Employability of engineering graduates in IT sector – (A case study of COEP)
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ABSTRACT

Employability upon graduation is a major priority for most of the Engineering Students. Education is considered to be a process of skill formation and in this aspect it is treated at par with the process of capital formation. Economists often argue that as the demand for educational training increases, the system needs to meet with the country’s requirement for people with high levels of skill and knowledge. Higher Educational institutions and the world of work cooperate in many ways such as knowledge and technology transfer, consultancy services, research collaboration and employer inputs into academic courses. Students are more diverse but are the higher education institutions and graduate career opportunities going hand in hand. In this the response may be that the institutions are developing a variety of ways for enhancing student employability. The talent required by the IT industry is different from what a manufacturing industry wants or what a service industry requires, and often this is the major stumbling block. We have been unable to derive full economic benefit from this talent base because of the mismatch between industry needs and university output. The purpose of this study was to know the skill sets required by young graduates to enter the IT industry for their sustainability and to assess how there can be a value creation for better chances of survival in the tough global job market. The case study of College of Engineering, Pune (COEP) is also discussed as a sample case for Employability.

Key words: Engineering graduates, employers, employability, information technology, skill sets, COEP.

1. Introduction

Engineering education in India started during the British era and focused mainly on Civil Engineering. A brief history of Engineering Education in India is available in the Rao Committee report and the Ministry of Human Resource Development website. The Engineering College at Roorkee (1847), Poona Civil Engineering College at Pune (1854), Bengal Engineering College at Shibpur (1856), Banaras Hindu University (1916), Harcourt Butler Technological Institute, Kanpur (1920) were some of the earliest Engineering colleges established, that still continue to the present day. There has been a significant increase in the number of engineering institutions and in students coming out from these colleges. Engineering is a preferred career choice for a large number of students in India. India's substantial growth in recent years has resulted in a significant increase in demand for engineers. It is clear that since Independence, India has produced a large number of competent and qualified engineers who have contributed to the success of many Indian industries. A large number of engineering graduates from COEP have also made an impact in the corporate world internationally.
Information technology companies, now a major part of the Indian private sector, have been prominent in such recruitment, but the competences they seek in engineering students appear to be different in terms of priorities from those sought by core engineering firms. In recent years the growth of the Indian IT industry has been of great interest to the international IT community. Nearly one third of fresh Indian engineering graduates are currently joining the IT industry irrespective of their specialization. The success of the Indian IT industry, however, has not been yet been leveraged for developing India as a preferred destination for engineering education, even in the disciplines related to information technology. Internationally, reforms in engineering education have a long but slow history. Last decade saw an increasing recognition of the need for the transformation of engineering education. The Indian engineering education sector can tremendously help the IT industry to make a much larger contribution in higher value-added markets.

2. Employability

Employability in Engineering Institutes is generally determined according to students’ success in campus recruitment process. The concept of “employability” is the acquisition of the right attributes knowledge, skills, attitudes, and competencies in order to increase the likelihood of graduates successfully gaining meaningful employment and fulfilling their potential in their chosen occupations. In the past employability was narrowly defined as the proportion of graduates from an institution that were employed after graduation (Rao, 2003). But clearly employability is not just a quality of the graduates, or the outcome of their training and education, but also a characteristic of the prevailing conditions in the labour environment. As stated by Harvey, L. (2001). Higher Education institutions can empower learners to develop attributes, techniques, and reflective abilities, thereby placing emphasis less on “employ” and more on “ability” and shifting to graduate achievement, “graduateness” and “graduate attributes”. “Graduateness” implies that someone who has completed the requirements of a university degree has developed the attributes that prepare them to contribute to society, not just to be “industry ready”.

Employability is about making closer links between education and the world of work. The prominence of the employability agenda and the responsiveness of higher education institutions means that there has probably not been a better time for employers, to help enhance curricula and to make mutually beneficial links with higher education institutions. Employability is one of the major concerns in India. This is also being stated by former President of India Dr. A. P. J. Abdul Kalam “India should emphasis more on Employability than on Employment.” The need of Employability is marked on shoulders as responsibility on both the Institutions and Industry. Industries can play an important role in number of ways including offering work placements and liaising with departments and institutions which may supply future employees. Several higher education institutions across the world have developed many programs for enhancing employability for the engineering graduates.

