Offering Higher Education in India

Opportunities in Training and Research

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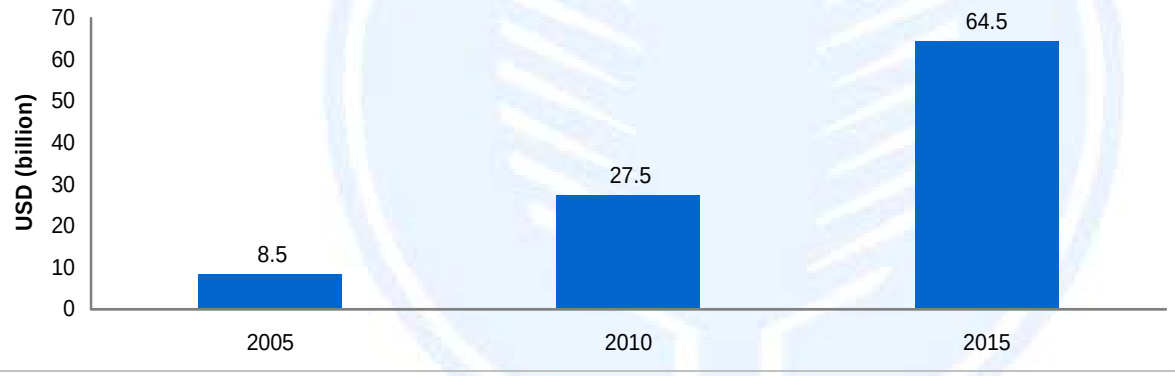
Higher Education & Research in India: An Untapped Opportunity

Demand for Research Professionals

Industry-led R&D is witnessing a rapid growth in India. Over 200 MNCs have initiated their research and development (R&D) operations in an array of domains including IT/telecom, biotechnology, pharmaceuticals, chemicals and consumer goods. Public-private partnerships have seen a growth with both industry and academic/research institutions benefiting from the process. Several MNCs are currently meeting their requirement of R&D professionals by hiring expatriates for senior positions and training qualified engineers/science graduates from India for entry-level positions. However, in the next five to ten years, the lack of suitably qualified and trained technical professionals could be an impediment to the growth of the R&D industry. In this article, Evalueserve explores the demand of research professionals in the Indian R&D industry over the next ten years. Evalueserve believes that there is a huge opportunity for international technical universities and research institutes to assist India in meeting the demand for trained R&D professionals. Evalueserve also provides an overview of some possible business models that international universities could consider for establishing their presence in India.

The Indian R&D industry was valued at USD 8.5 billion in 2005, representing around 1.16 percent of India's GDP. Evalueserve estimates that the Indian R&D industry will register a CAGR of 26 percent to reach USD 27.5 billion in 2010. Similarly, the R&D spend is expected to grow at a CAGR of 19 percent during 2011-15 to reach USD 64.5 billion in 2015. As a result, the contribution of R&D as a percentage of GDP is expected to grow to around 2.0 percent by 2010 and 2.6 percent by 2015.

Figure 1: Growth of Indian R&D Industry



Source: Evalueserve

Evalueserve estimates that the Indian R&D industry would need 560,000 professionals in 2010 and 860,000 professionals in 2015 to meet this huge demand.

Employment Opportunity in Indian R&D Industry

	2005	2010	2015
PhDs Required	27,000	56,000	86,000
Post-Graduates Required	80,000	168,000	258,000
Graduates Required	159,000	336,000	516,000
Total Researchers Required	266,000	560,000	860,000

Source: Evalueserve

This translates into an additional requirement of approximately 294,000 researchers during 2006-10 and another 300,000 researchers over 2011-15. The Government of India is ramping up its higher educational infrastructure by opening new institutions/universities and expanding the existing infrastructure and teaching faculty in the institutions. Thus, there exists excellent opportunity for foreign institutions/universities to set up their training and research institutes in India.

