a hundred in number and its nine Universities. It is rapidly developing into the educational capital of India. However, on the flip side, all this hectic activity has drawn the interest of Maharashtra's most powerful politicians to the profitable arena of 'edu-business'. There are instances of a single politician running over 140 educational institutes. All these institutes generate huge amounts of money. There are rampant cases of malpractice in the form of illegal charges to allocate seats from the management quota. These institutes have been subject to income tax raids which have revealed that seats are indeed sold for cash and a seat in the medical institute can fetch a handsome Rs 25 lakh from the candidate. The quantum of black money involved runs into thousand of millions of

Rupees. Clearly, middle class India is willing to pay for educating its children and the private institutes can fill this gap provided proper standards are maintained. (For a good debate, see Global IIT 2005 special supplement, 'The Global Indian Education 'India Today International', May 23, 2005).

- 18.3 While private efforts in India are underway, some State Governments have also got into fray of edu-business. So far the Southern States of Karnataka, Andhra Pradesh, Maharashtra and Tamil Nadu have been encouraging educational institutions in the private sector to come into their State. Lately, the Government of Haryana, adjoining Delhi, which is a major educational centre for North India, has announced setting up of an “Educational City”. Although details of the proposed Educational city have not been divulged, Canada has already offered to assist. The Canadian High Commissioner to India has announced that Canada and the State of Haryana would have mutual co-operation in areas like milk industry and environment technology. She has also suggested distance learning and exchange of faculties between the two countries. (see *Web India 123.com dt. June 26, 2005*). It has also been reported that the State Government of Haryana is proposing a Private Universities’ Bill for the State.

18.4 Government on Private Sector:

The issue of private sector initiative in education sector has been a matter of great controversy and debate in India. Of late the Government’s record in provisioning of higher education has been dismal. India is already a country of the largest body of illiterates in the world. Our tertiary education sector, which has set up institutes of excellence, has also a very poor record so far as government sector is concerned. The government has abdicated its responsibility to provide tertiary education to all those who desire and deserve. The southern states of Karnataka, Andhra Pradesh, Tamil Nadu and Kerala, however, allowed private institution to come up, especially in Engineering and Medical disciplines. According to SS Gill (Indian Express, 8 November, 2005) out of 252 engineering colleges in Tamil Nadu only 14 were run by government. In Andhra Pradesh this figure was 250 and 18. In Karnataka 125 and 1 while in Kerala 220 and 11 respectively. As a result out of 818 engineering colleges in these four southern states

only 5 per cent were run by state and the rest were unaided private institutions. It is these institutions, according to him, which spearheaded India's information revolution.

- 18.5 While these private investors have invested crores of rupees into these colleges, the government and legislature feel that they should be regulated so that they do not make profits out of these ventures. The Supreme Court had also initially taken a stand against them, but after the judgement in *Inamdar* case (2005) which gave them a free hand, the government has taken an exception and had introduced a bill to curb the activities of the private institutions with regard to fees and admission. If the Bill passes with an Act, it will lead to further deterioration in the growth of tertiary education in India as private investors will shy away from this area.
- 18.6 Kiran Karnik of NASSCOM interacting with the media persons on the sidelines of 'Information Technology, Information Technology-Enabled Services Industry-Academia Meet 2005' suggested a way out by making a case for 'Special Education Zones', where unnecessary regulations and bureaucratic constraints do not apply. Corporatized entities can function here, attracting faculty and students from around the world, with fees based on market forces but with scholarships and subsidized loans for needy students on the lines of special economic zones (see *The Hindu*, December 01, 2005).
- 18.7 **Affordability of Privately Provided Education for the Indian Middle Class:** With private unaided education providing nearly half of the higher education in the state, it has been proved that there is considerable paying capacity within the Indian middle-class presumably, because of the high value attached to higher education. Further, it may be stated that India continues to lead the world in the number of students studying abroad. India has the largest contingent of students studying in USA at 80,466 in 2003-04 (*Economic Times* 15 November 2005) and this has been a trend for many years. If the government introduces a student loan programme for deserving students at a national level with a guarantee for those unable to meet the financial surety requirements, it will give a major boost to Higher Education aspirants in the lower income groups.

18.8 There is an apprehension in the minds of many that unregulated private sector education will also invite ‘fly by night operators’ who will open bogus universities and colleges and cheat students of their money. This apprehension is well founded but should not deter from encouraging private colleges and universities. Effective surveillance and better regulation needs to be brought in and, once supply is adequate and competition to attract talented students gains pace, students too will be able to discern quality and will not be at the mercy of unscrupulous business-persons.

18.9 Stanfield College is one of the leading players in private education in Singapore. It is one of the three schools in Singapore with approval from London School of Economics to offer a Diploma course in Economics, as well as easy transfer to London University. Of late it has also announced the establishment of 20 business schools in India starting with Chennai followed by Delhi, Kolkata, Mumbai, Ahmedabad, Bangalore, Hyderabad and others with a total investment of Rs. 170 crore over the next 3 years (*Chennai Online News Services* 19 July 2004).

