Sustainability of Engineering Education In India

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***Abstract* - Now it's a trend and everybody is acquainted with the terms like, skill India, Digital India, Make in India, hence the author tries to find out real situation of where we stand. Because all the said terms are associated directly or indirectly with the engineering activities, this paper tries to examine whether present trend of engineering educational structure and policies are in favor of engineering students or not. What is the sustainability of the engineering education at present market scenario? For examining the facts the researcher has gone through an extensive study of recent recruitment trends since last ten years. Further specifically the concentration on the changes in recruitments or hiring process of different industries as on February 2016 as compared to the base year February 2015. The micro analysis is on the hiring process in prospective for the engineers in India. The data collected are represented in both tabulated forms as well as graphical forms. Simple correlations between the different variables are the basic of analysis. The paper concludes that the Indian engineering job Market is going through a process of high level metamorphosis and the policy makers along with the institutions and students has to think seriously before it became a cancer in your technical educational system.**

***Keywords* - Make in India, Digital India, Skill India, Sustainability**

I.OBJECTIVE OF THE RESEARCH

The objective of the research is to find out the concurrent trends of hiring in different industries in India with reference to prospective for engineers. Also to find out the factors which make the engineering job market more complex and volatile and how to come out with a best solution from this situation to achieve a sustainable engineering education.
The further objective is to find analyze the impact of current educational standard of the engineering students on the sustainability of engineering education in India.

II.INTRODUCTION

Background of The Study

Shri Pranab Mukherjee, The President of India, inaugurated the India Skills Competition **-'India Skills-2016'** on 15th July, 2016 in New Delhi on the occasion of the World Youth Skills Day and today we are for discussion on Engineer's day on 15th September 2016 are here to discuss on the sustainability of engineering education in India. Mr. President on that occasion said that "India is a young nation with 62% of its population in the working age group and more than 54% of the total population below 25 years of age. As a consequence, around 15 million youth enter the workforce each year. Young minds are our assets. This is our demographic dividend which we need to harness. As policy makers, we have a duty to empower our youth by providing skills to them. We need to seize this opportunity. He cautioned however, that if we cannot provide jobs to the huge number of people entering the job market every year, the population dividend could turn into a **population liability**. This explosive situation has to be prevented".

Growth Of Engineering Institutions And The Enrolments In India

Table 3: Engineering Institutions in India

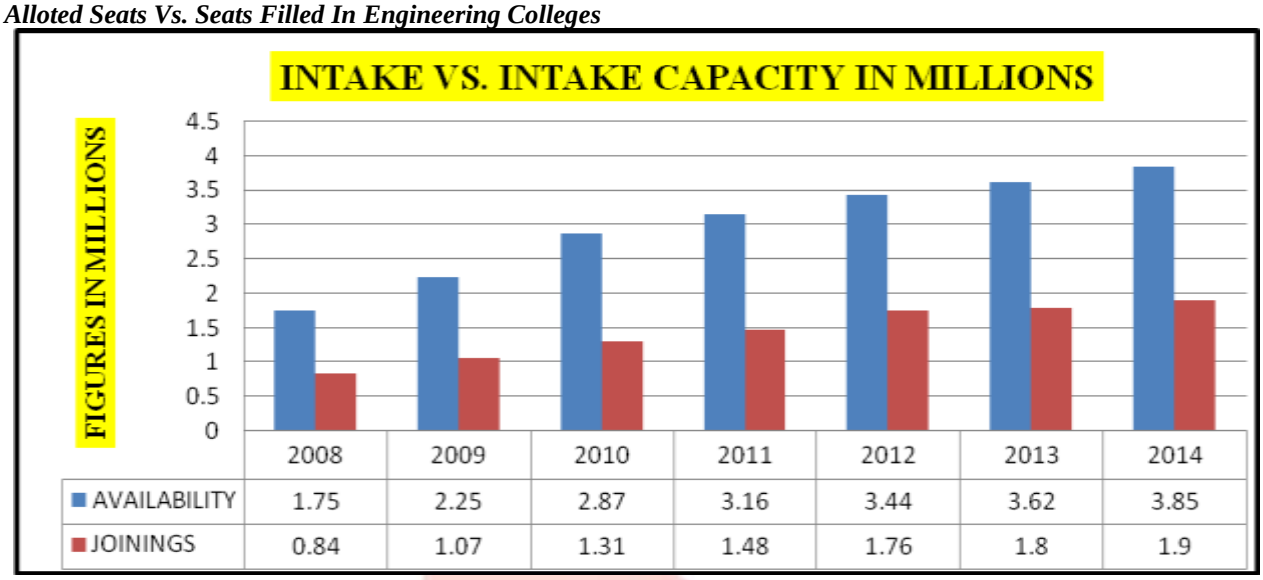
YEAR	NUMBER OF INSTITUTIONS	% GROWTH OF NUMBER OF INSTITUTIONS	TOTAL INTAKE SEATS (MILLIONS)	% GROWTH OF TOTAL INTAKE SEATS	TOTAL STUDENT INTAKE (MILLIONS)	% GROWTH OF TOTAL STUDENT INTAKE
2008-09	2,388	30%	1.75	25%	0.84	23%
2009-10	2,972	20%	2.25	22%	1.07	21%
2010-11	3,222	8%	2.87	22%	1.31	18%
2011-12	3,393	5%	3.16	9%	1.48	11%
2012-13	3,495	3%	3.44	8%	1.76	16%
2013-14	3,887	10%	3.62	5%	1.80	2%
2014-15	4,276	9%	3.85	6%	1.90	5%

