BridgeLabz

Tech Employability In India

Challenges And Solutions

Overview

Every year, thousands of engineers graduate from reputed engineering colleges of India with flying colors, however, just a few of them possess the skill set required by the companies.

A report released by an **employment assessment company Aspiring Minds** revealed " Macro employability and employability trends show no change over the past nine years. Even today, 80% of engineers are not employable for any job in the knowledge economy."

Furthermore, the report also revealed that "Only 2.5% of Indian engineers possess the skills in artificial intelligence (i.e., machine learning and data science) that industry requires. Only 1.5% - 4.5% of engineers possess the necessary skills in data engineering, while only 2.8%- 5.3% are qualified in wireless technologies. These figures pale compared to the percentage of engineers (5.5%) that are qualified for basic programming. However, the true employability figures for data science are actually much lower: only 50%- 60% of these numbers (or 1.5% total) when we factor in other skills such as cognitive and language that are key for career success. If India hopes to become competitive and achieve parity with international competitors, then all national stakeholders must help our engineers move beyond basic coding skills to meet the demands of 21st century industry."

By the time the engineers and **programmers** upgrade themselves with the required skill set, technology evolves and there is a disparity yet again. This gap either compels the engineers to opt for alternate career options or to unemployment.

This paper focuses on **tech employability problems in India and their possible solutions.**

Brief Description

The Wikipedia describes employability as **"doing value creating work, getting paid for it and learning at the same time, enhancing the ability to get work in the future".**

Technology is evolving at such a rapid pace that the new trends seem out-of-date before they even go live. Each day we have new technologies and upgrades for the existing technologies that are replacing the redundant ones.

