Labour Market and Recruitment: Education and Employability – Learning from the Indian IT / ITES Industry

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1 Abstract

Lack of technical and interpersonal skills in Indian engineering graduates remains one of the major reasons for low employability of young technical graduates and hence it has become a constraint to the growth of the Indian economy. 60% of the country's population will be in the working age group by 2020 and India has a very good opportunity to take advantage of its demographic dividend. But without a clear educational and competency building road map, it could also turn against it leading to large levels of unemployment amongst the fresh graduates. The Government's target to skill and employ 500 million people by 2022 shows the urgency of the situation, but it will require a well-defined strategy and effective execution by collaboration between industry, academia, professional institutions and government to achieve the vision of employment for everyone. This study develops a model for enhancing the employability of graduates, specifically of engineering graduates, by examining the following aspects in context of the Indian Information Technology (IT) Industry:

1. What are the key factors that have led to a decline in employability of engineering graduates in India?
2. What have been the key initiatives taken by the Indian IT industry which have helped the industry to grow for the last two decades in spite of the low level of technical knowledge and employability of Indian graduates?
3. What are the initiatives taken by the Indian Government, Indian academic institutes, industrial associations, National Skill Development Corporation (NSDC) and private software training centres to overcome the problems of competence and employability of graduates in the Indian IT Industry?

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Based on extensive studies of the Indian IT industry (Agrawal and Rao 2002; Agrawal and Thite 2006; Agrawal, Khatri and Srinivasan 2012), the authors conclude that technical competencies and soft skills are very important for an engineering graduate aspiring to work in the Indian software service industry. The findings suggest that the Indian IT industry to a large extent has been able to overcome these challenges by on-the-job training and by effective collaboration between multiple stakeholders interested in the growth of the Indian IT industry. The authors suggest that similar strategies and interventions have to be used in other sectors to enhance the employability of young graduates. Various agencies need to ensure that the young graduates are facilitated to acquire finishing school training before they join an industry. The industry and organisations need to work in collaboration with the government agencies for providing finishing skills training on a large scale. In addition, technical institutions should actively work in collaboration with industry leaders to learn about emerging challenges in the context of new technologies and new markets with which Indian organisations have been working after liberalization of the Indian economy. The newly constituted NSDC is expected to play a major role in improving the linkages between Indian industries, academic institutions and private training agencies by defining the skills requirements, skill assessments and creating opportunities of superior learning for the young graduates (see chapter 13).

2 Introduction

The abundance of capable, flexible and qualified human capital has gradually led to India evolving as a knowledge-based economy. However, India needs to further build up and empower the human capital to ensure its global competiveness. With the opening up of the economy and rise in exports, enhancing the productivity of the workforce is a major challenge for many corporations in India. Further, as the Indian economy grows, a large number of skilled persons would be required to sustain its growth (Chenoy 2012).

The Indian economy grew at an impressive rate of about 7% on an average over the five year period 2005-2009, including the year of the enormous financial crisis in 2009. However, the shortage of skills has been one of the major limitations in most industries in India (World Bank 2008; Aurora and Dhingra 2009). Both manufacturing and service sectors are in difficult situations due to unmet demand for skills. According to National Association of Software and Services Companies (NASSCOM) (NASSCOM and McKinsey 2005), only 25% of the engineering graduates are employable by a multinational company. The rest would have to go through rigorous training before companies could effectively

employ them. Many employers link this lack of skills to the shortcomings in the education system. The higher education system has somehow responded to the rising demand for engineers by massively expanding the supply of engineers by increasing the number of seats available for engineering education by about 800% during the period 1998 to 2008 (GoI 2008). Gautam, Chopra, Jha and Singh (2010) observed that this quantitative expansion led to an average decline in the quality of the students being enrolled, the quality of teaching and learning and the quality of graduating engineers.