Despite these developments serious mismatch between specific manpower demands and supply in the sector of IT enabled services (ITes) will persist. According to the projection made by NASSCOM, the manpower requirement in ITes alone is expected to grow rapidly to about 1 million by 2007 and by 2012 India will actually face a shortage of trained manpower in the sector. The attrition rate in software is already very high and there is a great need to retain talent. Malcom Waggot, Chief Operating Officer, HSBC Global Resources, South Asia, speaking at the National Convention of Executive Recruiters Association stated that attrition costs are 1.5 times the annual salary bill. He further stated that as Indian companies grow in size, there will be higher levels of attrition leading to wage inflation and greater competition from China, South America and Philippines. India should immediately step up its production of skilled manpower in order to sustain its competitive advantage in the knowledge and BPO sectors. This is possible by only through a thorough and well calibrated ‘Higher Education Policy’.

Section V

The Way Forward

19. International Experience in Financing Higher Education:

- 19.1 There are different models for different countries where financing of higher education is concerned. In countries such as France, it is entirely a state responsibility. But in countries like the UK, it is largely a state responsibility, but universities and colleges are encouraged to raise their own funds as well. In the United States there are two parallel streams, the State Universities, which are government funded, and private universities, which are run without government funds. In countries where there is full budgetary support, as higher education becomes more and more sought after it notches up bigger bills and the budgetary fund requirement for Higher Education starts competing with budgetary demands from primary and secondary education services. While this is happening in all countries, in the US, the competition between primary and secondary schools on one hand and tertiary schools on the other is blunted to the extent that they have managed to develop other sources of financing rather successfully. The US economy also has a very large number of charitable funds, which donate to universities and colleges. They have also developed alumni funding through various 'fund raising' activities.
- 19.2 British Universities dip into a mixed bag of funds. It has been stated that in real terms public funding of universities in the UK has declined by a third since 1989. While the government may be committed to a 'knowledge economy', today it is spending even less than 1997. British Universities, whose degrees are still regarded with the greatest respect worldwide, employ the most ill paid, demoralized academic community availing of dilapidated facilities in the discharge of their duties. No British University library ranks among the top 20 worldwide. The mainstay of the British Universities today are their 270,000 foreign students (not including EU) who pay an international fee which is substantially higher than that of local students and collectively contribute \$1.8 billion a year in fees. Without

these students, many of the universities would probably go bankrupt. The market for foreign students is considered to be worth £30 billion in fees alone. Further, this market is expected to grow exponentially as incomes in developing countries increase. Within the next 15 years, the demand for seats by foreign students will treble from 2 million to about 5-8 million in 2020, with most of the demand coming from Asia. Today, Britain ranks next to the US in popularity. But after the incident of 9/11 and the visa restrictions imposed by USA thereafter, there has been a decline in the popularity of US as a destination by foreign students. UK, Australia and Singapore have been trying to take advantage of this turn of events to expand their market share in attracting more foreign students. The concept of student loan financing is gaining momentum, and it is being increasingly promoted.

19.3 The Case of USA

In one of his background paper 'Allowing the Market to Rule: The Case of the United States', Professor David D. Dill of the Department of Public Policy, University of North Carolina at Chapel Hill (Public Policy for Academic Quality Research Program, Department of Public Policy, Abernethy Hall, December 2002, www.unc.edu/ppaq) has come to the same conclusions regarding the American system of financing of education. At the outset he has stated that Universities have, of late, undergone a major transformation largely due to the technology of the internet. The net fostered cross border academic programmes both by conventional universities and internet based distance learning providers. The second reason for the change is due to steps initiated by the US Government in deregulation of higher education sector as well as adoption of market based policies designed to make universities more efficient and effective. The key question to be answered is the effect market competition will have on 'public interest'. The big fight is over whether Universities are public services or private providers. The US system is the most market oriented system in the world with the existence of a large number of privately funded colleges and universities and public universities supported by fifty states that compete nationally with private institutions for students and research funds. Further, federal policies provide research support to individuals rather than

institutions. Thus colleges and universities in the US compete with each other for students. This competition is becoming more and more aggressive. This can be best described as a set of competing organizations offering similar goods and services. Therefore, US colleges and universities form a common industry providing academic degrees, research and services to their clients who are the students. Colleges and universities compete for students, research grants/support, faculty members and also financial contribution. It has, therefore, introduced a market like structure for education services and customers are the students who look at 'prestige of the degree' and 'value for money' in their selection. This market competition also triggers greater innovation and adaptation in higher education. The common concern is whether this form of market competition between universities and colleges produces desired societal outcomes. Though the question elicits different answers the system is widely accepted worldwide in the way it operates and the US continues to remain a magnet for higher education.