A degree is a fantastic start but the students also need to plan for their future career. Institutions must ensure that career and employability programs are as strong and effective as possible. It is essential to ensure student employability is right up there on their agenda, especially in the light of the highly competitive market and with the raised students and parent’s expectations. Training and Placement cell of an institute plays a vital role in involving students in planning and building their own future early enough, for example by guiding for preparing a proper CV, indulging in several projects and involvement of the
students in different social and cultural activities etc. Training & Placement Cell also roles as a catalysts, consultants and as trainers for the employability of graduate engineers.

3. IT Sector boom in India

The IT industry has not only transformed India's image on the global platform, but has also fueled economic growth by energizing the higher education sector especially in engineering and computer science. India's cost competitiveness in providing IT services, which is approximately 3-4 times cheaper than the US, continues to be its unique selling proposition (USP) in the global sourcing market. By the mid-1980s, word had spread that India had a good talent pool and it came much cheaper. Besides mainframe and minicomputer vendors who were using Indian software engineers extensively, partners American OEM software vendors too began working with Indian firms to get products developed cheaply for their markets.

In the 1970s, Mr. F.C. Kohli convinced Burroughs to farm out some software development work to TCS. He says: 'The main thing is that you need somebody to test you out, and they (Burroughs) could test us out.' At the same time, pioneers like TCS learnt a lot from technical journals, professional societies like IEEE and through interaction with leading American universities. For instance, TCS benefited from the migration and conversion tools developed at the Carnegie Mellon University, says Mr. Kohli. This attributes the early development of Indian IT Sector like TCS to its association with Burroughs: 'Burroughs was one of the top three companies in the world in terms of fundamental concepts in micro-programming and software architecture. In the same way the multinationals discovered the Indian software talent (Sharma 2008). TCS in collaboration with Burroughs set up the first software zone, SEEPZ in Mumbai. In 1973 SEEPZ became the first software export zone which saw 80% of the software export in the 1980s. Since then, the IT sector of India has grown by leaps and bounds and has acquired India a brand name in the IT and ITeS sector.

IT industry in India has played a key role in putting India on the global map. IT industry in India has been one of the most significant growth contributors for the Indian economy. The industry has played a significant role in transforming India’s image from a slow moving bureaucratic economy to a land of innovative entrepreneurs and a global player in providing world class technology solutions and business services. The industry has helped India transform from a rural and agriculture-based economy to a knowledge based economy. It has made tremendous impact on the lives of millions of people who are poor, marginalized and living in rural and far flung townships. Internet has made revolutionary changes with possibilities of e-government measures like e-health, e-education, e-agriculture, etc. Today, whether its filing Income Tax returns or applying for passports online or railway e-ticketing, it just need few clicks of the mouse. India’s IT potential is on a steady march towards global competitiveness, improving defense capabilities and meeting up energy and environmental challenges amongst others.

The IT and ITeS sector has generated massive employment in the past and continues the trend of providing jobs. With online shopping, social media and cloud computing flourishing more than ever before, there is great demand for IT professionals in e-commerce and business to consumer firms. Organizations like Wipro, Infosys, Accenture, Cognizant and TCS add highly to the employment rate. After Bangalore – the silicon city of the country, Pune is also on a hiring sphere. The IT and ITeS sector are likely to grow every year and Pune is amongst the top 3 preferred cities for these tech jobs. IT companies of India had a golden time during
2012. IT and ITES sector of India standing at the crossroads, Software Services Industry Body NASSCOM is absolutely positive about the growth of India’s IT sector. According to NASSCOM, “‘newer geographies’ are set to double their contribution to India to 20% by 2020”. As per the estimation of NASSCOM purely domestic and export services of the Indian IT sector is expected to generate US$ 225 billion by 2020. The landscape of the global IT and ITES market is changing rapidly and India is still a major brand name in the global IT and ITES sector. Hence there is a need to create more employable IT Engineering Graduates.

3.1 Skill sets related to IT industry

Education and Training are also emerging as key drivers of competitiveness. As the global economy has become more complex, it is increasingly evident that maintaining competitive advantage in global markets requires boosting of human capital endowments of the labour force. This is made possible only when its members have access to new knowledge, are constantly trained in new processes and in the operation of the latest technologies. As coverage of primary education has expanded rapidly in the developing world, higher education has gained importance. Thus, countries which have invested heavily in creating a well developed infrastructure for tertiary education have reaped enormous benefits in terms of growth.

