

Local-Global Linkages between Higher Education Institutions, Public Labs, and Firms in ICT Gins in India

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Impact of Networks, Globalisation, and their Interaction with EU Strategies**



As we proceed

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Database

Cities chosen for survey	Number of Firms as per NASSCOM survey 2009-10	number of firms surveyed Manually	percent age of firms survey ed manual ly
	281	50	17.79
Delhi/Noida/Gurgaon	256	75	29.30
Mumbai	185	68	36.76
Pune	72	20	27.78
Chennai	147	39	26.53
Trivandum	184	20	10.87
Hydrabad	107	25	23.36
Cochin	55	10	18.18
Manual Total	1287	307	23.85
Online Total		18	
All Total		325	

Growth of Higher Education & R&D system in India

- Phenomenal increase in the Growth of HEIs and enrolment
- Greater emphasis of Professional education as compared to general education
- Greater Role for Private sector in Professional education
- Declining quality of manpower , declining out turn
- Increasing mismatch between what the industry needs and what is being produced
- Concentration of R&D
- Declining R&D Intensity at the national level
- Increasing role for Private Sector R&D
- But concentrated in a few sectors

Initiatives by firms, Govt, industry associations, IITs

- Infosys: Own training facility; interface with the universities and colleges wherein they influence the curriculum.
- NASSCOM has been working with Ministry of Human Resource Development to create highly specialized professionals with skill sets in emerging, “on-the-horizon” technologies that are not yet mainstream.
- Ministry of Human Resource Development (MHRD) with support from NASSCOM and the IT industry has recommended the launch of five new IIITs (Indian Institutes of Information Technology), based on the Public-Private Partnership model.
- Encouraged by the success of its Assessment and Certification program (NAC) for the BPO sector, NASSCOM has introduced a similar testing and accreditation offering, NAC-Tech, for the IT services sector.

- Another pioneering initiative by NASSCOM in partnership with the Ministry of Human Resource Development is the “Finishing Schools for Engineering Students”
- Nasscom also has initiated the IT Workforce Development (ITWD) program, keeping the issues and concerns of the industry at one end and challenges of the academia at the other end. As part of this initiative, NASSCOM has been nurturing the IT industry-academia interface through workshops and conferences, faculty sabbaticals, training programs and mentorship initiatives
- IITs

Incidence of R&D : The Survey

	Stand Alone	Subsidiary of MNCs	Head Quarter of MNCs	Total
R&D No	53.89	25.47	22	39.63
R&D yes	46.11	74.53	78	60.37
Total	100	100	100	100

Nature of R&D Activity

	Regular & centralized	Regular & decentralized	Regular	Occasional & centralized	Occasional & decentralized	Occasional	Total
Pharma, Chemical & Biotech	67.3	13.5	80.8	7.7	11.5	19.2	100
IT and Electronics	48.1	16.5	64.6	7.6	27.9	35.4	100
Automobile	48.6	8.6	57.1	20.0	22.9	42.9	100
Textile & Garments	10.0	0.0	10.0	5.0	85.0	90.0	100
Machine tools	39.7	4.8	44.4	30.2	25.4	55.6	100
Others	41.9	4.3	46.2	17.1	36.8	53.8	100
Total	43.5	8.0	51.6	15.0	33.4	48.5	100

Complimentarity between R&D and university interaction

	No interaction	Any interaction	Total
Stand Alone			
No R&D	73.33	26.67	100
Did R&D	38.96	61.04	100
MNC subsidiaries			
No R&D	74.07	25.93	100
Did R&D	34.18	65.82	100
MNC head quarters			
No R&D	54.55	45.45	100
Did R&D	5.13	94.87	100
All firms			
No R&D	72.09	27.91	100
Did R&D	30.26	69.74	100

International knowledge flows in the ICT sector in India

- Of the 324 firms that were surveyed , a majority of the firms reported that they had some form of interaction with universities or public funded research institutes in India.
- More than 53 percent of the firms reported interaction. Of these, about 47 percent stated that they had interacted with local universities or RIs.
- About 31 percent of the firms interacted with foreign universities or RIs.
- While 24 percent of the firms had interacted with both foreign and local universities. This represents a moderately high level of interaction between universities and firms in the sector.

- However, the levels of interaction among the ICT firms are marked by vast differences across firms classified on the basis of organizational structure.
- While the MNCs that are headquartered in India recorded a very high level university interaction (84 percent of the firms), for the stand alone firms this was much below the average.
- The share of firms that recorded any interaction among stand alone firms was only 43 percent.
- On the other hand, share of the MNC subsidiaries in India having any interaction was 55 percent. Thus the Indian MNCs seems in general to interact more with the universities and research institutions than MNC subsidiaries and stand alone firms.

Regional Variation

- There seems to be substantial regional variation in the incidence of university industry interaction. While in Bangalore, 94 percent of the firms reported having interaction with universities, and in Delhi it was 77 percent, in Mumbai it was as low as 13 percent. In other regions like Pune , Trivandrum and Hyderabad it was still less.
- The incidence of interaction with foreign universities was relatively less compared to local universities in most regions.
- In Bangalore while the share of firms that interacted at the local universities were 90 percent , only 40 percent of the firms interacted with foreign firms.
- Similarly, in Delhi while 71 percent of the firms interacted with local universities and Research institutes, only 49 percent of the firms interacted with foreign universities. In Mumbai , where the overall interaction levels were very weak; there were no instances of interaction with foreign universities.

Interaction with foreign universities

- The maximum share of firms that collaborated was with North American universities and RIs.
- Of the 314 firms that reported their location, only 38 firms (12.1 percentage) could have any interaction with North American universities.
- The next largest incidence of interaction was with South American firms, followed by West Europe and Central& East Europe.
- While Bangalore and Chennai had their university interaction largely originating from the North America, in case of Hyderabad and Delhi the main university interactions came from South America. West European universities and RIs came only a distant third interacting with Indian firms in almost all regions across the country. Moreover, interaction of Indian firms even with Asian economies was only marginal

Motivations of Interaction

- The motivations for offshoring among the Indian firms were closely related to availability of knowledge based inputs.
- Availability of specialized knowledge in the host region was the important reason motivation for offshoring of production.
- Human capital availability, infrastructure availability and other services were also important motivations for offshoring of both production and innovation.
- The functions of the firm are still centralized, though there was some delegation with regards to technology and process development to subsidiaries in the developed countries.
- More than 73 percent of the firms stated that technology and process development was internal to the plant of the firm. Only 11 percent of the firms had process development being delegated to subsidiaries in developing countries. Even then most technology development was firm specific and internally generated.

- The limited interaction that firms have with foreign universities and research centers by and large reflects on the firms internationalization strategies as well.
- Most firms did not have a propensity to outsource the functions of the firms to their partners.
- The delegation of functions seems to move among the subsidiaries of the same firm.
- More than 73 percent of the firms stated that technology and process development was internal to the firm.
- Only 18 percent had subsidiaries of the firm in developed country and 11percent of the firms had process development being delegated to subsidiaries in developing countries.
- Even then most technology development was firm specific and internally generated.

- **Nearly 70 percent of the firms felt that support from public funded centers of innovation and internationalization carried a negative attitude towards internationalization efforts of the firm.**
- **This was true in case of public support and incentives, international exposure to universities, and training of labour force for internationalization. In all of these factors of internationalization, the firms largely state that the role of these institutions were negative and did not encourage internationalization.**
- **Thus the public/state does not seem to support internationalization of firm's innovative activity in any active way.**