Current Status of Engineering Graduates and Employability

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*Abstract:-*Engineering is the application of science and technology in order to design, build and maintain structure, machine, and device. India is a unique position where it has developed a reasonable infrastructure in engineering and technology in some of the fields. The new challenges for engineering education go more than the need to keep students abreast of cutting edge technology and calls for a better equilibrium in the various areas of engineering. This requires the new development model for the holistic growth of engineering education. Adaptation of new development model will not be easy since lots of our research universities are faced with monetary pressures. Indian government has made significant contribution toward this growth phase for the development of nation. This paper addresses for an assessment study of the methods developed by reputed engineering institutions in India to lay the foundation for future engineering education.

Keywords:- Cloud Computing, Certification,E-Portfolio, etc

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I. INTRODUCTION

The exponential rise in the number of engineering institutions in the last two decades in India has facilitated the entry of aspiring students into engineering institutions and provided the much needed manpower for industries. But the quality of education in most of these institutes remains questionable.In recent years, Indian economy has grown rapidly interestingly, by skipping the manufacturing stage and going straight to the services sector, the country took a rather unconventional, path to growth. This resulted is a surge in demand for graduated in certain areas taking the higher education sector by surprise. Unable to meet this demand, technical and higher education these shortages were accompanied with rising graduate unemployment and underemployment. Changing nature of work and growing integration of Labour markets at the global level makes the coordination between higher education and Labour.

Market complex. Presently there is so many number of Engineering Colleges, Polytechnic Colleges in India. All these should have augmented the pace of industrial development. Instead, the institutes are producing persons who fall much short of desired expectations of the industries. In other side the industries are on a look out for persons who technically equipped, possess managerial skills, are creative, and can easily adapt to the changing market situations. India does not have a problem of supply of graduates; the problem lies in the uneven quality of graduate and skill mismatch and small number of people with rapid economic growth, investment boom and accompanying structural changes, the situation had aggravated in certain segments, bringing focus on higher education and skill development in recent years[1][2].

II. REASON OF UNEMPLOYMENT

One of the reason for the unemployment among engineers are education system in some colleges are not up to the standard.

FirstlyEngineering has become one of the most popular degree which is under demand by most of the middle class people of India. Some colleges are not equipped with proper lab facilities and some colleges may suffer without proper lecturers. This is one of the major reasons for unemployment.

Second, the parent pressure plays a vital role. Most of the parents want their children to become a doctor, engineer so they put in a lot of pressure among their kids. They force them to do something which is not they are actually capable off or something in which they are not interested in.

Third reason is the lack of entrance examinations. Many students join the engineering college without facing any entrance examination. This is one of the major reasons where students who join like this may lack in basics. Like some students may not be very good in mathematics, physics, English etc which lay the foundation to become a good engineer.

III. TECHNICAL ANALYSIS

Students do learn or Design and Develop a new Software's and Programs in the college as per their syllabus. Most of the students understand the design aspects and know theory behind it. However, when it comes to designing practical applications, it is found that almost 63 percent of the students cannot design and build practical application due to lack of practical knowledge. Approximately 32 percent of the students do design and build the applications, but they are not able to debug the system and find the problem when application does not work as per the expectation. The root cause of this lack of practical knowledge is due to the theoretical approach of learning. The academic syllabus aims at teaching the theory part. The practical sessions conducted in the labs are mostly on the Kits which hides most of the design parts from students [3].

IV. NEED OF TODAYS

Technology has become the key factor in deciding the course of development of any nation, there is a need to encourage technology up-gradation of the industries, therefore enhancing the research potential of the industries. All the inventions and innovations, stem out from the developed nations, which is a result of tremendous effort that they put in R & D. Thus R & D facilities have to promote in the industries. In recent years, survival initiatives have been taken to bridge the gap. Industry specific and context specific solution is being tried in many sectors. Experience has shown that private institutions are for more adaptable and non-formal provision is better in responding to the students' demand. Thus, a suitable mix of the public

and the private , the formal and the non-formal provision for higher education and training provides , an optimal solution and would meet the changing needs of economy and society. Engineering firms need to get serious on practical Engineering graduates, we're told, may have learnt the theory but too often lack the practical skills that make them employable.Globalization becomes part of the "everyday", there will be an increasing need for engineering systems to provide global solutions to global problems [4].