India’s specific advantage over many other countries is derived from strengths in the more advanced and complex drivers of competitiveness. A fairly young population, large pool of engineers and managers, rising purchasing power, large market and a conducive policy environment for business create an ecosystem conducive to growth. A study of the demographic profile of India forecasts the availability of a population profile of young talent pool over the next 20-30 years. According to the Global competitiveness Report 2013-14, despite all, the advantages that India has an emerging economy, its GGCI ranking is a middling 60 with a score of 4.29 on a scale of 7 and the innovation and the sophistication factor rank is 41. A FICCI – World Bank _ MHRD survey conducted in September – October 2009 reveals that 64% of the employers are not satisfied with the quality of engineering graduates. 75% of engineering graduates are not employable. Only 25% Technical Graduates & 15% Other Graduates are employable in IT Sector – NASSCOM stated by Mckinsey Report 2005. Nearly about 30% of Indian IT graduates are actually employable in the IT Sector, while 25% of the engineering graduates, 15% of finance and accounting professionals and 10% of professionals with any kind of degree are suitable to be employed in multinational companies.

A further extension to these figures is that India also lacks management talent, with a mere 23% employable talent existing in the country (India Labor Report 2007) as per Team Lease Services. Only 26% Engineers for Technology Services & 10% To 15% Graduates for Business Services are Employable given by NASSCOM – Mckinsey Report April 2009. Looking towards the Employability report given by Aspiring Minds 2013, 47% of Graduates are not employable at all; only 36.57% Engineers are employable in IT Operation. A recent report by Confederation of Indian Industry (CII) and Boston Consulting Group (BCG) has estimated that India would face ‘talent gap’ of more than 5 million by 2013 as existing educational institutions do not impart employable skills. World Bank findings suggest that engineering education institutions should: (i) seek to improve the skill set of graduates; (ii) emphasize Soft Skills, (iii) refocus the assessments, teaching-learning process, and curricula away from lower-order thinking skills, such as remembering and understanding towards higher order skills such as analysis and creativity; and (iv) interact more with employers to
understand the particular demand for skills in that region and sector. (World Bank report on Employability-2014). Despite of such a huge repository of available talent, there seems to be a shortage of employable talent as found by industry. With reference to the report given by Associated Chambers of Commerce and Industry of India, while the demand of engineering seats grew significantly, lack of quality teaching, absence of industry collaboration, a slow economic growth rate and excess supply have forced the closure of hundreds of management and engineering institutions in India over past few years. India, despite all its success in the field of IT, is still seen as an off shoring destination. It is yet to fully leverage and exploit its brilliant success in the field of IT and showcase India as a preferred destination for engineering education.

Traditionally, IT firms have achieved economies of scale based on a headcount pyramid model that essentially seeks to increase the base by infusing a steady stream of freshmen engineers. The recruitment teams of these IT companies often looked to the various engineering institutes across the country to fulfill their massive manpower requirements and consciously chose to recruit engineers from various streams, not limiting themselves to only computer science or electronics. The premise was that engineering graduates by virtue of their education will come with the necessary analytical and technical bent of mind which could be further honed and topped with the requisite technology, IT knowledge and soft skills by their respective Learning & Development Teams. This is a golden opportunity for an Industry – Academia partnership where the Indian engineering education sector can partner and give a much needed impetus to help the Indian IT industry take significant strides into higher value added market needs of today’s job scenario.

The employability skills for fresh graduates are identified as an amalgamation of several brains thinking on sound scientific knowledge and principles, applicability and adaptability of the information. Some of the employability skills which the students should have and are a pre-requisite are given in the table below.

![Required Skill Sets](image)

**Figure 1:** Skill Sets required for Employability.
4. Case Study of COEP

The College of Engineering, Pune, fondly called COEP by its alumni, students and faculty, is the third oldest technical institute in Asia. It was started in 1854, and produced alumni like Bharat Ratna Sir M. Visvesvaraya, in whose honour Engineers’ Day is celebrated in India. Prof. Thomas Kailath and Dr. C. K. N. Patel, two eminent engineers from India decorated with the coveted IEEE Medal of Honour and scores of others. However, in a highly competitive world, if the momentum to excel is not maintained, and autonomy is not available to pursue the institution’s own goals, an institute – even one of excellence – can decline. This is what happened at COEP through the decades of the eighties and nineties, and by the year 2000, the institute had only its history to cherish!! (Sahasrabudhe, 2014).