Innovation Clusters in India

Location	MNCs	Research Labs	Academic Institutes
Bangalore	GE, TI, GM, Akzo Nobel, Intel, Delphi, Daimler Chrysler, Philips, LG Electronics, Hewlett Packard	CMMACS, NAL, CAIR, NCST	IISc, Ramaiah Institute of Technology
Delhi	Adobe Systems, AVL, Eli Lilly, Ericsson, Honda	CBT, CRRI, NISTADS, NPL, CDOT, NIC, SERC-G, TERI	IIT Delhi, Delhi College of Engg., NSIT. AIIMS
Mumbai	Bayer AG, Clariant, Colgate, Palmolive, Johnson and Johnson, Pfizer, Siemens, Roche	NCST, BARC, TIFR, Haffkine Institute	IIT Bombay, Mumbai University, GMC, UDCT, VJTI
Hyderabad	Microsoft, Oracle	CCMB, IICT, NGRI, ECIL, ICRISAT	IIIT Hyderabad
Pune	Cummins, Whirlpool	NCL, CDAC, TRDDC	Bharati Vidya-Peeth, COEP

Source: Evalueserve Analysis of Published Data

Business Model for International Universities

Offer Higher Education

The high growth in the services industry coupled with the increased participation of the private sector in education has resulted in the demand for specialised courses and training in India. Given the growth projections of the Indian services industry, the country is likely to witness tremendous activity in the higher education sector in the next five to ten years.

In a developing country with a population of more than one billion people, the pressure to seek employment is very high. To gain a strong foothold in this competitive world, graduates aspire for a master's degree at an early age. The trend is further accentuated by an inclination towards courses in science or technology, which offer better employment opportunities. However, in the current scenario, the options available to an aspiring Indian student are limited by the lack of requisite infrastructure in higher education. Therefore, a large section of the students spend exorbitant sums to enroll themselves into private Indian institutes and foreign universities. As a society, which lays a lot of emphasis on education and distinction, parents are more than willing to make the additional investment for their child's future. A student could pay up to USD 10,000 per year for a post graduate course in an Indian private institute and around USD 30,000 per year for education in a foreign university. Earlier, these courses were restricted to the rich and scholarship holders. However, student loans have revolutionised the higher education system in India. The increased access to soft educational loans has made expensive higher education accessible to a larger section of the society.

Representation of Indian Students going Abroad, 2005

Country	No. of Students
United States	80,000
Australia	20,000
United Kingdom	15,000

Source : The Week, Sep 11, 2005

Moreover, as a general practice, the market generally rewards professionals with an advanced degree. The degrees open attractive opportunities for students, not only in India, but also overseas. With the option of paying out the loan later, students do not mind paying higher tuition fees. For example, The Indian School of Business (ISB), Hyderabad, has a tie-up with the Kellogg School of Management, the Wharton School, Pennsylvania and the London School of Business and charges more than USD 30,000 for a one-year MBA course. The school attracts about 500 students annually and the placement salaries go as high as USD 66,000 per annum for a local offer and USD 233,800 per annum for an overseas placement.

Given this scenario, international universities could play a significant role in expanding access to high quality, higher education in the country. Students would prefer to enroll into a foreign university, which offers an international exposure through faculty and student exchange programmes, at an Indian campus. In this case, a foreign university in India would offer the best of both worlds – high quality education at low cost.

From the university perspective, it can create a sustainable business model through larger enrollments at a lower fee structure. International universities can enter the Indian market, either through a collaboration with an Indian institute or on a stand-alone basis. Some examples of foreign partnerships in education in India are:

- Staffordshire University has partnered with Jadavpur University and the University of Madras to offer masters degrees, primarily in engineering courses.
- The Indian Institute of Science (IISc), Bangalore and Cardiff University, Wales, UK, have partnered to co-operate in training and research in the fields of science and technology. The collaboration also includes exchange programmes for scientists and students and sharing of information related to joint research projects.
- The Maastricht Economic Research Institute on Innovation and Technology (MERIT) at the University of Maastricht, Netherlands, has tied up with the Centre for Development of Advanced Computing (C-DAC), Mumbai, in July 2006, to start a two-year project termed FLOSSWORLD, supported by the European Union (EU) in the area of open source software. The project has already been implemented in several countries.

Conduct International Research Projects

The Indian arm of the university can also conduct research on international projects in close association with the parent university. The cost of conducting research in India is much lower than that in developed countries. The differential could be as high as 30-40 percent. For example, the salary of a chip designer with a Master's degree and five years' experience is about USD 7,000 a month in the US, whereas in India, the salary for a similar profile would be about USD 1,500 a month. Similarly, the annual cost incurred for a senior engineer in the US is about USD 150,000-200,000, while in India an equivalent would cost around USD 30,000-40,000. On other related costs, such as infrastructure, construction, etc., India again scores far better. Moreover, Indians work for longer hours as compared to their Western counterparts. Therefore, India creates a much higher value per dollar that is spent on R&D.