- 19.4 Insofar as admission standards are concerned in the US, there are no federal and very few state standards for admission to higher education and US colleges, like elsewhere, produce educational services of different quality levels. However, modern, standardized admission testing (the SAT and ACT) had been introduced as earlier 1943-48 which brought in some commonality in admissions procedures and standards along with the introduction of National Merit Scholarship Programmes allowing for national bilateral flow of information between universities and students. Further, Tuition Reciprocity Agreements between states allowed one state's students to attend another state's public colleges at the same tuition rate that they would be charged in their home state. This led to further market integration. This has led to greater competition between colleges and leading to stratification between colleges and universities in admission test scores. The loss of monopoly power due to geographic integration encourages former monopolies to compete with each other more vigorously for students with better scores and achievements. In an effort to attract the most able students, the colleges and universities themselves start to offer subsidies to students with their own funds. Since tuition

fee is not controlled, they vary generally. Higher tuition fee is commensurate with greater education quality from increased educational inputs and increased peer efforts. This has also led to a net benefit to the student community as they now have a greater choice of colleges to which they can apply on-line (in fact, this is generally the preferred option of the college). While tuition fees have gone up, it's greater value for money due to increase in competition and more efficient administration.

19.5 Financing Students in the U.S.:

United States took the market approach to higher education. It was able to build up a stratified system of state and private colleges with an unregulated fee structure. But since colleges and universities had to seek students, they had to compete and offer attractive educational packages. For their national students they developed many schemes, two of which are notable: Pell Grant Programme and Federally Insured Student Loan Scheme.

Pell Grant is the largest federal need based aid programme for post secondary students. In 2004 President Bush requested over \$12.8 billion to fund some 5.3 million college students through the Pell Grant. Eligibility is based on a variety of income and tax information and if a student is eligible the maximum grant is \$4050 per year. There have been allegations of misrepresentation of income by students of their (or parents income) and rarely has the information been verified by the Internal Reserve Authority. Be that as it may, the grant system is good but needs to be better administered.

The second is the federally insured Student Loan Programme, which is of great advantage of the student community as it provides total access to higher education with a minimum of governmental involvement. The scheme facilitates expanded opportunities on an equal basis by assisting anyone who met the usual criteria for gaining admission into college. Unfortunately the default rates have been high-largely as a result of 'permitted defaults' by unqualified students who borrowed money to attend vocational schools which provided inadequate education and few

jobs. Be that as it may, it did provide poorer students the ability to pay for their college education. By 2003 this scheme was able to provide US\$ 103.6 billion in grants and loans. The subsidy portion in this scheme was \$22.7 billion, the remaining amount was the loan component.

- 19.6 In the UK, financing the education of local students is a matter of big debate. The government has decided to introduce 'top & up fees'. They have also decided that no student should be deprived of a university education just because he/she is unable to pay. A student loan scheme is under consideration which is different from the US scheme to the extent that the repayment of the loan will depend upon the repayment capacity of the student. The repayment will start only after the income of the student reaches a predetermined amount. If student's income never reaches that cut off amount, he will not have to repay at all. On the other hand, a student who earns well may have to pay more than what he would had he taken a normal loan.

19.7 The Case of Singapore

Singapore, a forward looking Asian city state has developed an educational hub for the region. As a result of its special emphasis on school education Singapore was ranked first internationally in school student's achievements in both science and mathematics in International Mathematics and Science Study (IMSS), a comparative of many countries in which India does not participate.

19.8 Higher Education in Singapore

Singapore, an Asian city state which has a forward looking approach and is not considered a developed country, has managed to create an educational hub for the region. As a result of its special emphasis on school education Singapore was ranked first internationally in school student's achievements in both science and mathematics in International Mathematics and Science Study (TIMSS), a comparative of many countries in which India does not participate.

In Higher Education it has established itself as a regional hub as it provides quality education at a much lower cost as compared to the US. As a result it has above 66,000 international students representing over 60 nationalities. The presence of 7000 multinational companies in Singapore offers unique industry networking and employment opportunities. Singapore runs three government universities – National University of Singapore (NUS), Nanyang Technological University (NTU) and Singapore Management University (SMU) which have developed into centres of excellence. NUS has been ranked 18th in the World Ranking devised by *Times*, London in 2004, NTU has been ranked the top university in Southeast Asia featuring amongst top 10 schools in Asia by the *Economist Intelligence* in 2004. SMU has been modelled after the famous Wharton School, University of Pennsylvania and has gained a formidable reputation worldwide for its academic excellence.

In addition to the above, 14 of the world's leading international universities including University of Chicago, Graduate School of Business and INSEAD have set up centres of excellence in education and research in Singapore.

There are also many private tertiary educational organisations (PEO), which offer excellent opportunities for university, and vocational tertiary education. In order to protect the students from the potential malpractices that private organizations might indulge in, the government of Singapore has set up a 'Care Trust' awarding an Education trust mark accreditation provided the private provider of education complies with its standards. Once a private institution acquires this Trust Mark, students are assured the students that it offers good practices in student protection.

In addition there are Singapore Quality Clan (SQC) benchmarks which certify PEOs in business and organisational excellence.