A World Bank Report (2000) on Indian scientific and technical manpower development observed that the scientific and technical manpower development in India has been highly theory focused rather than practice-oriented. The technical institutions in India have not kept pace with the development in knowledge and technology and do not ensure that graduating students are ready to work as professional engineers in the industry. And hence, the task of making educated technical manpower productive at the earliest after graduating has yet to be realised by a large number of technical institutes.

Given the lack of readiness of technical graduates, one would expect organisations to invest in a big way in 'in-service' training. But the World Bank Report (World Bank 2008) on India Country Strategy for the Year 2009–12 observed that 'in-service' training would be received by only 15% of workers in the Indian manufacturing sector, which is far below what is observed in many other countries. Inadequate availability of training capacity is one of the main reasons for a comparatively small percentage of Indian manufacturing workers being planned to be trained. An International Labour Organisation Report (2011) observes that 80% of the fresh entrants to work force in India do not get any kind of skill training (see chapter 5).

By the year 2022, about 700 million Indians are estimated to be of working age and about 500 million will require some kind of vocational or skill development training. The government has identified ten sectors each in manufacturing and service sectors with high growth potential for providing employment. The total estimated requirement of skilled work force by 2022 will be about 300 million (GoI 2009).

In the following section we discuss the case study of the Indian IT/Information Technology Enabled Service (IT/ITeS) industry, as it employs the biggest share of the 600 thousand engineering graduates that India produces every year and has been able to show a consistent growth despite all the problems related with engineering education discussed earlier in the paper. We examine the various initiatives taken by NASSCOM, Indian academic institutes, the Indian Government and the government agencies to overcome the problems and challenges faced. Based on our findings from the case study, we develop a model to show the ways

of enhancing the employability of fresh Indian graduates in other industries and the service sectors.

3 Indian Information Technology/Information Technology Enabled Service Industry: Growth and Challenges

The Indian IT/ITeS industry has become an integral and an important part of the Indian Economy because of its size in terms of revenue, profitability, foreign exchange earnings, number of people directly and indirectly working with the industry and its cumulative rate of growth. The estimated revenue of the Indian IT industry is about 7.5% of India's GDP, about 25% of Indian export and 11% of total services revenue (NASSCOM 2012). The total direct employment in the industry till 2013 has been about three million while the indirect job creation has been estimated at almost nine million. India's share in the global outsourcing market rose to 58% in 2011 from 51% in 2009. India's IT and Business Process Outsourcing (BPO) sector exports are expected to grow by 12 to 14% in 2013-14 and touch 84 to 87 billion US Dollars, according to NASSCOM (2012). The growth till date of the Indian software industry has been mainly due to its cost competitiveness and the availability of a large pool of engineering graduates.

During the last 20 years, many of the problems related with employability of young graduates, were also experienced by the Indian IT industry. However, the IT industry and the stakeholders interested in the growth of the Indian IT industry such as academic institutions, the Indian Government and its agencies, NASSCOM and private training centres have taken a number of initiatives to enhance the supply of employable fresh graduates. In the following sections, we discuss some of the major problems faced by the Indian IT industry and initiatives taken by the Indian IT Industry and its stakeholders to overcome those problems. Based on the learning from the case study of Indian IT/ITeS industry for enhancing employability of young graduates, we develop a model for enhancing the employability of young graduates. The industries in manufacturing and service sectors can examine the possibilities of using the model for enhancing the employability of fresh manpower they aspire to recruit for sustaining their growth.

4 Information Technology/Information Technology Enabled Service Human Resource Challenges and Initiatives to Overcome Them

4.1 Shortage of Qualified Workers

The Indian IT industry has been mostly recruiting engineering graduates because of the perceived notion that engineers because of their superior analytical skills and learning capabilities can do a better job of software development (Gokuldas 2010). Since the Indian IT industry has been growing almost for two decades starting from 1991 at 30 to 40% cumulative growth rate, the industry has been recruiting fresh engineering graduates irrespective of their engineering discipline. Large IT companies such as Infosys and TCS provide three to six months technical training to fresh engineering graduates about industry practices (see chapter (chapter 8 and 11). The training curriculum focuses on software skills and on project management basics. In addition, some inputs related to soft skills are also covered as a part of the training programme.

