

## Conceptual Investigation to Bridge The Industry- Academia Skill Gap With Respect To Engineering Graduates In India From IT / ITES Industry Perspective

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### Abstract

Indian IT industry has a major footprint globally and is contributing substantially to Indian economy. To cope up with the global challenge of skill and capacity availability, Indian IT industry is looking up for “ready-to-deploy” skills. Due to growing competition, there is huge cost pressure on the IT industry and hence industry is largely dependent on graduate / post graduate fresher talent. To achieve this, there is large dependency on how industry and academics are connected to work jointly to meet the goal of onboarding “ready-to-deploy” talent. Industry needs to work closely with academics by means of spelling out the skills which they expect from fresher talent as well as work with academics to share their practical knowledge and experience. As per UGC data as of February 2017, India had 789 universities, 37,204 colleges and 11,443 stand-alone institutions which is highest in the world in terms of number of education institutes. Survey conducted by NASSCOM in 2011 showcased that 75% of IT graduates are not employed. Considering the issue faced by today's engineering fresher, this paper aims at highlighting current and future initiatives to bridge the gaps between academics and industry by means of research and development driving governance of academics with special focus on engineering colleges, developing centre of excellence which will help academicians to cope up with changing needs of the industry..

**Keywords:** Engineering Students, College Graduates, Literature Review, Investigation Report, IT Industry

### 1. Introduction

The overall un-employment of graduates is turning out to be a big issue in today's scenario in India. Few years back the issue was limited to graduates who have done their basic education in Arts, Commerce or Science but now this has widened to even the engineering graduates. Problem has further enhanced to even the management post graduates [1]. There is a need to evaluate the issue systematically to understand the factors which may be impacting for engineering graduates to find a suitable job.

When engineering freshers pass out of college after putting hard work across four years of education and in many cases completing this in adverse financial family conditions just with a hope to do a career which will help him / her to establish and excel in their life. It becomes very difficult for engineering graduates to understand and digest the fact that they lack the skills required by the industry [2]. Since globalization, India is playing key role in providing information technology related services globally [3]. Today skill requirement is changing so rapidly that employees need to cope up with the market needs and hence need to work on upskilling throughout their professional career to make sure they are competitive enough to sustain and grow. India produces one of the highest calibre graduates having great ability in computer / IT area amongst the world after China and USA as far as enrolment is concerned and is at third position in education provisioning [4], [5]. As per UGC data as

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In Indian market Employability has emerged as a major element and it has now become the most common topic of discussion. It is thorny to define Employability but, in general way it refers to our chances of getting employment [6]. Employability skills may be broadly defined as a set of basic academic, personal and teamwork skills that industry expect from their members/employees, that are expected to be developed/instilled in employees by educational system. [7]

## **2. Gap between Industry and Academics:**

Considering the dynamics of skill and capacity requirement, industry is struggling to predict / forecast the needs. Technological changes are driving all industrial sectors to be on their toes to cope up and survive [8]. As industrial changes are dynamic at the same time Indian academic system is more static in nature. Adapting to change in syllabus is taking much longer time resulting in the gaps in what industry need and what the knowledge level of the graduate pass out. [7], [9].

When we consider limitations at academics, though there are huge number of colleges, but at the same time there are many applicants who are applying and there is certainly mismatch in demand and supply. Overall requirement increases only when there is new course inducted at college or increased capacity is approved or there is a new college which is opened. In most of the other cases, there is overall static demand but at the same time number of qualified pass outs is increasing and hence availability is increasing substantially. When we look at different colleges and universities, it is observed that private colleges and universities have control on deciding / changing their curriculum whereas all other universities / colleges are dependent on changes to be dictated centrally which results in substantial lead time and hence capability development of students is not aligned to market needs in most of the cases. At the same time Industry is also struggling to forecast and provide visibility which can help academicians to prepare and develop the required capability. Industry is undergoing substantial cost pressure and need of out-of-box thinking and they are very much reliant on academicians to develop this capability. Technical capabilities are very much in high demand and are becoming crucial for knowledge-based industry. Overlook of academics needs to change and should be aligned to market needs in order to develop right skilled capacity from graduation level itself for which there needs to be strong collaboration between academics and industry.