Source: All India Council for Technical Education, Approval Process Handbook (2015-2016)

Table No: 1.

In the above Table no 1, data depicts how the numbers of institutions are increased year over year for seven conjugative years from 2008 to 2014. It also highlights on the percentile growth in number of institutions. In these seven years the number of institutions has been increased from 2388 in 2008 to 4276 in 2014, which is almost double in seven years. In short we can say that there is a 100% growth in the number of institutions. Along with the number of institutions the intake capacity or number of seats also increased at rate of more than double from 1.75 Million in 2008 to 3.85 Million in 2014.
The same trend also prevails in intake or joining of candidates i.e. 84 Millions in 2008 which is increased to 1.90 Million in 2014.

Total Alloted Seats Vs. Seats Filled In Engineering Colleges



	2008	2009	2010	2011	2012	2013	2014
AVAILABILITY	1.75	2.25	2.87	3.16	3.44	3.62	3.85
JOININGS	0.84	1.07	1.31	1.48	1.76	1.8	1.9

Figure: 1 (Source: AICTE)

Percentage Of Intake Vs. Total Intake Capacity

Figure: 2 (Source: AICTE)

Figure number 1 and Figure number 2 shows that boom in the demand of the engineering professionals in Indian market made the increase in number of institutions at rate of 30% in the year 2008 as compared to the previous year, which is supported by 23 % growth in admissions in to the course. As per the percentage wise it can be said that the percentage of growth in number of institutions was in proportional to percentage of growth in admissions, but if we calculate the percentage of seats being filled are mere 49.35%.
The same situation continued for the year 2009, the growth in number of institutions was 20% and the growth in admission was 21% but the percentage of seats filled was 49.72%.
From the year 2011 hence forth the pace of increase in the institutions slow downed and remained somewhere between 3 to 10% and the rate of increase in the admissions also slow downed and remained between 2 to 18%. But the numbers of seats being filled remained to its past figure i.e. around 50%.

III. Engineer's National Employability In India

Less than 20% engineers are employable for software jobs, 7.49% are employable for core engineering jobs, even though more than 90% aspire for such jobs. Of the six hundred thousand engineers that graduate annually, only 18.43% of them are employable for the Software Engineer-IT services role, while a dismal 3.95% are appropriately trained to be directly deployed on

projects. For core jobs in mechanical, electronics/electrical and civil engineering only a mere 7.49% are employable. In contrast, 53% engineers have software role as the most preferred job, whereas 44% prefer core engineering jobs. This means 97% engineers want jobs either in software or core engineering.

IV. REASONS FOR INSTABILITY IN JOB MARKET

Firstly, an economy with a large percent of unemployable qualified candidates is not only inefficient, but socially unstable.
Secondly, there is a large mismatch in the aspirations of graduating engineers and their job readiness, which can create large-scale dissatisfaction and disillusionment.
Whereas employability varies drastically by location and tier of campuses, 70% of employable pool in lesser known colleges is being missed by corporations, these are as follows.