4.2 Increasing Cost of Manpower and Training

Low manpower cost and abundant supply of trained manpower have been factors contributing to the growth of Indian IT industry in the initial years. However, the rapid growth of the Indian IT industry led to increase in manpower cost and companies have been finding it difficult to put a very large pool of fresh manpower through long duration programmes. In addition, training cost has also increased significantly in the last decade. In addition, since the Indian IT companies have been diversifying their market and customer portfolios across new geographies and new domains, senior managers also needed to be trained in domain competencies, business management skills and cross-cultural intelligence.

Indian IT companies have been adopting new and innovative way to reduce the training costs and simultaneously increase the number of trained software professionals. Classroom training is substantially replaced by e-learning including learning through mobile applications. Companies are partnering with vendors who train freshers even before they are hired. Organisations such as HCL are moving towards providing 'just-in-time' training for roles being given to employees. The focus is on substantially reducing classroom training time and the cost of training. Mindtree, a software company which delivered 90% of its training through classrooms till a few years ago, has brought down the classroom training to 40%, with 60% online training. It has helped Mindtree to slash training costs by a third and has helped the organisation to enhance the number of people being trained by

them. Harvard Business School courses being very expensive were reserved only for senior managers. Since now these courses are available online at a much lower cost, even middle managers are nominated for these management programmes.

4.3 Lack of Soft Skills

The results of a survey (Viswanadhan 2005) indicated that new engineers perform only at an average level in the area of 'knowledge of technology' and 'technical skills', below average in 'behavioural skills' and just satisfactory in 'managerial skills'. It has been found that students' performance in terms of soft skills has a considerable significance in ensuring the employability of engineering graduates in campus recruitment drives (Gokuladas 2010). Soft skills are behaviours which can be learned through training and application (Rani 2010). The IT industry lays great emphasis on the fact that graduates destined for a corporate career need to acquire a certain level of proficiency in written as well as oral communication skills, team building, leadership and time management. Doke and Williams (1999) found that computer programming knowledge and skill becomes less important as the career of an IT professional progresses.

Many IT companies have introduced soft skill training for their fresh recruits along with the regular technical training. For example, the 'Global Education Center' of Infosys delivers soft skills and leadership training for fresh graduates as well as for senior and middle level managers. As a part of the soft skills module, the training is imparted on global etiquettes, comportment, importance of body language, public speaking, improving interpersonal communication and team-building. Experiential training methods such as case studies, games and role-plays are extensively used to enhance the effectiveness of soft skills and leadership training.

4.4 Delivering Current Technology and Practice oriented Curriculum

Indian university systems being rooted in strong bureaucracy do not facilitate continuous up gradation of curriculum in line with the need of the Indian IT industry. Hence, the fresh graduates from university systems do not have the latest knowledge and need to be trained by the employing organisations. For resolving this problem, many IT companies have started sharing current technical knowledge and industry work practices with the academic institutes. IT companies have also started academic programmes to train their employees in collaboration with the academic institutes (see chapter 8). Wipro and Cognizant Technology

have started sandwiched academic programmes in collaboration with reputed academic institutes. Wipro has started an academy of its own known as Wipro Academy of Software Excellence (WASE) to train and create its own software professionals. It offers a four year sandwiched postgraduate programme in collaboration with a well-known engineering institute, namely Birla Institute of Technology and Science (BITS), Pilani. The programme is meant for fresh science graduates with specializations in Physics, Mathematics, Computer Science or Electronics. The applicants should have less than one year of experience. The programme consists of alternate modules of classroom inputs by BITS faculty and on-the-job training in different divisions of Wipro. Further, some software companies also offer employment to computer science and IT teachers during summer vacation. This scheme provides an opportunity for university teachers to work for about three months per year in software and IT companies. Three months is a reasonably long period for university teachers to update themselves with what is current in the industry (Agrawal and Rao 2002).