Research partnerships between universities and private sector in India

- IIT Kharagpur: undertakes research in collaboration with MNCs, such as, Motorola, Compaq, Oracle and GE Caps.
- IIT Chennai and Hewlett Packard (HP) run a joint laboratory at IIT's campus. This lab develops technologies for emerging economies.
- HP Labs also partners with IISc Bangalore, BITS Pilani and the National Institute of Design, Ahmedabad.
- Intel has formed alliances with the IITs, IISc and IIIT-B to conduct Curriculum Development Workshops for the faculty of engineering colleges, which helps to bridge the gap between academia and industry.
- Intel promotes R&D activities based on its design, through its Intel Technology Laboratories (ITL) at IIT Mumbai, Chennai and Delhi; IISc Bangalore; and the National Center for Software Technology (NCST), Mumbai.
- General Motors (GM) has tied up with 21 institutes, including the IITs and IISc. It conducts research with IISc on fuel alternatives and light-weight engine materials.
- IBM collaborates with the IITs, C-DAC Pune, IIITs, and IISc Bangalore.
- Texas Instruments has set up its Digital Signal Processing (DSP) laboratory at IISc Bangalore and five IITs.
- Samsung undertakes designing of colour televisions, washing machines and air conditioners in collaboration with IIT Delhi's Industrial Design Department. It also has a Consumer Laboratory at IIT Delhi that undertakes usability studies.
- Hindustan Lever Limited collaborates with the IITs, IISc and the University of Mumbai's Department of Chemical Technology (UDCT).

"Indian engineers are comparable to the best in the world, including the US and Europe, and we will use this strength to leverage our position in the world market."

– Phillippe Joubert, Executive Vice President, Alstom

In addition, the university can staff students and interns in live research projects. This would not only add tremendous value to the students, but also enrich the training and increase their job opportunities.

Conduct Research for Local Industry

The university can also offer consulting/advisory services and training programmes to local private and public entities. Some examples of partnerships between universities and the private sector are:

- IBM has partnered with IIT Bombay for collaborative research on technology; Intel has partnered with IIT Madras for research on speech technology; Wipro has partnered with Wollongong University, Australia in the area of education and research in IT services.
- Bharti, the largest mobile service provider in India, has partnered with IIT Delhi to establish the Bharti School of Telecommunication Technology and Management for technical research and education.
- On the other hand, Pramati Technologies, a developer in Java 2 Enterprise Edition (J2EE) application server technology based in India, has partnered with leading global institutions, such as MIT Massachusetts, University of Muenster Germany, IIIT Bangalore, XLRI Jamshedpur, National Chiao Tung University Taiwan, and Tsinghua University China to introduce courses in Java technology.

"The research & development work carried out in India is of world-class standards and is now attracting German biotech companies who are keen on setting up joint ventures (JVs) and R&D facilities."

– H. Richter, German Ambassador to India

Incubate Technology Start-ups

Incubation parks within university campuses are quite common in developed countries. These parks help research professionals in commercialising their ideas and innovations. The university can provide the necessary IP, infrastructure, advisory and technology support to these business start-ups. The financial resources can be provided by the venture capital community, which supports such innovation parks backed by universities. As Indians show a strong inclination towards entrepreneurship, the technology-based business incubation model is likely to be quite successful in India.

"Not only are there brilliant engineers here [in India], I've been seeing that the entrepreneurial spirit of the businesses is second to none."

– Mike S. Zafirovski, President and Chief Operating Officer, Motorola Inc.

Indian Institute of Information Technology (IIIT), Bangalore, is amongst the leading institutions encouraging a technology-based business incubation ecosystem. The incubation park is based on the Stanford University-Silicon Valley model to encourage entrepreneurship amongst students. In the recent past, two companies, namely 'Backend Bangalore' and 'BedrocQ' have been developed by the park.

Conduct Social Research

The government encourages R&D in domains, such as agriculture, space, defence, healthcare, alternate energy, pollution-control and calamity-control (earthquakes, Tsunami, etc.). A few Indian universities specialise in carrying out research in some of these fields. International universities can collaborate with these universities to conduct joint research and share best practices.