V. EXISTING PROBLEM STATEMENT

- **Outdated learning** – learning basics is one thing, but learning ancient programming languages, for example, FORTRAN, and not staying in touch with the industry could be one reason why engineering students are not relevant to today's industry.
- **Theory vs Practice** – The current education system poses a chasm between theory and practice. Very little of what is learnt at college can be put into practice in everyday life. Hence, the best performers of the system, which are the kids with the best grades, actually can do very little work and need to be separately trained for it. That's an expense that not everyone in the industry wants to take.
- **Exam culture** – Learning is a continual process, and exams are a way to measure the extent of your learning. It is not the end all. Unfortunately, the CGPA or grade of a graduate is the first filter for employment, and hence students lay emphasis on only the exam and not on learning the subject. This results in weak fundamentals, and hence, industry irrelevance.
- **Lack of exposure** – Given that the end goal of technical education is a placement in a college, the amount of exposure given to students about the industry is also very little. It is not until the final year of their college that they begin to understand what the industry really wants. An early exposure to industry can give students an idea of what is relevant in the industry, which they can learn in their own time.
- **Bad career matching** – Over the years, the lucrative opportunities that a professional life in the technology industry has provided, has made engineering sciences the de-facto choice for graduate studies. Whether or not the student has the aptitude for the stream is not taken into account, resulting in uninterested engineering candidates, who haven't taken to their subjects as much as they should have, making them irrelevant to the industry.

VI. PROBLEM STATEMENT

The problem in our education system is designed for those who wish to pursue engineering studies in technical institutions. Engineering is under technical domain hence mainly concentration on building technical skill. But most colleges does not meet industry requirement or skill development. So that students either drop out. We thus spend huge amount on producing a large number of

unemployable youth who hold university degrees. They are not educated unemployed, but unemployable graduates.

VII. EXISTING SYSTEM

In the lack of proper direction, parents and their wards follow wrong methods while opting for branch of study in the college. During counseling, it is seen that the choice of a branch of study is based on the various myths.

This lack of practical knowledge causes following problems to the students:

- Students are not able to design and develop their academic projects.
- Students are not able to face interview questions that are aimed to extract practical knowledge student has got.
- After joining the industry as a fresher, students can't perform as they are not able to work on practical platform In order to aim such problems

VIII. EXISTING SITUATION OF ENGINEERING EDUCATION IN INDIA AND CHALLENGES

India has huge potential of the youth power which is now being engaged in higher education including engineering. The resulting quality of the engineering graduates does not fully satisfy the requirements of the global market. Self-financing private engineering colleges are producing about 86% of the engineering students in the country. The poor quality of the graduation is due to the following reasons:

- Poor physical infrastructure.
- Lack of faculty
- Poor learner quality.
- Absent R & D activities.
- Poor quality of training.
- Ineffective linkage with industry.
- Poor gender ratio.
- Shortage of quality faculty.
- Rigid and outdated curriculum.

IX. PROBLEMS BEFORE THE ENGINEERS, NEWDEVELOPMENTS IN ENGINEERING EDUCATION

According to the Canadian Academy of Engineering,Engineering is a profession concerned with the creation of newand improved systems, processes and products to serve humanneeds. The central focus of Engineering is design and that:

1. Engineering graduates should be broadly educated andtechnically sound in their respective disciplines of study.They should be knowledgeable about the society in whichthey live.
2. Leaders of Engineering faculties should ensure that theirfaculty members have the qualities – educationalbackground and training, vision, ethics, needed for theirpromising role in preparing undergraduate and graduatestudents, who would be able to work effectively in ourrapidly changing world.
3. The original creative work done in Engineering facultiesnamely research and design, should be

characterized byexcellence, by relevance to industrial and social issuesand by concern for the life of preparation of the graduatestudents involved.

X. IMPLEMENT PROPOSED SKILL BASED METHODOLOGY

The specific skills can be grouped into three overall groups of skills: Core Employability Skills, Communication Skills, and Professional Skills. Core EmployabilitySkills and Communication Skills (Soft Skills) are more important than ProfessionalSkills. Soft skills, such as reliability and self-motivated have the largest skillsgaps.

XI. PROPOSED SYSTEM

- International Certification: That helps in enhancing Skills and Build Confidence to do the practical.
- Certificate: That helps in adding extra points to your resume and fetching a good job opportunity.
- Practical Learning: Students acquire practical knowledge hence can design their own projects, can face interview in a better way, and can prove their talent after joining a company.
- Competitions: As the practical knowledge has been gained, students can participate in the various competitions, win prizes and add up extra things to their resume
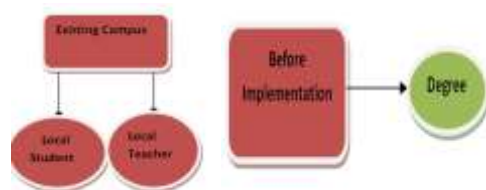
EXISTING CAMPUS