Many multinational companies have formed partnership with academic institutions on specific initiatives such as faculty development, internships for students and curriculum revision workshops. For example Coimbatore-based Karunya University and Novell Inc., a multinational software and services company headquartered in Provo, Utah recently collaborated with each other under which the University is offering a Master of Technology (M. Tech.) programme in IT. A team of professionals from Novell have trained 15 Karunya faculty members on 'train the trainer programme'. They have also set up the Novell Center of Excellence on the campus to support lab experiments of post-graduate students. As part of the agreement, Karunya University is an authorized Novell Practicum Center where students can write certificate examinations and become Novell certified professionals after finishing their course (Rege 2014).

4.5 Shortage of Faculty

The phenomenal growth of engineering institutes in India has led to substantial shortages of faculty. Even the national institutes of technology such as Indian Institutes of Technology (IITs) and Indian Institutes of Information Technology (IIITs) have been experiencing shortage of faculty. Due to substantial differences in pay and other facilities being offered by academic institutions and software companies, academic institutions are not able to attract and retain bright software professionals as teachers. Students from IITs and other better colleges have been getting jobs with excellent salaries in software organisations. As a consequence, registration for post-graduate and doctoral programmes was extremely poor in the

last decade even in the IITs. A few students who aspired to study advanced courses in IT and software related fields preferred to study in US universities rather than in Indian universities. Apparently, many of them prefer to settle in USA after completing their post-graduation or doctoral programmes. As a consequence, the supply of professionals with high qualifications in software related fields was very meagre in the last decade. This in turn has affected the availability of professionals who could join teaching professions in national institutes and corporate and private training centres (see chapter 9).

Viewing this, some software organisations have adopted colleges in their vicinity, providing computer science and IT courses. These organisations provide infrastructure support to these colleges. But more importantly, many of them, on a regular basis, provide faculty support to these colleges. It helps the institutes to teach the latest tools, technologies and work practices in their academic programmes. Further, for attracting candidates for the post-graduate and doctoral programmes in software and related subjects, a number of software organisations, in the recent past, have offered very attractive scholarships for post-graduate and doctoral programme students in software and IT related disciplines in IITs and Indian Institutes of Management which would help in creating more researchers and teachers (Agrawal and Rao 2002).

Infosys had launched a programme called ‘Campus Connect’ in 2004 to enhance the quality and quantity of the IT talent-pool to sustain the growth of the IT industry itself. Infosys works with academic institutes to align college curriculum with the industry's requirements. The company organises seminars and training sessions for the faculty to give them an industry perspective, enabling them to train students accordingly. In addition, the company also develops industry-oriented topics, and makes the courseware available to students (Infosys 2014).

Apart from these initiatives by the Indian IT organisations, several new measures were taken by national universities, the NASSCOM, the Government, NSDC and private training institutes for enhancing the employability of the young graduates in the Indian IT Industry. In the following sections, we examine some major initiatives taken by these agencies and institutions.

5 Initiatives Taken by National Universities

In the last decade, national institutes like the IITs, the Indian Institute of Science (IISc), the IIITs and the Indian Institutes of Management (IIMs) have taken a number of initiatives to provide leadership to colleges teaching software and IT related courses in the university set up. Some of the innovative initiatives by these national institutes have been in the area of developing course material for software courses, training the teachers, offering their degree programmes at multiple locations and

providing short-duration training programmes for the software industry. In addition, these national institutes have been offering a number of courses in distance education mode. Some of these initiatives are described below:

- IIT Bombay recently started the 'Spoken Tutorials' project which attempts to provide IT training through audio-video tutorials, created for self-learning (Deshpande 2014). The topics covered are programming languages, simulation and circuit design platforms and office productivity tools, all using open source software. It has been a resounding success with more than 300 thousand students getting trained on different aspects. Interestingly, many students who have learnt software using Spoken Tutorials are able to secure jobs in the IT sector, sometimes in multinational corporations, just on the strength of training received at Spoken Tutorials. The Spoken Tutorials Project was started in 2010 with funding from the National Mission on Education through Information and Communication Technology, of the Ministry of Human Resource Development (MHRD). Due to this funding, the course is available free to participating students (Deshpande 2014).
- The National Programme on Technology Enhanced Learning (NPTEL), a project funded by the MHRD India, provides e-learning through online web and video courses in engineering, sciences, technology, management and humanities. This is a joint initiative by seven IITs and the IISc Bangalore. It has developed curriculum based video courses and web-based e-courses targeting faculty and students offering undergraduate engineering programmes (NPTEL 2014).
- A collaboration agreement between the IIITs, Bangalore and Samsung Research and Development Institute India, Bangalore was signed recently on January 21, 2014 at the IIITs Bangalore campus with the objective of fostering collaboration between the two institutions to promote academic and research interactions for industry-centric knowledge and skill development. The institute would run educational programmes to meet the human resources development needs of Samsung leading to specific degrees from the IIIT, Bangalore through its Work Integrated Learning Programmes. These programmes will have the same rigor and standards as those offered on-campus and will be equivalent to the corresponding degrees offered on-campus (This Week Bangalore 2014).
- Infosys Technologies has initiated a Special Training Programme (STP) partnering with universities in five Indian states, which include the IIIT, Bangalore, Institute of Electronic Governance, Jawaharlal Nehru Technological University in Hyderabad, Symbiosis Institute in Pune and

Malaviya National Institute of Technology, Jaipur (Infosys 2008). The main aim is to build competencies and enhance the employability for engineering students from socially disadvantaged sections. The STP curriculum balances technical training, soft skills training, guest lectures, industry visits and team project work, over a period of six months. In the year 2012 around 449 of the 552 trained students had been placed in established companies and had been recognised as high performers.

6 Initiatives taken by National Association of Software and Services Companies

Established in 1988, the NASSCOM is a trade association of the Indian IT and Business Process Outsourcing BPO industries. NASSCOM facilitates business and trade in software and services and encourages the advancement of research in software technology. Some of the key initiatives taken by NASSCOM to enhance the Indian IT industry are:

- Mentor skilling programmes: In the recent years, a number of start-ups have risen and have contributed over five billion US Dollars to the Indian IT industry. To encourage this activity, NASSCOM has started various mentor-based programmes with the aim to advise smaller players about how to compete effectively against big IT companies (NASSCOM 2014a).
- Capacity Building: Recognising the urgent need to bridge the existing skills gaps within the IT-BPO sector and help improve the employability and quality of manpower emerging from India's education system, NASSCOM has remained extremely active within the skills development space. More recently, under India's NSDC initiative, NASSCOM has become a part of the IT-BPO Skills Sector Council (SSC).
- NASSCOM is also helping the industry to gain clarity on the competencies required for industry sub-verticals including IT services, BPO services, knowledge services and remote infrastructure/infrastructure management services (RIM/IMS). In order to gauge the proficiency of people for careers within the IT-BPO industry, NASSCOM has launched the NASSCOM Assessment of Competence (NAC) and NAC-Tech initiatives, and is helping the industry to gain an idea of the kind of manpower available at the entry, middle and higher levels (NASSCOM 2014a).
- NASSCOM is developing national occupational standards based on job numbers and roles to determine the kinds of competencies and training

required. It is planning to put a blueprint in place so training providers can integrate their course planning based on the manpower requirement of the Indian IT industry.

7 Initiatives Taken by the Government

In addition to providing support to national institutes for furthering the cause of software education, the Government of India has taken some major initiatives to promote the IT industry and IT education in the country.