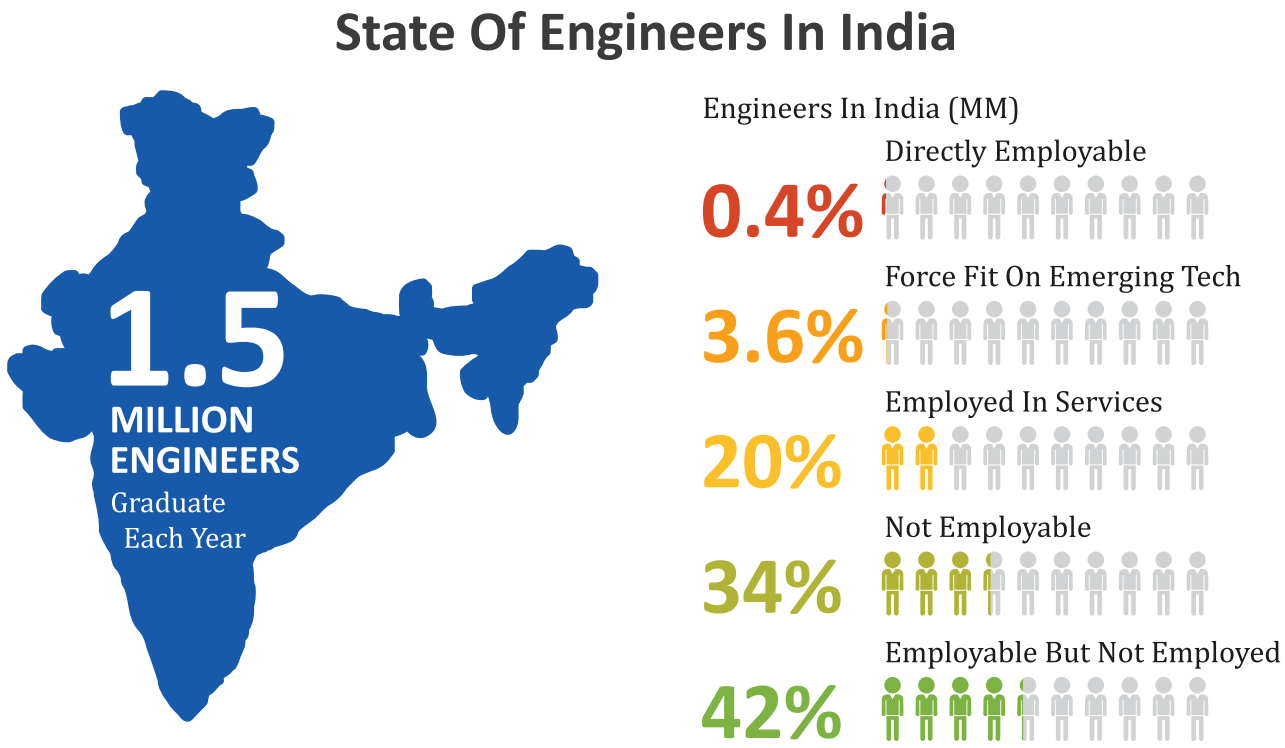


Figure 1 **Source: BridgeLabz Engineer Survey 2019, 1108 Engineers Across India, AISHE 2014-15**

Technology-based careers do not change but evolve and the IT professionals are required to keep up with the trend by learning continuously and by keeping track of these changes. However, by the time the students graduate from colleges and learn about the technology, the upgrades for that particular technology are ready, and up in running.

The question here is, are the engineers who pass out from college every year well-equipped to get jobs in their respective fields and do they even have the basic knowledge to work on the new emerging technologies.

Considering the vast syllabus of the engineering field, the students often memorize by rote ancient textbooks with no comprehension of basic concepts in a mission to clear their semesters without failing. The passion to learn dies over a while and the students are only interested in finishing their four to a five-year degree course. On completion of the course, what transcends is something different.

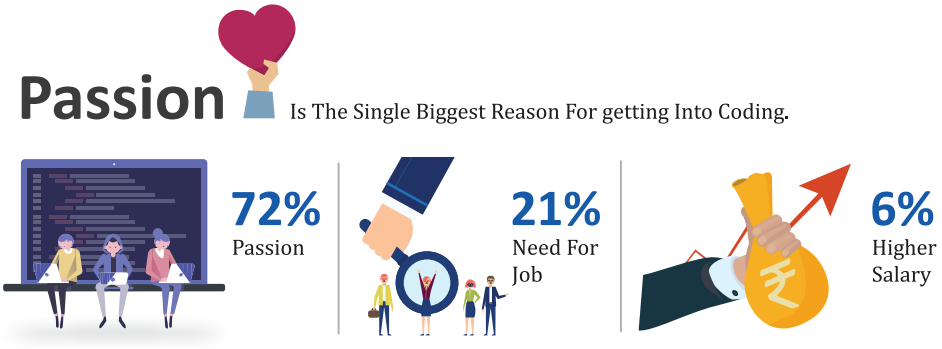


Figure 2 **Source- BridgeLabz Engineer Survey 2019, 1108 Engineers Across India.**

The disparity in engineering is not just restricted to lack of skill set but also extends to genders as well. A survey conducted by BridgeLabz attributes difficulty in landing emerging tech jobs at a lack of confidence in women at 31% compared to 26% for men.

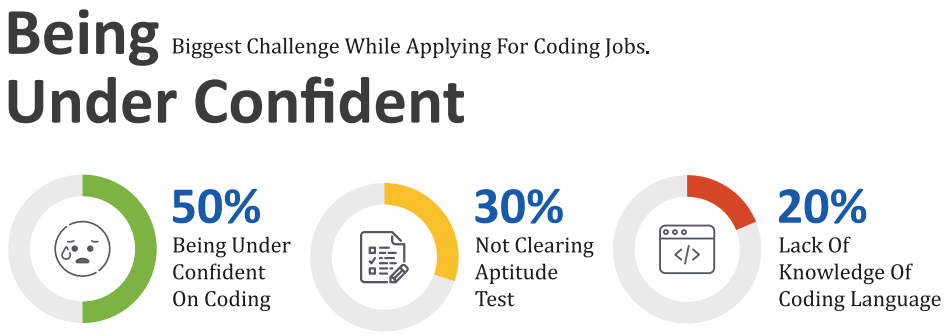


Figure 3 **Source- BridgeLabz Engineer Survey 2019, 1108 Engineers Across India.**

Where 61% of women cite the absence of hands-on experience as the most dominant reason compared to 38% by men. It was also noted that women were equally passionate about coding but gave less importance to salary.