## **3. When we try to evaluate the reasons for this gap:**

- Industry has poor capability to predict required capacity and capability which can be used by academics for forward planning.
- Industry requirements are of dynamic in nature [8] and are revised frequently whereas academic syllabus is static.
- Academicians has limited industry exposure / experience.
- Erstwhile approach of “Internship” or “sandwich” course no more exists or effectively implemented.
- Industry resources bandwidth availability to work with academics in pro-active manner.

## **4. Engineering education in India:**

There are about 10345 engineering colleges in India which are affiliated to All India Council of Technical Education (AICTE). Around 1.5 million engineers are passed out every year across different streams in India. We can categorize these engineering colleges as below:

- Tier-1 – All top IIT’s and NIT’s across the country
- Tier-2 - Top ranked private institutions / colleges and all state sponsored government colleges
- Tier-3 – Remaining private colleges not into any of the above category.

The presence of Tier-1 institutes is limited and is directly controlled by the government whereas Tier-2 and Tier-3 institutes contributes largely in overall institution number. Hence overall number of engineering freshers pass out from Tier-2 or Tier-3 colleges large. It has been evident that the quality of the skills acquired by students passing out from respective Tier College differs drastically and that directly results into employability [10]. In past few years it is noticed that there are very few core engineering jobs available and most of the opportunities are in Information Technology (IT) or Information Technology Enabled Services (ITeS). Hence invariably it is noticed that most of the engineering graduates land up in taking up job in IT / ITeS companies could be as a preference or out of no options.

## Conceptual Investigation to Bridge The Industry- Academia Skill Gap With Respect To Engineering Graduates In India From IT / ITES Industry Perspective

In today's situation when students are expected to have practical knowledge and understanding but Indian curriculum focuses more on theoretical approach. The current education system has limitations in designing the curriculum for this course. When we review the curriculum, it is noticed industry does not need students to put efforts / focus on some of the subjects. There are limited colleges / institutes who provide options of "Elective" subjects which can allow students to pursue subjects of their interest. Earlier, the quality of engineering colleges was good since only select few institutions / colleges were permitted to provide associated courses [11].

As colleges / institutes were limited, in-take criteria were stringent and resulted in select quality of students getting admission. Since the engineering colleges' number increased rapidly predominantly in Tier-2 and Tier-3 categories, the outcome of the student's capability deteriorated. If Indian education system could manage to maintain the quality of education by means of infrastructure and skilled academicians, then perhaps output from these colleges would have been completely different than what we see today. AICTE has little or no control once they provide approval to private college. Current education system structure validates the quality just based on exam score. Technology is changing so rapidly but the curriculum is more like static and is not coping up with industry needs.

### 5. Engineering graduates in IT / ITES Industry:

Today, maximum intake of engineering graduates is in IT / ITES industry in India. There is substantial gap between demand and supply of engineering graduates and the requirement in IT / ITES industry. It is observed that in India, Engineering graduate students across branches wants to pursue their career in IT / ITES companies, there are select few who would like to focus on their core branch. In India, job opportunities in core field are limited as compared to number of students passed out every year. Even after having million engineering graduates passing out every year, Indian industry is struggling to identify right talent as per Aon's study report titled "Not Just an Employability Report" [12] [13].

As per annual employability survey 2019 by aspiring minds, about 80% of engineering graduates are not fit for any job in knowledge economy. As per the survey there seems no change over past 9 years in the employability capabilities of Indian engineering graduates. Survey has identified the need of systematic change in overall education system. Survey identifies that Indian engineering graduate lack core technological skills (like data science, artificial intelligence, data engineering, and wireless) which is the need of the time for the industry. Survey further identifies that Indian engineering education more theoretical where only 40% of the students do their internship while 36% of the students do the projects beyond their coursework. Students have very little industrial exposure, about 47% of students attend industrial talks while 60% of the faculty do not discuss industrial applications of the concepts. Indian engineering students lack counselling and guidance. Coding abilities of Indian graduates is far less than US engineering graduates while Indian and Chinese engineering graduates are competing closely in terms of percentage.