- The MHRD and some state governments have provided support for starting national level autonomous institutes for IT education namely, the IIITs. These institutes combine the innovativeness of autonomous academic institutions and the experience and market responsiveness of the corporate world.
- National Resource Centre for Free and Open Source Software (NRCFOSS) is an initiative of the Department of IT, Ministry of Communications and Information Technology, Government of India. NRCFOSS, setup in Chennai in April 2005, plays a huge role in strengthening the Indian Software industry. The Centre for Development of Advanced Computing (C-DAC), Chennai is one of the implementing Agencies of NRCFOSS. C-DAC has been doing significant work in the field of finishing school training such as e-learning courses on Linux kernel programming, Linux system programming and device drivers, workshops like BOSS (Bharat Operating System Solutions) and Open Office workshops (NRCFOSS 2014).

8 Initiatives Taken by the National Skill Development Corporation India

Launched in 2009, the NSDC is a one of its kind public-private partnership in India which was set up as part of a national skill development mission to fulfil the growing needs in India for skilled manpower across sectors and narrow the existing gap between the demand and supply of skills. Some recent initiatives are:

- NASSCOM and the NSDC have focused their efforts on helping the youth of India acquire IT skills which would improve their employability (NASSCOM 2014b). Both these bodies supported Indian participants at the Forty Second World Skills Competition, 2013 at Germany.

- The IT/ITeS SSC was formed between NASSCOM and the NSDC (NASSCOM 2014b). The primary objective of this Council is to develop the workforce in the IT and ITeS sectors. Unique job roles and qualification packs have been created at the entry, middle and leadership levels.

9 Initiatives Taken by Private Training Centres

- Corporate and private software and IT training centres came into existence during the 1970s to provide education for computer awareness. The growth of the IT industry has led to an increased demand for these training centres providing on-the-job training, running skill development institutes and financially supporting non-profits and social businesses as providers of the training. They also act as accreditation bodies. Accreditation is a process of establishing requisite elements of vocational and educational training and its ability to carry out evaluation of competence acquired by the students, so as to make professional judgment (Agrawal and Rao 2002).
- The Cisco Networking Academy (NetAcad) is a corporate institute responsible to train students to gain skills needed to build, design and maintain computer networks, thus improving their career prospects. Currently, there are over a 160 Cisco Academies (across 26 states and union territories) with more than 700,600 students currently enrolled in the programme. In India today there are over 670,000 Cisco certified professionals. In addition to imparting IT knowledge and networking skills, NetAcad also aims to bridge the 'digital divide' as it takes technical education to rural India including technologically backward states like Kashmir, Orissa and Tripura. The NetAcad is in line with the needs of Indian colleges, and features project-driven training in high-demand job skills. The curriculum designed by NetAcad incorporates hands-on experience when teaching students about computer networks (Cisco 2014).
- NIIT, a private company was set up in 1981to provide professional IT training to students and professionals interested in the Indian IT industry. Currently it also provides domain training in fields such as banking, finance and insurance. NIIT has also introduced Yuva Jyoti, a joint venture between NIIT and NSDC, which offers vocational skills training programmes to enhance employability of youth across India (NIIT 2014).
- Looking back at the Indian training companies in the field of IT, it seems that they have done significant work in terms of creating computer awareness at multiple levels in different strata of the society and literally in

every part of the country. Being autonomous agencies, these training centres are able to adopt quickly and offer courses in new and proprietary technologies (Agrawal and Rao 2002). However, due to absence of regulatory authority, unscrupulous operators have also entered the training field in a big way and have deceived the public by charging high fees and giving false hopes of highly attractive jobs following the training. The franchise system has helped in the faster growth of the training industry. However, it has also led to a dilution of quality standards. The course design and the course content of many of these programmes are quite good. But many of these training centres do not have adequate infrastructure and faculty. It seems that the corporate and private training centres will continue to play a significant complimentary role for providing human capital for the growth of Indian software and IT industry. However, the training industry should proactively develop certain professional norms which will make it difficult for unscrupulous agencies to enter into the field. Further, the industry should avoid the temptation of over selling training programmes to people who do not have the basic competencies to meet course requirements (Agrawal and Rao 2002).