PEOs in Singapore offer a range of diplomas, certificates and degrees even at the postgraduate level. Many of them are in partnership with Universities from USA, UK and Australia. Overseas Universities confer degrees and certificates, thereby giving the opportunity to students to obtain qualifications from foreign universities while studying in Singapore. University of South Wales of Australia has opened a campus in Singapore – this is the first foreign private university to open a campus and offer a comprehensive range of undergraduate and postgraduate research programmes. Many other foreign universities have created their presence in Singapore in innovative and cost effective ways. For instance

- (a) INSEAD, the European MBA school has set up a full campus in Singapore by investing \$66 million in a faculty at the science
- (b) John Hopkins University offers in collaboration with NUS postgraduate programmes and clinical research opportunities
- (c) Peabody Institute and NUS offer Bachelor of Music degree
- (d) MIT in collaboration with Singapore offers dual degrees, either a Master from MIT or NUS/NTU.
- (e) Wharton Business School of the University of Pennsylvania and SMU collaborate in curriculum development, research and executive business programme.
- (f) Georgia Institute of Technology, USA and NUS offer postgraduate and executive programme and logistic and supply chain management.
- (g) Stanford and NTU offer a postgraduate programme in Environment Engineering as well as research opportunities.

19.9 The University of South Wales from Australia will be the first to open a campus in 2007 backed by a loan of £33 million from Singapore's Economic Development Board and a £48 million from Australian Government loans. Singapore's aims to create a Warwick in Asia, a research led university with a strong scientific basis. Singapore has also invited India's IITs to open a branch there. Further, in order to

attract Indian students, it has recognised educational degrees from 129 UGC approved Universities in India.

- 19.10 Singapore and Trans-national Education: Singapore's strategy is to create a knowledge based society—in doing so, it wants to create an 'Education Hub' for attracting students from nearby countries like India and China. Singapore's strategy is piggy-back on well known universities of the world. While the government run universities are providing conventional degree courses as envisaged, one of the first private institutions called the Singapore Institute of Management (SIM) has emerged as one of the largest players in the Trans-national education market. In 2003 SIM offered 62 programmes with foreign universities. These Universities include well-known names such as University of London (external programme), Beijing University, RMIT University in Australia and George Washington University in the US. SIM has also taken a grand initiative in distance learning by running the Open University in collaboration with UK Open University. There are a number of private colleges and companies partnering with foreign universities to offer degrees in Singapore.

19.11 Higher Education in Australia

Higher education consists of both university education and vocational training. Vocation Education and Training (VET) forms a very important part of higher education in any country as it provides the skilled labour input to the economy. In Australia the integration of higher education and vocational education and training is now complete.

The Australian higher education system consists of 39 public and 4 private universities with a large number of campuses while vocational institutes consist of 87 public and 4432 private providers. The Government spends nearly \$ 6 billion on the public universities and A\$ 3-5 in public vocation training college ('Varieties

of Learning: An Interface between Higher Education and Training, Commonwealth Department of Education Science and Training, August 2002).

Over time there has been in Australia, an increasing movement of students between vocational education and training and higher education. While there is still no national system of credit transfer between VET and higher education, considerable progress has been made in setting up appropriate systems. Australian Vice-Chancellors Committee and Australian National Training Authority (ANTA) have developed with 35 participating universities a credit transfer arrangement for holders of TAFE qualifications in 13 broad fields of study.

The Government of Australia has taken a proactive approach in inviting foreign students to study in Australia. This has been done to create an educational hub in Australia as it is a cheaper location than US or UK.

19.12 *Higher Education in China:* Recently, China has also started attracting foreign students. Indian students are being drawn to Chinese Medical Schools. Hubei University receiving 100 medical students from India. The University has set up a special international students hostel with an Indian food corner and English language library for this purpose.

19.13 *The UA Case:* The United States, in this race, is not lagging behind. Many top US Universities have opened campuses abroad. Cornell University recently opened a branch of its medical school in Doha, Qatar. University of Chicago is also setting up shop abroad, especially for executive MBAs in Spain and Singapore. Harvard University opens its summer schools, offering over 200 courses simultaneously in humanities, computer sciences, sciences, including premedical, a dozen foreign languages, etc. in Bolivia, Brazil, China, Czech Republic, England, Germany, Greece, Italy, Portugal and Spain besides having a full summer school in their own campus in Cambridge, US.

19.14 Another new concept that has gained popularity is based on acquisitions. Baltimore based Sylvan Learning Systems Inc. has through acquisitions, built up a network of eight universities serving 101,000 students in nine countries in Latin America, Europe and India. In Chile, it has had spectacular success where it has quadrupled enrolment to 20,000 by opening several campuses. According to Career College Association, over 40,000 students attend American for-profit colleges in some 20 countries and a thousand more go for US colleges in overseas sites.

19.15 Creating Education Hubs

According to Rosemary Righter, a distinguished journalist, Britain should take advantage of the market conditions and create an environment to meet the unsatisfied demand from China, South East Asia, and India. There are two further suggestions given by her in this respect:

- Britain leads an Open University proactive approach to distance education. This can be extended through validation and franchise arrangements and in partnership with universities overseas.
- Export a complete British University education by building and staffing a British University campus overseas to a location that is both conducive and cheaper to run.