Indian IT / ITES industry has built up another parallel education system wherein engineering graduates after joining undergoes structured training program. Organizations like Wipro, Infosys and many others have developed their internal learning and development team who are responsible to train / coach these freshers before they are deployed on the projects. Most of the training programs as part of induction of freshers in the organization are focused on developing basic programming skills and soft skills. [14] On an average industry spends 3 months per resource to train and onboard before they are deployed on the project which results in substantial cost. At the same time these are the skills can be developed for the students easily during their education term.

### 6. Industry Viewpoint:

Since there is little or no improvement in employability over past several years, various aspects of overall system need to be looked at

- Improvement in Areas of Engineering education:
  - Student should have more practical exposure than just a theory, internship approach.
  - Institutes / colleges should focus on employability skills right from the Year-1, there should be continuous assessment.
  - Students should be encouraged for research and development.
- Curriculum and Syllabus upgrade:
  - Curriculum / syllabus should have equal stress on theory as well as practical.
  - Elective options to be provided.

- Faculty:

- Capacity to be developed amongst faculty for the latest technology skills by faculty development programs.

### 7. Challenges:

Unemployment or not getting the job suitable for their education has become a major issue for engineering graduates. India government has taken various initiatives to improve in quality of education but still it does not suffice the need and there has been no visible change in the employability ratio over last several years.

### 8. Key challenges faced by Indian Engineering students / system:

- Lack of industry / academics connect: With few exceptions of private universities, there is no or limited connect between industry and academics, this is largely impacting the gap in what industry needs.

- Syllabus / Curriculum not aligned with what industry needs: Curriculum is more of static in nature and any changes takes long time to implement.

- More stress on theory as compared to practice: Today most of the concepts / learnings is purely based on Today education system lack practicality. Curriculum also covers only theoretical aspects and lacks providing details on practical implementation of concepts.

- Evaluation / Examination: Today our system is evaluating talent purely based on theoretical concepts, typically students who can mug up can score well. Students are just focused on their scores rather than trying to understand the concept and its practicality. This results in weak fundamentals / basics.

### 9. Recommendations:

1. Establish joint governance across technical education board, industry experts and academicians to define, execute and monitor common program which will encompass across curriculum definition, building state of art skill-set capability amongst academicians and ways to provide practical exposure to students.

2. Jointly working with industry

- a. Provide internship to students which will provide practical exposure.

- b. Industry linked research project sponsorship

- c. Industry to provide platform for academic research into commercial space.

3. Establishing specialized technology centres for

- a. Provide quality training and skill development.

- b. Focused approach to align with industrial trends.

- c. Provide platform for students for research.

- d. Tie-up with other global universities for exchange program

4. Focused training program to students aiming employability as a goal.

- a. Providing elective options to students to decide their career aspirations.

- b. Coaching / Mentoring students right from Day-1 for industry required skills.

- c. Connecting students with industry experts

### 10. Conclusion:

Today IT / ITES industry globally is under tremendous pressure to deliver high quality products / services at most competitive cost. To achieve this, industry has large dependency on human capital. Industry always needs to make a right mix of experienced and fresh talent to make sure right quality of services are delivered. To achieve cost competitiveness, industry is largely dependent on fresher talent to be onboarded and deploy on projects as early as possible. Though industry is struggling to identify and onboard right talent, they have worked on adapting to specific recruitment approach which can help to identify right / close match to their needs. Industry has further developed their own training platform which is used to train all freshers before they are deployed on the projects. Over the period gap between industry and academics is widening as industry dynamics are changing rapidly. To overcome the challenge industry and academics need to work together and

## Conceptual Investigation to Bridge The Industry- Academia Skill Gap With Respect To Engineering Graduates In India From IT / ITES Industry Perspective

work jointly on the issue of what industry needs and what academics can achieve within our education system framework

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