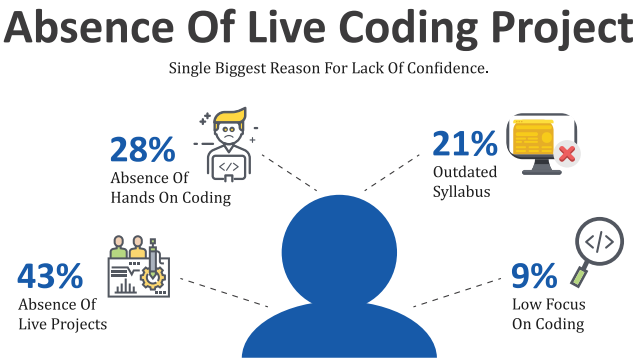


Figure 4 **Source- BridgeLabz Engineer Survey 2019, 1108 Engineers Across India.**

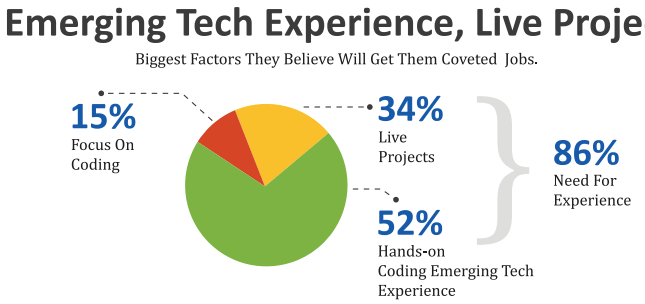


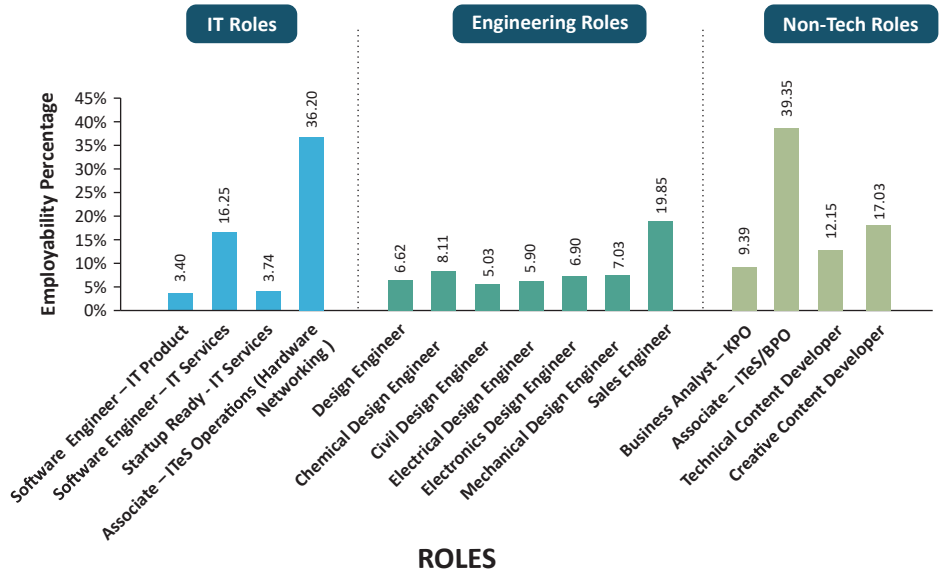
Figure 5 **Source- BridgeLabz Engineer Survey 2019, 1108 Engineers Across India.**

As a result, women were not paid equally and a huge disparity has been created with regards to the salary. This made them less confident and less likely to opt for jobs in the coding sector.