19.16 In this context, Dubai has set up a 'Knowledge Village' after 11 September 2001 for wealthy Gulf students no longer interested in heading to the US. It has already attracted 15 foreign universities and business schools to set up campuses. It provides a host of facilities and excellent infrastructure.

Section VI

20. The Challenge

- 20.1 The Government's dilemma is well known. On one hand India has a huge population of uneducated children and the Constitution provides for free and compulsory education upto the age of 14. On the other hand, the growth of the knowledge sector along with BPO is sending a new signal to the economy. The experiment of India in developing its institutions of higher learning has paid off. While growth in South East Asia, starting with Japan, then the Asian Tigers and now China, is export led in nature with cheap manufacturing products leading the fray.
- 20.2 India's present growth is led by service sector, which has had a boost due to the ICT revolution. However, this is a skill-intensive sector and India is now moving up the value chain, which calls for greater R&D efforts and requires knowledge workers as opposed to manual workers. A new strategy for meeting this challenge needs to be evolved with complete policy commitment on the part of the government. The knowledge sector boom unfortunately, can only reach the initial benefit to the educated, who are generally better off and, therefore, does not impact on the poor directly. The manual labourer who can qualify for a factory job is excluded from this growth process.
- 20.3 This new window of service sector export led growth in India is not an opportunity that can be frittered away. Similar to export of manufacturing, which requires an infrastructure of roads, electricity and dedicated manual labour, service sector export requires a steady supply of highly skilled manpower which can only be supported by a robust Higher Education System along with an internet infrastructure that is both deep as well as broad. Seen from this perspective, the business of providing appropriate higher education opportunities is not just the concern of the Ministry of Education, but all other ministries with operations in related areas such as, the Ministries of Commerce, IT, Communications, Health, Science & Technology, Finance etc. While it is clear that without this kind of holistic approach to education provisioning it will be

impossible to fulfil our aspirations to lead the world economy in knowledge services, straddling across the functional areas of different ministries is difficult if not nearly impossible to administer without some kind of creative out-of-the-box thinking. Further, Higher Education provisioning is a fairly capital intensive process. It is generally accepted that Higher Education contributes more to individual career building rather than wider public good. Though this is a narrow short term view of the issue in the present context of the global economy, nevertheless it is still the prevailing policy sentiment. Since we have hit upon the knowledge sector boom without completing our basic homework, India still has a yawning gap in primary and secondary education access to the masses. The ignominious medal for the largest absolute number of illiterates in the world hangs heavily round our national neck. So the urgent and competing demand on public educational resources from primary, secondary sectors is great. In the light of these circumstances, private funding of Higher Education is not only possible but desirable. There is a need for the government to accept this in spirit, letter and practice. Further, loan programmes need to be devised for students who may not be able to provide security collateral so that no deserving student is left out because of poor parental resources.

- 20.4 There is little doubt that the WTO & GATS agreement can only be to India's advantage as our knowledge sector will get a boost. The 'Trojan Horse Principle', as enunciated by Prof. Bhagwati, has in fact already become a thing of the past. What we need now is to take on the global knowledge sector challenge head on right here from the Indian soil. Therefore, as a policy decision, appropriate Higher Education and skill development should be considered a strategic decision of economic importance – and it should be incumbent upon all Ministries to come up with their strategy for Higher Education to meet the challenge of the knowledge sector led growth. Whether it is Textiles, Mines, or Defence, R&D in each sector needs to be state of the Art so that not only can our own research institutes flourish, but can induce multi-nationals to set up their R&D facilities in India, recruiting appropriately skilled Indian manpower.

This brings us to the issue of Regulations. **Who regulates Higher Education in India?** There are basically two agencies in India regulating Higher Education – University Grants Commission (UGC) (1956) and All India Council for Technical Education (AICTE) (1987). Both these institutions are under the Ministry of Education, which holds them in a vice-like grip. The general tendency of both these institutions is to make the process of accreditation a strenuous bureaucratic exercise. Of course, quality assurance in Higher Education is one of their main tasks but making recognition and accreditation a tedious process is surely not the only way to ensure quality. While the bogus or poor quality colleges are a matter of concern for every regulator, the problem in India is that University Authorities do not have a proper monitoring and surveillance system for colleges. This leads to episodes of sudden derecognition as in the case of Chattisgarh University and a large number of affiliated colleges which was very distressing for a large number of students. Recently, the Government and Chancellor of Chaudhury Charan Singh University have cancelled the affiliation of twenty-two B.Ed colleges and ordered an inquiry into 150 others affiliated to it. Such knee jerk reaction is a symptom of a poor quality monitoring system of the University Authority (*Hindustan Times*. 27 October 2005).

The Constitutional amendment of 1976 places all higher education, including technical education, in the concurrent list of the Government of India and States for promotion, co-ordination, determination and maintenance of. During the last 50 years, the Government has also established and supported a large number of high level institutions, Central Universities as well as provided aid to Universities set up by State Governments. Departments of Education, UGC, AKTE have provisions in their budgets along with other Ministries like Health, Agriculture, Science & Technology, Electronics, Space, Bio-technology, Environmental Science and Industrial Research/Atomic Energy to directly fund research and training. There has been a Scientific Policy Resolution passed by the Parliament in 1958 promoting the study of science. A National Policy of Education was adopted by the Parliament in 1986 and modified in 1992.