Fig 1 Existing Campus

XII. NEW DEVELOPMENT MODEL

Fig.2 shows the higher education quality factors involved for thedevelopment of engineering education. Engineering students should first need to be educated in accordancewith an engineering-education development model for holistic development. The new development modelcalls for engineering education is keyed to the fact that current and future demands will be for the solution ofproblems economic,technical systems on a global basis. The attributes that needs to beaddressed to reflect the industrial perspective as follows:
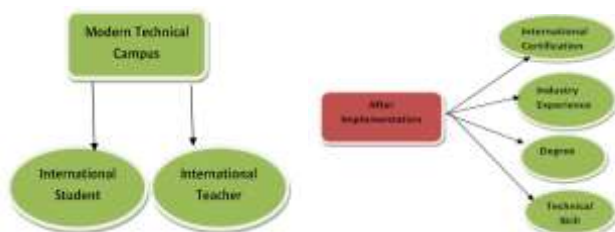

Fig 2 Modern Campus

XIII. IMPLEMENT NEW METHODOLOGY IN GRADUATE EDUCATION

Portfolio
Portfolio is a personal collection in which the person depicts and documents his/her successes and learning while the studies used to be realized on papers were archived.

E-portfolio
The development of the technology, they started to keep these studies in electronic environments such as tapes, floppy disks, CDs, DVDs, websites and removable disks. This type of portfolio which is more effective, striking and appealing with the audio and video materials is called as electronic portfolio (e-portfolio)

Student Portfolio
A **student portfolio** is a systematic collection of student work and related material that depicts a student's activities,accomplishments, and achievements in one or more school subjects. The collection should include evidence of student reflection and self-evaluation, guidelines for selecting the portfolio contents, and criteria for judging the quality of the work. The goal is to help students assemble portfolios that illustrate their talents, represent their writing capabilities, and tell their stories of school achievement.

Project Portfolio
Useful in an academic and professional setting shows the efforts or steps taken to complete a specific project or independent study.

Professional Portfolio
Useful in a professional setting demonstrates your skills, a background, accomplishments and experiences. This portfolios versatile and can be arranged for a specific position.

Online Portfolio
An online portfolio provides a way to reveal your credentials to the world. It allows you to package the best evidence of your candidacy for employment such as your resume, design work, artwork, reports, lesson plans, transcripts, certifications, articles, letters, and more in a form easily accessible via the Internet.

Use of E-Portfolio in Education
Student should introduce themselves digitally in a digital world.

There are many reasons for the use of e-portfolio in education
- An e-portfolio effectively reflects the learning process.
- Technology enables the use of a range of media – video, sound and images – as well as text to show both the learning process and final products.
- The e-portfolio encourages and facilitates the learner's support network to participate and provide feedback on their learning.

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- The quality, not just the quantity, of feedback is enhanced and facilitated via social mediums.
- The e-Portfolio assists students and teachers to take increasing responsibility for their own learning. It encourages and enables the process of reflection, self-evaluation, and action planning as a process for lifelong learning.
- The e-portfolio not only develops skills, it develops approaches to learning.
- Students can carry their e-portfolio throughout their learning journey and use it to record, assess, evaluate, and reflect at any time.

Advantage

- Electronic Development Files Strengthen the Active Learning.
- Electronic Development Files motivate the Students.
- Electronic Development Files are Feedback Tools.
- Electronic Development Files are Evaluation Tools.
- Electronic Development Files allow the Students Studies to be shared.
- Electronic Development Files improve the Concept of Lifelong Learning.
- Electronic Development Files allow the Students to Recognize the Technology:

XIV.   USED CLOUD COMPUTING IN EDUCATION

Cloud computing to provide professionals and students with a thorough knowledge of Cloud Computing Technology using Microsoft Azure as a platform. Over the next decade, nearly two-third of all computing is expected to shift to the cloud, leading to a huge demand for Cloud Computing professionals. Education plays an important role in maintaining the economic growth of a country. Now a days the classroom teaching is changing and students are becoming more technology oriented and Therefore in his changingenvironment, it's important that we think about the latest technologies to incorporate in the teaching and learningprocess. One more thing is developed in this new era that is Cloud Computing. Using this technology we can teach to anyone who cannot afford the education or who lives in rural area. By using this we can build the good education system and increase the quality of the system. One of the latest technologies prevailing now days is Cloud Computing. By sharing IT services in the cloud,educational institution can outsource noncore services and better concentrate on offering students, teachers, faculty and staff the essential tools to help them succeed. This paper focuses on the impact of cloud computing on theeducation system and how we can provide the quality education by using the above technology.
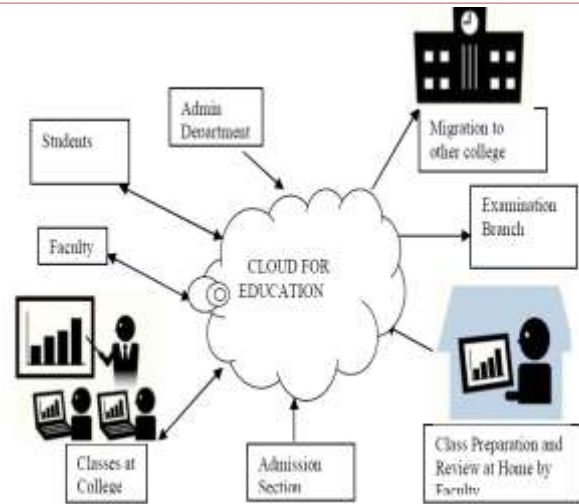