A glimpse of research in social sectors

Research Programme	Description
Malaria Research	Research towards development of a vaccine for the disease
Salinity Resistance Rice	One-third of India's rice crop and nearly 9 million hectares of cultivable land is affected by salinity. An FAO study shows that 15% of agricultural land globally will turn saline by 2025
Advanced biomass gasification	Research on advanced biomass gasification for technological advancement by power generation from biomass (a joint R&D project by IISc Bangalore , IIT Chennai, IICT Hyderabad and BHEL Tiruchirapalli)

Source : Evalueserve Analysis of Internet News Flow, Outlook

A tale of two countries – Indo-EU joint academic and research programmes

Going forward, the public-private partnership in education and research needs to be strengthened as both have an important role to play in building the system. A cross-border partnership at a macro level creates a lasting impact on the society. It creates a platform for creation of jobs, cross-border employment, cross-pollination of cultures, technology transfer, sharing of best practices, bi-lateral relations, to name a few. Countries, such as the US, UK, Switzerland and India have made successful attempts in this direction. For example,

The Department of Science & Technology (DST), India and the Swiss National Science Foundation (SNSF) have partnered together with the aim of linking together research groups from Swiss and Indian institutions. EPFL, VPRI of Lausanne, Switzerland plays a key role as the academic and research partner in this programme. The approximate project budget is about USD 46,500.

EPFL is also responsible for a number of other private and public alliances, such as the Indo-Swiss Academic Alliance, Indo-Swiss Scientific & Technological Cooperation, Indo Swiss Bilateral Research Initiative and the Indo-Swiss Joint Research Programme. Furthermore, EPFL has collaborated with premier Indian technical universities, such as IITs, IISc and IIIT for cross-border student internships and projects, creating a healthy mix of international minds. The number of students enrolled for the PhD programme at EPFL has been 43 and 51 for 2005 and 2006, respectively. The institute also conducts joint research projects at the IIT campuses. Faculties are brought in from both Switzerland and India. The Swiss project partners include ETHZ, IDIAP, University of Lausanne and University of Zurich.

Similarly, the UK-India Education Research Initiative (UKIERI) is aimed towards improving higher education and research along with creating of sustainable institution to institution links between the UK and India. The programme is backed by the Governments, the British Council, the education sector and businesses. The main activities of the programme include promoting research partnerships between centres of excellence and developing joint training courses.

And Last, but not the Least

The Government of India encourages the diffusion of higher education and research. It offers special subsidies and maintenance grants to state-funded institutes including the reputed establishments, such as IITs, AIIMS, etc. States such as Karnataka have additional norms to support public subsidies to the private sector. For foreign institutions, a 100 percent FDI is allowed via the automatic route in the education sector

Over the years, the government has been the largest spender in R&D and education. In 2004, it contributed 85 percent of the R&D spend in the country. Government bodies, such as the Department of Science and Technology support R&D through a number of initiatives. In terms of international regulations, it has adopted the WTO's IP regime formulated in 2005.

Students, in particular, are offered multiple advantages in the form of soft loans from nationalised banks, grants-in-aid, tuition fee subsidies, and so on. For example, in December 2005, the outstanding loans of the public sector banks under the education portfolio stood at USD 2,091million. Out of this, new loans disbursed in the first three quarters of 2005-06 amounted to USD 2,705 in 1,76,870 accounts. Moreover, loans up to USD 16,650 were given to meritorious students without collaterals.

India is fast becoming a country of growing importance to the world economy. The real strength of the country does not lie in its population, or cost advantage, but in its vast talent pool. An international university in India, can not only provide high quality training to the Indian technical graduates, but also leverage the talent pool for international R&D endeavours. Therefore, the entry of foreign universities in the Indian higher education sector creates a win-win situation for both the university as well as the Indian education and R&D industry.

About Evalueserve

Evalueserve provides the following custom research and analytics services to companies worldwide – Emerging Markets and Regions, Intellectual Property and Legal Process Services, Market Research, Business Research, Financial/Investment Research, Data Analytics and Modelling. Evalueserve was founded by IBM and McKinsey alumni, and has completed over 12,000 client engagements on behalf of global clients. Several hundred of these research engagements have focused on emerging markets and regions including China, India, South America and Eastern Europe. Nitron Circle of Experts, a recently acquired subsidiary, is an independent research firm which provides institutional investors with direct access to a network of senior industry executives in a wide range of industries. The firm currently has over 2,100 professionals located in research centres in India, China, and Chile. Additionally, Evalueserve's 45 client engagement managers are located in the major business and financial centres globally – from Silicon Valley to Sydney. For more details, please visit www.evalueserve.com.

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