- 20.5 While these policies speak of the good intentions of the Government, it has been generally noticed that they get rapidly enmeshed in deep bureaucracy of each of these institutions or sometimes get unnecessarily caught up in politics. The CAG in its report of 2002 has made a scathing attack on UGC. It has accused UGC of hardly using its supervisory power of inspection leading to poor quality. The 2005 Supreme Court Judgement ordered closure of over 100 universities and institutions as a reflection of poor quality control by Government institutions.
- 20.6 The Technology Information Forecasting & Assessment Council (TIFAC), a Government registered body under the Department of Science & Technology, released 25 detailed reports on ‘‘Technology Vision for India 2020’’ in August 1996. Sixteen key sectors of the economy have been identified for policy attention. It is aimed that India will become a global leader in the Service Sector with its vast and skilled manpower reserve.
- 20.7 While we realise the importance of financing Higher Education at this critical juncture of Indian economy, we need to consider the macro financial issues of the Indian government. With a budget deficit of 6% and a huge demand in primary and secondary education sector, there will be a dearth of funds for the tertiary sector. Under these circumstances there is a great need for financial innovation for this sector. It is all but clear that we need to change our policies and regulations to allow other forms of funding and usher in complementarity between private and public higher education institutions. Before we examine international cases, it is better to look at the wider picture. The World Bank has made an interesting analysis according to which higher education is generally heavily dependent upon government funding leading to fiscal adjustment problems in developing countries (see '*Development in Practice-Higher Education: Lessons of Experience*' May 1994, World Bank, Washington, D.C.)

With increasing enrolment in higher education, there has been a dramatic compression of per student expenditure since late 1970s as higher education has been the fastest

growing segment, thereby leading to quality deterioration with low women enrolment and lower staff-student ratio.

21 The Issues

- 21.1 In a document called 'Challenge Education' produced in 1985 by the Ministry of Education, the government admitted that the 'whole process of higher education has become warped'. Indeed higher education in India is faced with deteriorating conditions 'resulting from expansion and worsened by affiliation system and shrinking resources'. Also despite numerous committees having produced reports to this effect nothing significant seems to have come out of it. Meanwhile, there are over 200 Universities and 8000 colleges and 7 million students, 27,000 teachers in Higher Education in India. While educators opine that the Government should not abandon its responsibility of liberal funding of higher education and creation of funds through donations and upward revision of fee structure is now a must. In fact, the actual percentage of fees to operating cost in India has declined due to increasing cost of education and reluctance of authorities to increase fees or even raise funds from other sources. This is a critical issue facing the Higher Education System in India and the politics of Education. Public expenditure on higher education is barely 0.4 per cent of the GNP while it is 4 per cent for the entire Education Sector.
- 21.2 Regular University-Industry interaction, which is critical to raising funds from corporate sources as well as restructuring the curriculum in tandem with the changing needs of the industry is missing in India. Vocational higher education in India is an area that merits further research. In this connection in 1994-95, UGC launched a scheme of Vocationalization of Education based on recommendations of T.N. Dhar Committee (1993). UGC has also taken the initiative to form the National Assessment & Accreditation council (NAAC) in September 1994 for purposes of grading institutions of higher education and their programmes. This is a laudable step.

22. Towards Privatization of Higher Education in India

- 22.1 The 1990s saw major developments and turn of events in higher education in India. According to Jandhyala B.G. Tilak of National Institute of Educational Planning and Administration (see Privatisation of Higher Education in India, 2002) public funding for higher education should be drastically reduced. In 1997, the Government of India in its proposals for subsidies accorded higher education the status of a 'non-merit good' for the first time while elementary education remained 'merit-good'. The Ministry of Finance reclassified higher education into "merit 2 good", which need not be subsidized by the State at the same level as merit good.
- 22.2 In two conflicting judgements of the Supreme Court, the issue of 'Capitation Fee Colleges' was also sorted out. In 1992, the Supreme Court practically banned high fees charging private colleges stating that capitation fee is "potentially unreasonably unfair and unjust". But in 1993, it reversed its judgement under the name of self-financing colleges. Thereafter, elaborate mechanisms were developed by the Government that helped in proliferation of self-financing capitation fee colleges in the country. Today, such colleges, especially in engineering and management outnumber public institutions several times over, especially in the Southern States of Andhra Pradesh and Karnataka. Some people feel that such reckless growth of colleges has led to deterioration in quality. A Private University Bill was introduced in the Rajya Sabha (Upper House) of the Parliament in August 1995 with a view to providing for the establishment of self-financing universities. The bill has not been passed so far. The bill provides for a private university permanent endowment of Rs.30 crores and full scholarship to 30 per cent of the students. This was kept because in earlier cases many private colleges had to be bailed out by the Government. The Prime Minister's Council on Trade & Industry also constituted a Two Member Committee on Higher Education, of two leading industrialists of India – Mr. Kumarmangalam Birla and Mr. Mukesh Ambani. This Committee in its report strongly suggested that the Government should leave higher education to the private sector largely and confine itself to elementary and secondary education. Further, it wanted the principle of 'user-pays' and loans and grants to be provided to the economically backward. It projected that by

2015 we will need to double the number of colleges in India, which will require an investment of Rs. 11,000 crore.