Key Issues Faced By the Graduated Engineers

The graduated engineers are expected to apply basic concepts or principles to solve real-world problems. These **engineers are clueless due to their faulty learning practice.** They need to acquire special training to sharpen their skill set and to stay upbeat with the industry requirements. This means the companies need to invest in special training programs for the newly-passed engineer graduates or when they **hire a software programmer.** This is an expense that most companies do not wish to incur especially after hiring an "engineer." The **companies aim to hire a programmer who can start with the job on the first day itself.**

The role that these engineers are expected to play and the skills that they possess do not sync. The engineers need proper hands-on training for the position they are hired for. With neither the requisite skills nor knowledge, they flounder and then seek to find jobs that are not related to their field to sustain their financial needs.



Employability Percentage of Engineering Graduates in Different Roles

Figure 6 **Source: BridgeLabz Engineer Survey 2019, 1108 Engineers Across India, AISHE 2014-15**

Semester systems and the process of evaluation do not fulfill their desired roles as the students are only interested in getting good grades. Skill-based education is a good option for this. Engineering students need to have hands-on training based on the problems they are likely to encounter in the real world. The lack of an in-depth understanding of the concepts and insufficient knowledge across domains are the skill gaps that need to be filled.

Engineers realize their shortfalls only when they have to imply their knowledge to practicality. So they either need to extra time to enhance their skills themselves or suffer unemployment. There are few other engineers who fail to find the relevant jobs and as a result, they decide to opt for non-tech jobs in order to meet their financial requirements. There a few of these engineers decide to take up jobs as team leads, project managers and start dabbling in new areas like recruitment, business development, budgeting, and so on. So finally, an engineer becomes an expert in fields he/she did not graduate during his/her engineering course.