These initiatives by the Indian IT industry, national academic institutes, the Government and its agencies, NASSCOM, NSDC and private training institutes have been able to sharpen the competencies of fresh graduates aspiring to join the Indian IT/ITeS industry. It has in turn lead to an increase in their employability and has also contributed towards the manpower need of the IT industry. Table 1 provides a summary of the steps taken by IT organisations, National academic institutions, NASSCOM, the Government and NSDC.

IT Organisations	Providing finishing school/practical training to fresh graduates Adopting engineering colleges and providing faculty support Shaping the curriculum by sharing IT industry practices with academia Providing soft skill training Initiating sandwich programmes combining work and advanced technical knowledge
National Academic Institutes	Audio-visual training programmes for self-learning Online web and video courses on advanced technology Need-based postgraduate programmes with a focus on research and knowledge creation Employability-enhancing courses for engineering students from socially-disadvantaged sections of society
NASSCOM	Defining competencies of various job positions to assist the training providers Entrepreneurial support to young engineers Facilitating interactions between industry , academia and government to build workforce capacity
Government	Setting up IIITs to provide superior education Started CDAC to provide finishing school and advanced e-learning
NSDC	Coordination between industry, government, and training agencies to define and build the competencies required Developing standards and an accreditation system for quality training Involving large organisations in capacity building by training manpower
Private Training Centres	Providing on-the-job training Running skill development institutes Financially supporting non-profit organisations and social businesses in the delivery of training Providing accreditation

Table 1: Initiatives taken by various agencies/organisations to enhance the employability of young graduates in the Indian IT industry. Source: Compiled by authors

In the following section a model has been developed based on the case study of Indian IT/ITeS Industry as discussed above. It focuses on similar attempts that should be made by other industry sectors to enhance the human capital for sustaining their growth. The model highlights the initiatives which need to be taken by academic institutions, government and its agencies, corporations and private institutions to enhance the employability of the young graduates.

10 A Proposed Model to Reduce the Employability Gap

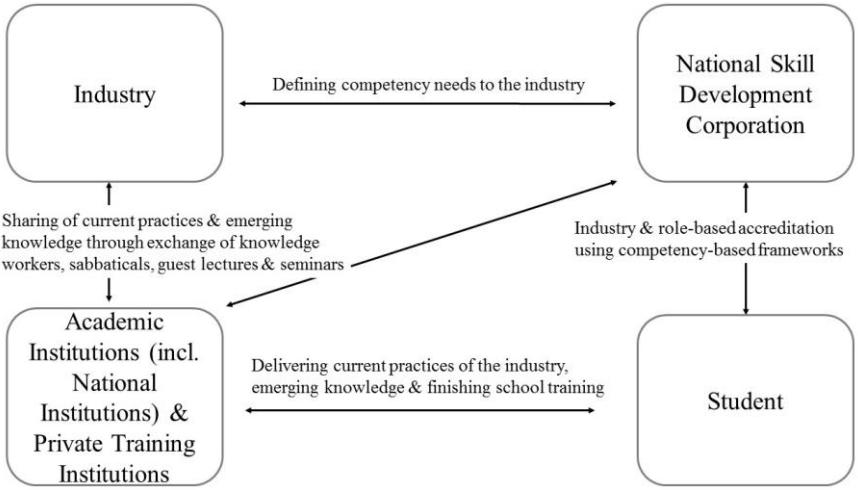
Based on the analysis of the initiatives taken by the Indian IT industry and various stakeholders associated with the industry for upgrading the skills and competencies of fresh graduates, we propose below a model to reduce the employability gap for the fresh graduates aspiring for employment. The model focuses on enhancing

the quality of higher education by improving the quality of collaboration between industry, academic institutions, industry associations, government and government agencies, NSDC and other agencies. This model is represented in Figure 1 and it is discussed below.