- 22.3 The trend in India is clear. We need to improve our Tertiary Education System but public funds are in short supply. Under the Millennium Development Goals India is committed to providing universal primary education by 2007. This is a gigantic task which requires huge resources. It would, therefore, not be possible for government to go for a substantial increase in budgetary funds for higher education. Private Sector funding is available and FDI in education is also possible. We need to consider these options very seriously and study international experiences and models to draw learning for the Indian case. In addition we need to develop a system of student loan financing as well as fiscal tax exemption/credits in case of loans. In Singapore, China and the Gulf where private institutions have been allowed, the higher education sector is flourishing.
- 22.4 While the Private Universities Bill has not been passed, a few private institutions of higher education have been given virtual university status by being recognised as 'Deemed Universities'. A few universities like Guru Gobind Singh Indraprastha University in Delhi have been created consisting of only affiliated private self-financing colleges. A few private institutions like International Business Schools and Indian Institute of Information Technology are allowed to operate virtually as Universities.
- 22.5 **Private Professional Education Institutions (Regulation of Admission & Fixation of Fee) Bill, 2005**
- 22.6 There has been a general trend towards liberalisation and opening of education sector to private initiative as described earlier specially in the southern states of Karnataka, Andhra Pradesh and Tamil Nadu, as a result of unanimous judgement of a seven judge bench of the Supreme Court. However, following the Inamdar vs. State of Maharashtra judgement, the Ministry of Education has taken a perverse view and introduced a

regressive bill called ‘The Private Professional Education Institutions (Regulation of Admission & Fixation of Fee) Bill, 2005’.

Box 6: The Private Professional Education Institution (Regulation of Admission & Fixation of Fee) Bill 2005.

The bill applies to deemed universities and private aided or unaided professional educational institutions affiliated to a university. Further, it defines a ‘Foreign Education Provider’ as a university or an Institution duly accredited and established under a foreign law and notified as an institution deemed to be a university by Central Government. No foreign institution, which is not a Foreign Education provider can admit or charge fee for a professional course.

The Bill controls the Admission structure of both aided and unaided professional educational institutions dividing the total enrolment into the Management Category & General Category. Out of the total enrolment, it fixes percentage quota in each case for aided and unaided institutions. For Deemed Universities it prescribes a Common Entrance Test on an All India basis for a fair and transparent selection process.

Foreign Education Providers will need to seek a status of a Deemed University before they can start operating in India and no foreign institution which is not categorized as a Foreign Education Provider can operate in India.

The Bill is fairly draconian in nature and will probably ring the death knell for private education in India if it is passed, as it will choke it with its control over admission and fees. On the one hand, it provides for no time limit on the processing of the application of the foreign institutions seeking deemed university status but allows only 30 days as cut off period for lodging an appeal. Infact, what is needed in India now is an Association of Private, non-aided Higher Education Providers as a lobby to educate the public as well as the legislator to the need for a deregulated Higher Education System. In any case, the private Higher Education system constitutes more than 50 per cent of the Higher Education sector What is required is not restriction but more growth so that with competition, quality will automatically improve. A Rating Agency, which could provide a standard procedure for ranking of institutions of higher learning based on predetermined criteria could increase instil students with greater confidence in their choices.

What if this Bill is passed and becomes an Act? It is fairly clear that this Bill will be a retrograde bill with government controlling both admission and fees in the guise that all private operators are crooks and cheats. As a result, all genuine and good private non-aided institutions and Foreign Education Providers as well as Foreign Institutions will shy away from India. As educational hubs emerge in Singapore, Dubai, and China, India will slowly lose its competitive edge.

Section VII

23. Recommendations:

The road ahead for India is directly linked to creation of quality Higher Education Institutions in a big way to meet the challenge of the knowledge Hub, which India is fast becoming.

- The Government resources for higher education are simply not enough. Government supervision of higher education is dismal, to say the least.
- Recourse to quality private higher education, both university and non-university is essential.
- India needs to have a proactive demand based policy towards private higher education including foreign institutions/universities desirous of setting up campus in India or entering into joint-ventures. India could offer tax concessions/fiscal incentives for setting up campuses.
- The issue of raising the fees upwards to meet the cost of education is critical if we are to maintain and sustain the quality of our government and aided institutions as private institutions are already using a higher fee structure. In a competitive setting there is no reason why the fees should not meet a reasonable proportion of the cost of education. A figure of 20 per cent of recurring cost is considered reasonable in the international scale, although in some countries (a la South Korea) it could go up to 40 per cent.
- The need for financing of higher education for students, especially those coming from low income households needs special attention. Like in the United States, we may also evolve a guarantee system, where students coming from low income households are eligible for a student loan without parental security or guarantee so that there is no discrimination due to the financial background

of the student. Subsidization of the interest rate for students should be based on his and his family income. For this innovative financial mechanism needs to be evolved incorporating some of the salient features of the systems existing in UK, USA.