- Employability varies tremendously across colleges.

For instance, colleges in tier 1 cities have 18.26% employable software engineers, whereas for those in tier 2 cities, it goes down to 14.17%. Similarly, the states at the top have employability as high as 40.42%; those at the bottom have it at 12.03%.

- Lack of adequate domain knowledge key reason for low employability in core job roles in both software and non-software domains:

Employability of Computer/IT engineers in Software Engineer is a meager 3.21% while it is 7.49% for design engineer

- Very few engineers want to work for startups:

Only around 6% of engineers have startup companies as their first job preference.

Hiring Trend In Different Industries In India As On Feb 2016

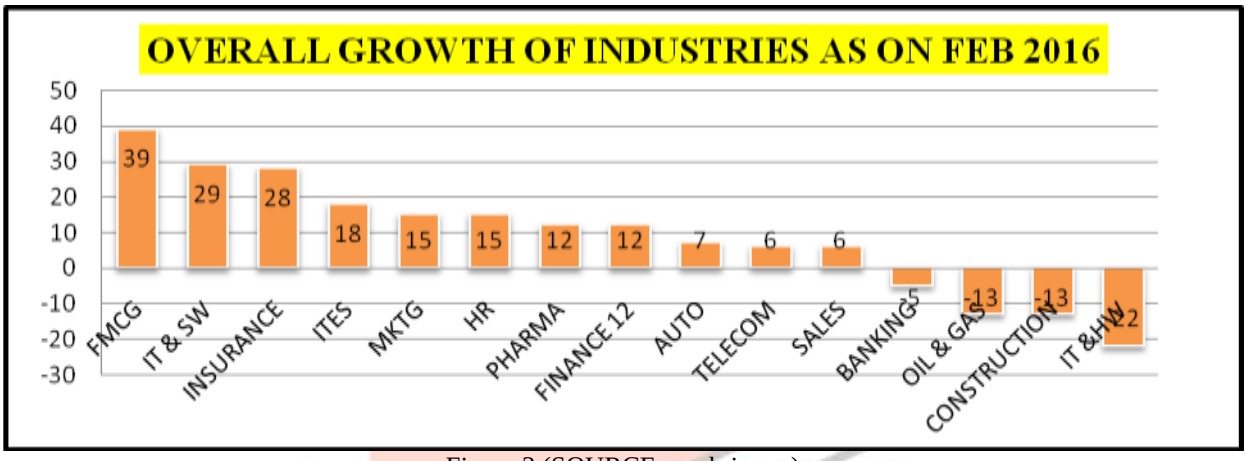


Figure 3 (SOURCE: naukri.com)

Hiring Trends In Engineering Specific Industries

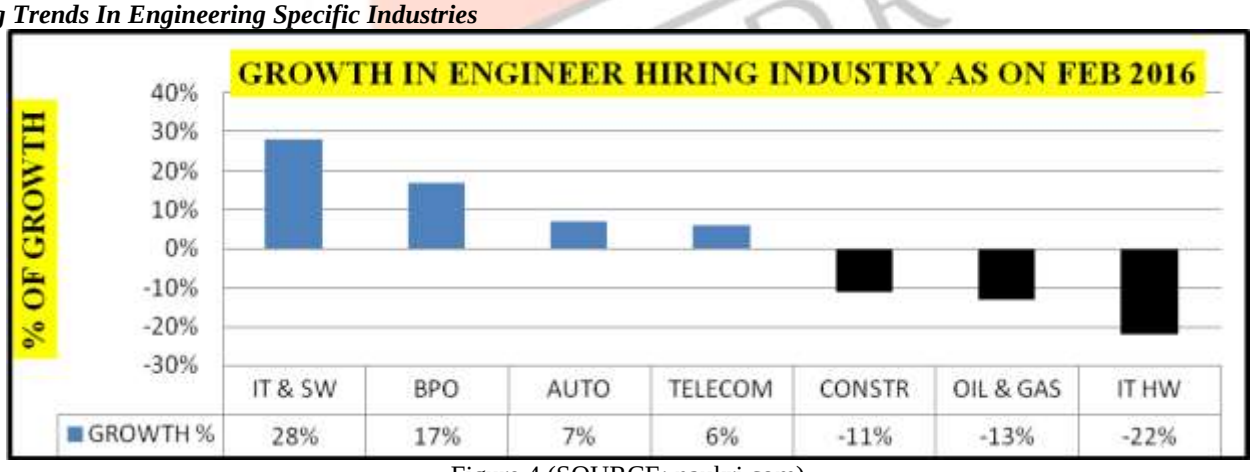


Figure 4 (SOURCE: naukri.com)