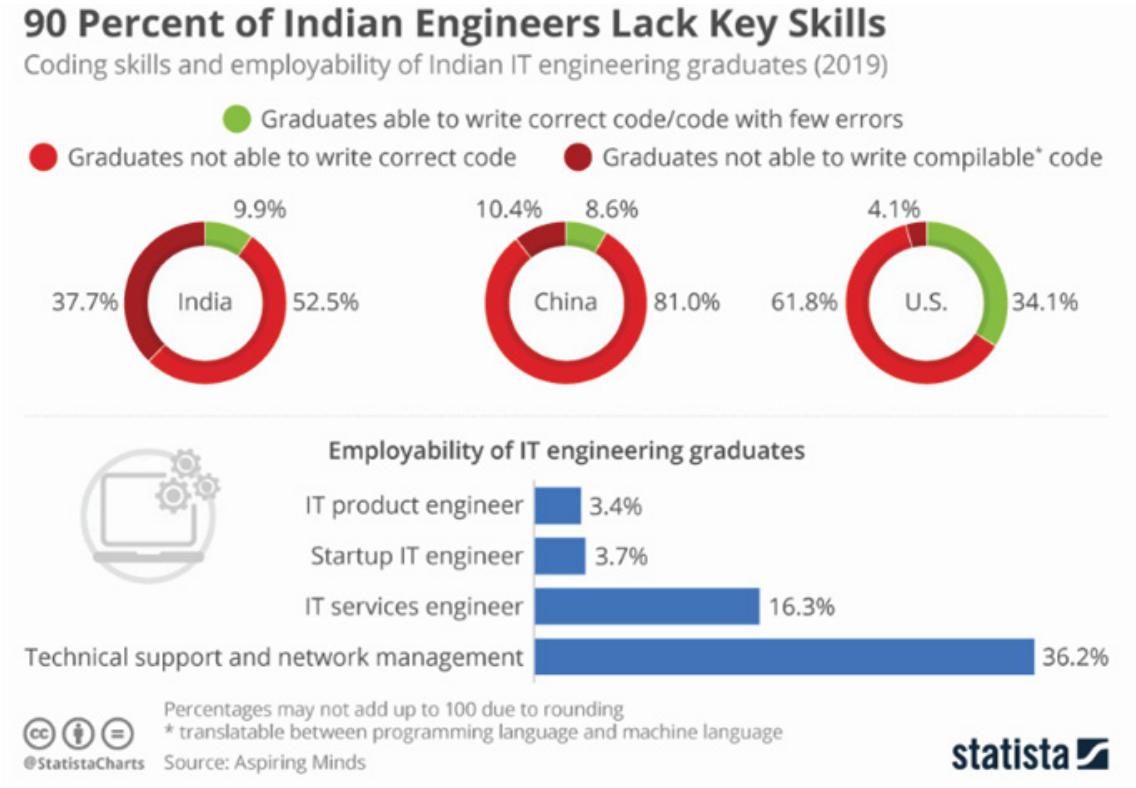


Figure 7 **Source: Aspiring Minds**

As per the National Employability Report on Engineers, Indian engineers lack the relevant IT skills including advanced tech skills like artificial intelligence, machine learning, data science and wireless technologies among others that the companies require. India needs to train its engineers in cutting-edge digital and data skills including AI, IoT, data engineering, robotics, and mobile technologies. The initial focus must be on building capacity in faculty that are already familiar with information age technology, the report found.

Simply put, overall, only 1.5 percent of Indian engineers and programmers have the required skills for the new age jobs. It also states that only a handful of Indian engineers possess coding expertise. "Good coding skills are possessed by only 4.6 percent of Indian job applicants."

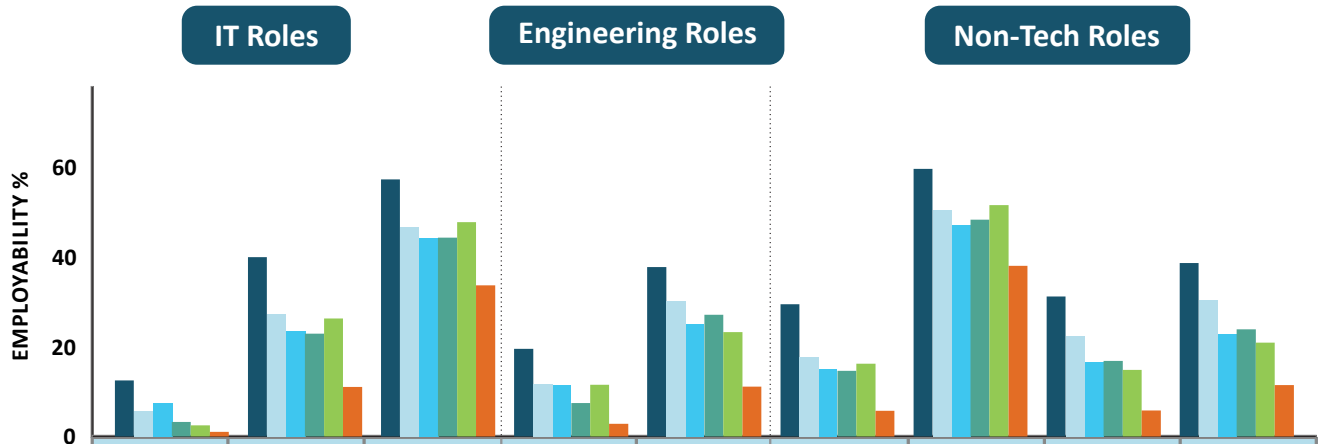
Recent research suggests that over 1.5 million engineers are graduating every year in India. Of these, 80 percent are unemployed, and an estimated 45 percent have the potential to be made employable with the right training.