- Broad-band services and provision of computers is an essential requirement of higher education. A Committee for this purpose needs to be constituted to look into providing broad band connectivity to all students along with low priced computer accessibility.
- Open Universities need to be encouraged to offer quality programmes at the least cost. This becomes the most cost-effective way of providing higher education, including technical and vocation education.
- In view of the expanding role of WTO, higher education would soon become an item under it. We should encourage foreign universities to come to India to set up independent operations or collaborate with existing Indian Institutions, colleges/institutes. There is no need for government approvals in FDI in education.
- While a regulatory set up is required to ensure that there is no cheating or hoax, fixation of fees should not be in state control. On the issue of admissions, private player may be given the discretion for admission, but will have to justify merit. Perhaps a Tribunal on Admission Disputes can be set up for those aggrieved by the admission policy of an institution.
- It is also important that a lobby or association of non-aided private colleges be organised, which could then articulate the needs and demands of such institutions and provide a platform to counter the tendency of the bureaucracy to dominate its workings. It could create appropriate pressure for the dropping of the bill in private professional education in its present form.

Appendix

Task Force on Meeting Human Resource Challenge in IT & IT enabled service (ITES), Report and Recommendations, Government of India, Department of Information Technology

In a report published in December 2003 by the Ministry of Communication and Information Technology, some interesting facts and figures were revealed. Some of the main features were:

1. Indian IT & ITes were expected to generate export business of US\$ 13 billion. The industry now creates wealth of US \$ 16 billion per annum compared to US \$ 5 billion five or six years ago. India's share as a service provider to the world is over 24 per cent of the offshore service markets.

Manpower requirement

Demographic studies showed that by 2020 India could be one of the few countries with surplus of personnel within the employable age group. However, there is a possibility of shortage in terms of skilled personnel for IT and ITES even by 2009.

Strategy recommended by the Report

1. Interaction with industry and academia to home in on the exact nature of training and skill building required.
2. To inculcate the right skills and establish standards to certify quality of skills.
3. For formal education the initiatives suggested are :

Upgrade Regional Engineering Colleges to National Institutes of Technology

- Set up Indian Institute of Information Technology (Design and Manufacturing) at Jabalpur and Kanchipuram.
- The service providers in the private sector to work with the State Governments to enhance quality of technical education.
- Launch umbrella programmes for quality improvement in technical education,

It was also stated that IT enabled services require a much broader range of skills and a lot of these are not available through the formal and non-formal system.

The main recommendation, however, is for a Common Certification System for some standard skills. This could also save 50 per cent of recruitment and training costs (and time). A common agency that is industry approved and government recognized can handle testing and certification at a national scale.

Based on a historic patent filing, it is stated that India's R&D efforts have been prolific in some key areas including IT and Electronics, Pharmaceuticals and Biotechnology, Engineering and Design. India has great scope in the health-care, bio-technology, e-governance, e-services and core IT research and development.

But all said and done, India's ability to emerge as a hub for R&D will depend upon the adequate availability of high skilled human resources, which in turn requires changes in the education system as well as infrastructure and faculty requirement. Specialized institutions at higher level (e.g. Post Graduate/PS Diploma) could focus on providing domain expertise in global practices and systems.

Transition from BPO (Business Process Outsourcing) to KPO (Knowledge Process Outsourcing) is a major step for India. According to report prepared by the Confederation of Indian Industry (CII) 'India and the New Knowledge economy'

it states that India could emerge as a destination for KPO. It also stated that the KPO industry will grow at 46 per cent to reach US\$ 17 billion by 2010. It makes a specific mention of healthcare and biotech growth.

In this connection a mention needs to be made of DOEACC Society, an autonomous body under the Department of Information Technology, Ministry of Communication & Information Technology. The objective of the society is to develop qualified manpower in IT by utilizing the expertise available with the non-formal computer training institutes (see *Business World*, 31 October 2005, page 24). This society was formed in 1994 with eminent academia from IITs, universities and professionals from industry. It is implementing a joint scheme of AICTE (All India Council for Technical Education) and Department of Information Technology. The activities of the society include Accreditation Schemes, short term training programmes, long term AICTE approved courses like ME/M.Tech in embedded systems. They will also have a three-year diploma (AICTE approved) in Electronics Production and Maintenance, Electronic Engineering and Computer Science & Engineering.

In this way Department of Information Technology is making its contribution to the development of required skills. However, what is required is a comprehensive strategy for manpower development that will pan across all other ministries with stakes in the knowledge sector BPO such as the Ministry of Health, Finance, Chemicals, Tourism, Aviation etc. rather than leaving it to the Ministry of Human Resource Development.

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