The College of Engineering Pune offers undergraduate programs in 9 disciplines and postgraduate programs in 23 specializations. The Training and Placement cell of COEP was established 35 years ago in the decade of 80 & 90’s on the onset of global companies making Pune a major destination for IT and Automobile industries. This transformation in and across Pune gave a great exposure to COEP also. With its rich heritage and legacy the alumni’s spread worldwide, COEP became one of the preferred recruitment institutions for the IT sector companies.

Figure 2: Showing Employment offers by IT Industries only.

Figure 2: Showing Enrolled V/s Placed – Total Placement
If we look into the Figure 1, in the year 2011-12 around 358 offers were made which shows the IT sector was booming, but in the same year recession started and the effect was seen in the IT hiring of 2012-13. But again after the recession, the economy bounced back and the hiring numbers went up to 546 in 2013-14 and lastly in the current year it was 695 on Day – 1. The Figure 2, shows the total placement data of all the industries i.e. Core and IT together. Here also it is evident that in the year 2011-12 a total of 89% of undergraduates are placed, 2012-13 – 87%, 2013-14 – 80% and then in 2014-15 83% with the placements still in progress. The major chunk of hiring done is in the IT & ITE’s companies is evident from the number of students placed in IT sector and the total employability of the students in those respective years.

COEP understood the need of the hour and started empowering the graduates with the requisite employability skills which will help them in the corporate world. Even while the students are pursuing their graduation, along with the academic skills which definitely count, various add on skills such as spoken and written English, interpersonal skills, the art of communication, situational behavior and many more which play a vital role in helping the student fit into the workplace or corporate were taught. Some measures adopted by COEP to help the students are as follows:

4.1 By remedial teaching bridge courses

1. Summer Term is floated in the institute as per existing COEP norms.
2. Industry Experts who are highly proficient in their own field and working at top-positions in and around Pune are invited to interact with the students and also to take some specific sessions as per need, demand and request of students.
3. As per the results obtained from the above, training sessions are arranged with the help of experts in the respective domains.

4.2 By Soft skills development

Soft skills shape, tone-up, refine, mellow and fine tune a professional to be sophisticated and sharp in his field of specialization. Any professional who has these skills is preferred over a person who lacks these. Precisely speaking, soft skills make an individual or a professional a most sought-after one in his area of expertise. Further, to put in nutshell, soft skills soften a person and to be ready to face challenges of his profession or career. The main objective of finishing course at COEP was to equip students to become strong human resource managers. We all individuals are like ‘Shoes’, the more you polish, more it shines. COEP regularly arranges sessions for students from eminent industry personalities from the recruitment firms like TCS, Cognizant, Accenture etc. for the students development.

4.3 Empanelment of Experts from local Industries who are prospective employers

All the new and sunrise industries like Retail, Insurance, Telecommunications, Nanotechnology, Infrastructure Development, Investment Banking, Logistics firms, Knowledge industry sectors are desperate for good talent and are willing to invest in academics to have job ready talent pool. They are co-adopted as the members in the departmental DUPC – DPPC committees to prepare a curriculum which is Industry ready. Also they regularly visit to teach either an Elective Course which is floated by the Industry or they become a part of teaching process by which they teach a subject of their domain and expertise.
4.4 Implementation of the finishing school training

The major components of any finishing school training are: Leadership, Job Skills Empowerment, Etiquette, Business Communications, Group Dynamics, Business Ethics, Life Values, Essential Know-How, Business Skills, Managerial Skills, Persuasion, Negotiation Skills, Self Esteem, Attitude etc. COEP has designed a special In-House program named EAGLE i.e. Energized Accelerated Growth for Leadership Excellence for the students. The entire programme comprises of three stages; Nurturing stage, Learning to Fly stage and Soaring stage. The programme is going to touch the lives of 700 plus students in a positive way for life. This is the “first of its kind” program in the country launched in association and fully supported by Industry. The main contributors are TCE Ltd., Thermax Ltd., Kirloskar Brothers Limited, KND Engineers, and TATA Trust. The programme was closely and meticulously monitored through software LEAP which was developed in house by COEP faculty. The LEAP gives lot of analytics on progress of individual students and the group, both monthly progress and overall cumulative progress, thus making the graduates a hot property in the job market.