10.1 Effective Collaboration between Industry and Academic Institutions

Industry leaders and academic institutions should collaborate on a continuous basis and be prepared to learn from each other. Industry should share emerging knowledge and work practices with the faculty and academic institutions so that these practices could be imbibed into academic curriculum. Academic institutions should also invite industry leaders to open Centres of Excellence on their campuses which will provide opportunities for the students to interact with the researchers and industry leaders on a regular basis.

Academic institutions should encourage its faculty to go on a sabbatical to an organisation of their choice. Similarly, organisations should nurture the culture of sabbatical and encourage executives to spend a few months being part of an academic institution. Organisations should also adopt an academic institution and depute their executives on a regular basis to teach a course or deliver guest lectures. Such interactions will facilitate transfer of knowledge and expedite the rate of learning for industry as well as academia. It will also create opportunities for organisations to discuss their problems and challenges with the academic institutions and jointly work along with them. The collaboration between industry and academic institutions would be a win-win situation for both.



Note: The government provides an enabling environment through tax incentives to the industry & funding for academic institutions & NSDC.

Figure 1: A model for enhancing the quality of education and learning to reduce the employability gap for higher education students. Source: Authors

10.2 Role of the National Skill Development Corporation

The NSDC has been created to develop linkages between industry, academic institutions and training institutions, and student community. The NSDC is expected to understand the knowledge, skills and competencies need of an industry sector by interacting with them on a regular basis. Further, the NSDC should share the knowledge, skills and competencies needs of an industry with academic institutions and training institutions. A superior understanding of the knowledge, skills and competencies needs of the industry will help academic institutions to revise their curriculums and deliver what is required by the industry. The NSDC is expected to interact with students and develop institutions and mechanisms to examine and certify students about their having necessary knowledge, skills and competencies for a given role and for a given industry. A third party certification of competencies makes it easier for the industry to get the right manpower (Sarkar 2013). The NSDC is thus expected to be a strong link between industry, academic institutions and training and certification agencies and ensure that students meet

the needs of the industry. The NSDC will provide funding and incentives for private sector initiatives for skill development. NSDC skill development funding takes the form of a loan or equity (NSDC 2014) (see chapter 13).

10.3 Government – Developing an Ecosystem

If the Government is to achieve its skill development goal, policy makers need to strengthen the ecosystem by supporting the labour laws, the Minimum Wages Act and the Apprenticeship Act (Business Standard 2014). The Government has been working towards strengthening its role as a coordinator between different agencies which are working towards skill development in India. The Central Government and state governments in collaboration with private companies have plans to set up Centres of Excellence which would focus on delivering emerging skill needs of the country. Each Centre of Excellence would have the latest hardware and software and be staffed with individuals from private companies. Through such programmes the Government will be supporting focused skill development within the country (Siemens India 2013). As an example, Siemens Industry Software signed a memorandum of understanding with the Ministry of Industries and Mines, Government of Gujarat for establishment of five Centres of Excellence for automotive, industrial machinery, industrial automation, aerospace, defence and ship building industry. The new government has taken its first step by announcing a separate Ministry, which will promote entrepreneurship and skill development in the country (The Economic Times 2014). The finance minister has also proposed a national multi-skill programme called Skill India which would skill the youth with an emphasis on employability and entrepreneur skills and the convergence of various schemes to attain this objective (India Today 2014). Though the new government has announced its vision of 'Skilled and Digital' India, proper implementation of these schemes would be crucial in order to attain the objectives.

11 Conclusion

The Government, industry, academia and the other stakeholders should work in collaboration with each other to improve the quality of education and reduce the employability gap. Industries should work in collaboration with NSDC to define the competencies required for productive employment. Academic institutions should interact and collaborate with the industries to know about the current technological practices and their work related challenges to redefine the curriculum on a continuous basis. An effective collaboration and willingness to learn from each other amongst the various stakeholders responsible for education and employment

will go a long way in bridging the gap between education and employability and help the country to benefit from its unique demographic advantages.

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