Fig 3 Cloud Architecture for Education

XV.   IMPLEMENT INTERNATIONAL CERTIFICATION PROGRAM

Fig 4 International Certification Programs

XVI.   PROPOSED SOLUTION

The institutions and employers have to work together and make changes to the curriculum so that it meets the needs of the industries. The institutions need to focus on quality on students rather than quantity. The traditional methods of teaching have to be done away with in this era of internet, information and technology. Professionals and experienced engineers from the industry should be included in the faculty or as special instructors so that the students get a real time experience and knowledge of the industry.

XVII.   FOR STUDENTS

Where these changes needs to be applied to the education system as a whole, students can work on their part to make themselves employable in this competitive and fast changing economy. Here are some guidelines which can be followed to seek jobs as engineers:

1. **Score well:** Your scores are your first impression Most of the companies filter out the resumes in the first stage comparing the scores. So, your obvious first step in getting a job as an engineer would be to score high marks in your exams.

2. **Bring originality to your resume:** Most of the candidates prepare their resume looking at the resume of their seniors or friends or following the format given on internet.

3. **Get some training and practical experience:** The projects and training modules that are done in engineering colleges are primarily useless and when the graduates look for jobs as fresher, they neither have skills nor confidence to carry out any project independently.

4. **Build your expertise:** the major trend among engineering students is joining short term courses and trying to collect more and more certificates during their vacations It is better to specialize in one particular field than being a jack of all trades. Determine your goal and work towards it.

5. **Stay informed:** The economy is changing rapidly, so are the needs of the industry. You need to be aware of the current trends and requirements. More theoretical knowledge and academic skills will not help the graduates obtain employment. They have to acquire new skills to maintain their sustainability.

6. **Work on your confidence and communication skills:** Honing up your communication skills is very important as it is as important to convince your employer about your skills as it is to develop your skills. Again, as an employment seeking graduate, you need to work on your confidence to impress your employer and to grab opportunities as they come by.

1. **Rich content vetted by Industry**: eLearning content is one of the major contributors for driving online education. In order to steer student engagement and improve the overall learning experience, usage of rich content (with rich media content, indexed content) which is frequently updated by industry professionals will have an edge over static textbooks.

XVIII.   FOR INSTITUTIONS

Fig 5 Smart Classroom Design

2. **Analytics-driven platform**: In order to focus on individualization and customized courses for students, the next generation of LMS platforms should run on artificial intelligence based predictive analytics which will be adaptive to a student's lesson plan.

3. **Blended Learning**: Blended Learning flips the present classroom setup where online MOOCs should be coupled with classroom sessions (physical or virtual). This would do away with the constraints of faculty.

Fig 6 Blended Learning Approach

4. **Enable faculty reach**: The institutions should provide training sessions for teachers which would enable them to conduct online delivery virtual classes. These trained teachers can teach a larger number of students effectively.

XIX.   CONCLUSION

The growth of engineering education since the last two decades has been phenomenal with the entry of private players in the country. The quality of most of these engineering institutes is questionable given the fact that employability skills are missing among the pass outs. The premier institutes are producing very small number of engineering talent at all degree levels. There is urgent need to address the problems ailing the technical education otherwise India will miss the opportunity to utilize its demographic dividend of a young work force which it has. My primary advice regarding engineering education is that making universities and engineering schools exciting, creative, adventurous, rigorous, demanding, and empowering milieus is more important than specifying curricular details. As we develop the concept of a new curriculum and new pedagogy and try to attract and interest students.

XX.   FUTURE NEED

The work of an engineer is increasingly global projects based in other countries, international teams and therefore engineers must be able to work globally. Global skills are the non-technical skills needed by engineers to solve today's engineering challenges.

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