4.5 Interviews of weaker students completing their finishing school trainings for employment

People are like diamonds. Their basic value multiplies a hundred fold when they are polished. Today’s youth needs to be groomed for challenges of real life world. Finishing Schools Education seeks to fill this vacuum. We live in a global village, we need to shape up to global benchmarks and equate ourselves with enlightened people all over the world. COEP has conducted the mock assessment test for the students every year through the professional organization who are also hired by the industries for their recruitment process. Every year Assessment test of AMCAT for recruitment is conducted for all the students appearing for the placement (twice). Also mock interviews are conducted by inviting some professionals, mirroring a scenario of actual campus interviews. Those students who are found to be weak are given special coaching and attention in the areas where they lack.

4.6 Training of students through Simulator software for enhancing interview skills

Industry surveys and our past experiences consistently prove one thing - even the best technically trained candidates fail to demonstrate their abilities in rapid, spontaneous real-life situations. The institute has procured a Simulator Software for students. With this simulator, students can attend any number of realistic, customized job interviews, well before the real interview. Its training module helps students practice any number of interviews with sample answers, guides advices, etc. regarding the finishing school, to train them for the actual interview conducted by the several companies as part of recruitment process.

Apart from all these activities initiated by COEP there are around 32 clubs ranging from History to Astronomy, to Culture, Philosophy etc. being run in for the different student activities. These clubs are managed by the students, for the students and are full of different student activities throughout their academic career. These activities teach the students several soft skills like team work, group management, leadership etc. required in the real industrial world.

With these initiatives COEP can boast of producing a good number of employable graduates with special attraction to the IT sector industries who are inclined more towards these skills.
as the clientele for these companies are international and the industry wish to hire the graduates with ready employability skills, giving emphasis on the add on skills apart from their academic skills. COEP has made a policy to start the Day Sharing with the major IT recruiters who offers the jobs to the engineering graduates with big numbers. This was promoted as Day – 1 Sharing slot where the major players of IT sector participated and hired the graduates for our institute. The process was done in a time span of 8 to 10 days and the results are kept in sealed envelopes for giving a fair chance to each company willing to recruit. This also helped the students to get an opportunity to select the best IT company as per their wish and make a major decision which is their first step towards the real industrial world. The offers made by the companies on this platform showed a tremendous job generation for the engineering graduates of COEP.

Apart from job generation, the Industries wishing to join hands with COEP for mutually beneficial fruits have also increased. This is evident from the Figure 4 which shows the increasing numbers of MOU’s signed by COEP, where industries are also willing to collaborate in areas of research, sponsorship, industrial projects, consultancies etc. This had also direct effect/impact on the number of companies visiting COEP for campus hiring. The number has also increased because of the exposure and linkages of COEP with industries as shown in Figure 3.

![Company Visiting COEP for Hiring](image)

**Figure 3:** Showing Visits of the companies visiting COEP for engineering graduate hiring.

5. Conclusion

The profiles of the career opportunities keep dynamically changing as newer and newer technologies emerge and the global market requirements change. The formal education focuses on the fundamentals, concepts in different subjects and brings out with excellent basics and strong foundation over which the super structure could be built. But we should provide skills both technical and soft skills to students and facilitate their employability and play a role in empowering employable India.
Figure 4: Showing the MOU’s signed with Industry and Institute in last 3 Years.

The present best practices adopted by COEP can lead to a lot of changes in the way the process of campus recruitment is being handled in the country. If the practices discussed in the paper are practiced, this will definitely make a positive difference in the employability amongst the student community. The present day, engineering education and the engineering institutes have to play a crucial role in preparing a ecosystem where students develop self awareness and is made are of the transition from college to corporate with the equal participation of the industries which will help to ease the process of transition. More industry – academia interactions, sponsorship of laboratories, joint research and consultancies and student projects will generate more employable graduates and give higher opportunities of employability in the line of industry expectations. In case of COEP, it has bagged the CII Award for best Industry – Institute Academia Relationship and also the case history of the success of COEP in placements is published on the portal of AICTE.

6. References