Many of the fortunate ones who end up getting a job after an engineering degree take up jobs that are well below their technical qualifications. Yet another study conducted by Aspiring Minds suggests that less than 5 percent of engineers can write correct logic and an even lower number (1.4 percent) could code correctly.

Additionally, even the skills of existing engineers in the field are being rendered redundant because of rapid technological advancements in areas such as AI, ML, and the Cloud.

This will require strategic reskilling and up-skilling, to maintain a skill-set amongst engineers that is at par with industry standards. Furthermore, the report also revealed that only 10 percent of the engineers have adequate coding skills. Also, it showed that only three to four percent of the engineers are fit to fill roles like product engineer or startup engineer.

Many engineering colleges have been springing up in India in the last few years. Around 1.5 million engineers in India pass out every year. The logical Indian, a huge Facebook community which started their website some time back, wrote about a mechanical engineer who drives an auto-rickshaw in New Delhi because he has a family to look after.



	Software Engineer IT Product	Software Engineer IT Services	Associate ITeS Operations	Design Engineer Non IT	Sales Engineer Non IT	Business Analyst KPO	Associate ITeS/BPO	Creative Content Developer	Technical Content Developer
New Delhi	11.28%	36.18%	51.86%	17.67%	34.18%	26.67%	54.02%	28.24%	34.98%
Bengaluru	5.10%	24.75%	42.21%	10.59%	27.27%	15.99%	45.60%	20.35%	27.53%
Mumbai+Pune	6.78%	21.16%	40.07%	10.35%	22.66%	13.58%	42.73%	14.95%	20.66%
Kolkata	2.91%	20.74%	40.14%	6.72%	24.53%	13.22%	43.75%	15.25%	21.60%
Hyderabad	2.20%	23.81%	43.27%	10.43%	21.07%	14.70%	46.71%	13.42%	18.91%
Chennai	0.94%	10.00%	30.50%	2.52%	10.03%	5.15%	34.41%	5.21%	10.33%

Employability percentage: Top 100 colleges vs. Rest

Figure 8 **Source: Aspiring Minds**

The entry-level jobs in IT are not easy to get. You need to have extra skills not covered by the college curriculum, which is often outdated. Is this the future of the engineers we are aiming for?

Proposed Solutions To Bridge The Gap

We need to find solutions to bridge this gap. Bridging this gap is quite challenging. The reason is that engineering has become an ever-expanding horizon. In the last few years, several engineering colleges have been springing up like wild mushrooms in India.

The Indian curriculum is far behind as far as programming languages are concerned. They still teach languages such as BASIC, FORTRAN, which have become obsolete now. These students are expected to make their way into the most emerging technologies such as C, C++, Java, etc. The situation is the same or worse in core engineering courses such as mechanical or civil.