Abbreviations: *FMCG (Fast Moving Consumer Goods), IT (Information & Technology), PH & BT (Pharmaceuticals & Bio-Technology), AUTO (Automobiles), TELE (Telecommunication), ITES (Information Technology & Enabled Services), HR (Human Resource), HW (Hard Ware)*

V. REMARKS

FMCG recorded a growth of 39%, followed by IT & SW sector 29%, Insurance 28%, ITES 18%, Marketing and HR jobs tie ups at 15 % each, Pharma & Finance tie ups at 12% each, Automobile 7%, telecom and sales tie ups at least with 6% . The above industries have shown a positive response to the hiring trends. While FMCG, IT & SW and Insurance were really in a very good mood to hire as on February 2016 in comparison to February 2015. While the other industries like ITES, Marketing, HR, Pharma

and Financial sectors are more not very good, but in a good mode to hire. And lastly the other three industries like Automobile, Telecom and Sales managed to hire. But the other three industries i.e. Banking, Oil & Gas and construction has shown a affective negative growth in hiring. Last but not the least the worst performing industry was IT&HW which has shown a negative growth of -22%.

The above figure shows that the scopes for IT & SW engineers are good and there is an expectation that the industry will grow further as the industry shows a growth of 29% up in hiring activities. But it was disheartening for those who are associated with the IT Hardware process as the industry has shown a drastically reduction in its hiring activities. Out of many reasons the slowdown in sale of desktop PCs. Along with IT& HW the engineers associated with construction and Oil & Gas the period was also tough to get haired. For automobile engineers they have to compete hard for each single job. For Electronic & Telecommunication the scope for their core company is also quite tough so they can manage somewhere between IT&SW and Telecom.

VI. REMEDIAL ACTIONS

- **Try making a balance between the job openings and number of pass outs.** There are only so many new jobs being created every year. The number of new engineers is far higher.
- **Increase the exposure**. Most Indian engineering colleges provide no or very bad internship opportunities. Most engineers have no clue what the industry actually is like.
- **Updated syllabus as per present or future demand:** the traditional syllabus is easy to follow so the board or university is not going for hectic syllabus restructuring.
- **Enhancement of knowledge**. Very few engineers actually know *anything* about their field. Indian engineering college rewards rote learning, not knowledge. Why *should* someone hire these engineers?
- **Self motivation:**. Most Indian engineering students are incapable of working on motivation, they need strict guidelines.
- **Make them discipline and focused**. No employer has the patience to ensure there is always a carrot on the stick to keep you focused.
- **Managing Attitude:** They must be taught what shall be the proper attitude in the workforce.
- **Skill enhancement:** being an engineer one shall have the skill, ability and confidence to work in group or independently.
- **Demand supply:** There are nearly 4300 colleges across India. All producing 15 lakh engineers per year but for every single job 400 members are competing. The ratio increases every year due to the previous year unemployed.
- **Updated syllabus:** The technology is changing drastically but the syllabus of colleges is not changing linearly with present technology .So how can engineers survive and compete with people with 10 year old syllabus.

VII. CONCLUSION

Idea of discussion is to make the engineering education sustainable in the present market situation. This can be done by raising skills, qualities and confidence which in return can improve the situation of employability of engineering students. The status of Productivity as a whole can be improved by providing proper direction for skill development. Growth in the entire sector including, education, training and skilled programme should be balanced as per the availability and hiring trends in the job market. The dignity of all the jobs should be maintained so that the discrimination between the jobs shall be minimized. To meet the need and to fulfill human capital corporate educational institutions, non-government organizations, Government, Academic Institutions and Society would help in the development of skill of the youth for better results in shortest possible time. With the help of skill development, India can definitely move forward towards economic sustainability of engineering education.