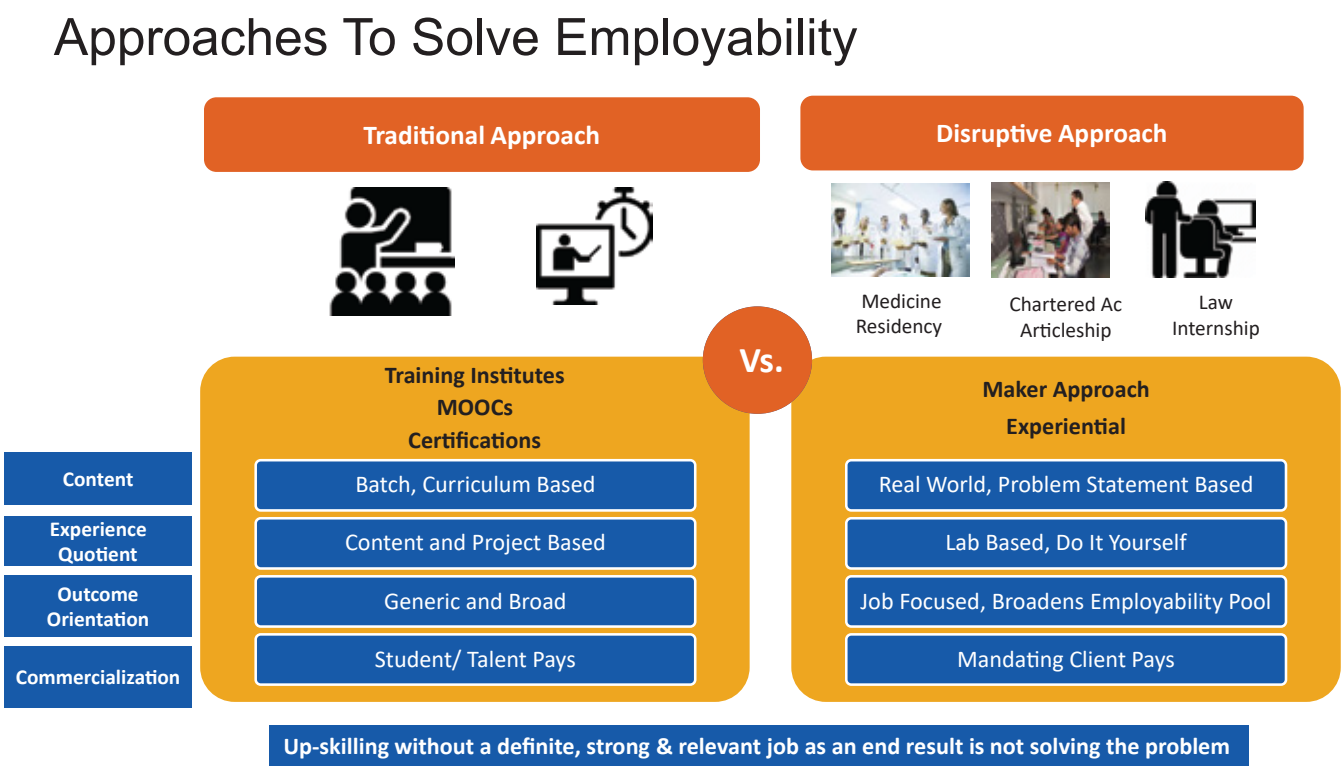
Varun Aggarwal, CTO of Aspiring Minds, said, **"The science of manufacturing has moved way ahead but we continue to teach outdated concepts to students. For India to become the world's manufacturing hub, we need to lead from the front in our understanding of cutting edge methods, knowledge-driven management, and implementation capability."**

Since technology can be integrated into different fields of engineering, we need to find solutions to prepare our engineers for the future professional landscape through experiential learning for all fields. This problem of employing the engineers need to be addressed and solved to bridge the gap.

Firstly, the universities need to bridge this gap in the curriculum and update their syllabus yearly. They must make sure that the curriculum is at par with the practical skills that are required by the companies. To get this done, it will take a lot of time as the Education Department may need to roll out policies that would ideally change every year for the curriculum to be changed.

The current trend today is that we see most of the engineers are opting to do an MBA. You don't see a similar trend in other professions such as medicine, law, finance/chartered accountancy, entrepreneurship. So, the question, why is an MBA after engineering such a popular option for Indian professionals is something that needs to be considered? One of the reasons being better job opportunities in terms of positions and money prospects.

Whether it's medicine, chartered accountancy or law, each professional program involves forms of practical exposure so that the to-be professionals can get a feel for the real-world application of their subjects.



Additionally, they involve forms of continuous mentorship and evaluation where, under expert guidance, the understudy can learn by researching and experimenting by themselves. This ensures that they are prepared for various scenarios and can find solutions that apply to real problems.

Engineering education needs to be built upon a similar framework in mind. It requires hands-on learning at different stages, including projects that add real value to their solutions. Additionally, there is a need for guidance from industry experts to expose students to the versatile application of subject matter.

Combining these factors of value-addition, experiential learning and mentorship will facilitate the creation of a pool of Indian engineers that are equipped with relevant skill-sets. This will help to make fresh graduates directly employable for a wider range of jobs in the tech industry. The companies will also find it easy to **hire programmer for project.**

Additionally, the same formula can be applied to existing engineers in the field, where they can re-skill and up-skill to meet the latest requirements of their roles. In the long run, this model of hands-on training is what will enable both fresh and experienced engineers to effectively adapt, and thereby contribute to the dynamic needs of the industry.

The tech industry needs graduates to be equipped with skills in AI, Machine Learning (ML) and data science to keep up with the changing requirements of the sector. The most common reason for not being able to secure a tech job is their lack of knowledge and confidence. It is hence mandated that the engineers get a chance to try their hands-on practical work than restrict them to theoretical work.

Can we solve the unemployment issue of the engineers by providing jobs? Well, not really! Without the skill-set, the engineers and programmers will find it hard to sustain in any company. Hence the engineers must be equipped with relevant skill sets to get the right jobs. This will require strategic reskilling and up-skilling, to maintain a skill-set amongst engineers that is at par with industry standards.

Each professional field needs a hands-on experience to get a feel of the real-world application of their subjects. Under expert guidance, the understudy can learn by researching and experimenting by themselves. This ensures that they are prepared for various scenarios and can find solutions that apply to real problems.

The general quality of India's engineering graduates is exactly where it was a decade ago, with next-gen tech skills still a chimera, the new Annual Employability Survey 2019 by Aspiring Minds has revealed.

What's the Future?

The biggest question that looms now is regarding the road ahead; what does the future hold for engineers? Artificial intelligence and machine learning, cloud-based and quantum computing, additive manufacturing, and nanofabrication, advanced automation and robotics—these disruptive technologies are already impacting every industry. Although concerns about job loss due to automation are not without merit, these technologies are also poised to open up entirely new fields of study and employment never before conceived.

These new roles are creating new roles in the organization, especially with regards to technology. There is a growing need for programmers and resources who can innovate in order to bridge the gap. While the traditional method of recruitment is a practice of the past, combining skills and recruitment will ensure employment and productivity in every sector.

Conclusion

While the engineers can be trained on the skillset after they graduate, the academic institutions and policy planners must restructure the curriculum and incorporate the important components of technologies in every field may it be arts, engineering or commerce and make the talent ready for the marketplace. This will certainly help us create a brighter future for the youngsters of our country.

We can thereby conclude that the employability bridge can be covered by equipping the budding engineers with the relevant skill set and by lending the perfect platform. By doing this, we will succeed in preventing the aspiring engineers from deviating to other job roles due to lack of opportunity. Furthermore, the relevant skill set will give the engineers confidence in performing what is expected out of them.

Bibliography and Sources

Economic Times: 90% of Indian Engineers Lack Key Skills: Report
//economictimes.indiatimes.com/articleshow/68843525.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Business Today: 80% of Indian Engineers Not Fit For Jobs Says Survey
https://www.businesstoday.in/current/corporate/indian-engineers-tech-jobs-survey-80-per-cent-of-indian-engineers-not-fit-for-jobs-says-survey/story/330869.html

Financial Express: Tech jobs: Making talent ready for the marketplace:
https://www.financialexpress.com/jobs/tech-and-jobs-making-talent-ready-for-the-marketplace/1706962/

The Logical Indian: A Mechanical Engineer, An Auto Driver:
http://thelogicalindian.com/my-story/a-mechanical-engineer-now-an-auto-driver/

mbcet.wordpress: Over 80% of engineers in India still unemployable: National Employability Survey report by Aspiring Minds:
https://mbcet.wordpress.com/2016/01/25/over-80-of-engineers-in-india-still-unemployable-national-employability-survey-report-by-aspiring-minds/