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## Declining Interest in Engineering Studies : CASE STUDY

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### Abstract

Until a few decades ago, engineering was one of the most in-demand careers in the country. It takes extraordinary skills and talents to earn a place in an engineering school. Indian engineers are highly valued and international companies want to hire such people. This has led to a situation where most American engineers are of Indian descent. However, over the years, it was noticed that the employability of engineering graduates in the country began to decline significantly. In the process, the engineering began to lose the luster it once had.

In 2018, India was producing around 1.5 million engineering graduates annually. About 40% of them found jobs through on-campus internships or the same year they graduated. Another 40% took about a year to find a job.

The remaining 20% take two years or more to find the job of their choice.

If that wasn't enough, many engineering graduates who find employment are expected to work in the BPO industry or other industries separate from their specialty. This trend is indeed worrying and can be attributed to the fact that today's students lack employable skills. This article explores some of those reasons.

A number of factors have contributed to this decline, including the difficulty of the study program, the attractiveness of alternative pathways to good technical jobs, and the unattractiveness of projected employment pathways for engineering graduates. This decline comes at a time when employers of engineers are facing new challenges due to globalization, outsourcing and the need to "move up the food chain" in terms of innovation and technical expertise to remain competitive – thereby creating demand for more qualified professional engineering graduates.

Much of what needs to be done to make engineering more attractive to bright students is well known, but educational institutions, engineering employers and government policy makers have been slow to take active steps to address these problems effectively. The author tries to give a full description of "what can be done".

## Pipeline issues

There are many reasons for the decline of student interest in engineering:

### 1. previous Curriculum

it's miles essential to remember that generation is a discipline that is continuously updating itself and as engineers, people need to keep pace with the same. consequently, it is essential for an man or woman to gain knowledge of the ultra-modern technological traits if he or she desires to be employed in a company at once after university. however, the syllabus in Indian technological universities do now not prescribe this. Even today, things like quantum computing, iOS utility improvement, and IoT aren't taught in most Indian engineering faculties on the below graduate stage. back in the west, maximum of the us colleges were teaching these courses to its underneath graduate technical college students for years now.

### 2. The curriculum is difficult

tons difficult take a look at and tough work is covered in the current undergraduate curriculum in engineering, and this is constructed on top of strenuous prior coaching requirements within the secondary training years. Engineering curricula usually begin with years of excessive arithmetic and technological know-how – which include calculus, opportunity and statistics, modern-day physics, chemistry and biology – often taught by way of service branch faculty participants who do not put this preparatory paintings in the context of engineering applications. that is commonly followed through difficult engineering technology guides, taught by using engineering faculty contributors – however regularly research oriented doctoral graduates with little implemented engineering experience to deliver into the study room for motivation.

### 3. loss of realistic application

maximum Indian engineering colleges follow the trend in which 70 to 80 in line with cent of the overall weightage of any paper is at the concept part of it. In this type of state of affairs, students who are fantastically exact in teachers realize very little of the sensible utility of what they study within the study room. As a end result, once they graduate and get into the enterprise, groups that hire them need to spend a whole lot of sources and attempt in schooling them and making them 'industry equipped'. clearly, most work locations might not want to incur such an delivered expenditure and as a end result, the scholars frequently discover themselves unemployed after college.

### 4. The curriculum is densely packed and inflexible

despite the fact that the wide variety of credit hours required for graduation in engineering has drifted downward as other elements of the university head for simplest one hundred twenty credit hours for graduation, the real time required for engineering students to complete degree necessities remains a whole lot higher than for different fields. The 4-12 months bachelor's degree packages in engineering colleges are usually tremendously lock-stepped, with stipulations supplying little flexibility for individualized packages or broadening experiences – inclusive of a semester abroad. Engineering college students who miss a required step within the proper order often must take an extra semester or 12 months to complete their studies – at large extra fee and loss due to postponed employment.

### 5. loss of enterprise exposure

In maximum engineering faculties in the us of a, internship isn't a part of the curriculum. Even in cases wherein it is a part, the credits allotted to the equal is negligible. it's far obvious that with out being in an enterprise it's far impossible for an character to apprehend the fundamentals of its functioning. this is why, Indian engineering graduates frequently locate themselves in conditions wherein they do not know the fundamental functioning of the enterprise they paintings for and hence they are unemployable.

### 6. other paths to excellent jobs are less complicated

excessive college college students looking at diverse options for college level have a look at frequently evaluate engineering to change paths – consisting of pc science – where the curriculum is less bold, and wherein jobs at repayment levels similar to engineering jobs are effortlessly to be had.

### 7. Engineers treated as commodities with the aid of employers

within the present day employment environment, engineers are often treated as commodities by employers. they're in all likelihood to be laid off when the quarterly stability sheet isn't always high-quality, or when new graduates with sharper technical abilities are available at lower fee, or while their function can be offshored at decrease cost to the business enterprise. This leads to employment styles that encompass a couple of positions with distinct

employers, however frequently involving lateral movements at quality. previous styles of upward mobility in the course of a progressing career are frequently lacking (Jones and Oberst 2003).

eight. traditional entry degree jobs are being offshored

The styles of jobs that clean engineering graduates have filled till recently – support positions in technical operations of huge employers of engineers – at the moment are frequently being outsourced to offshore locations wherein true technical skills is to be had at much lower price. this will result in fewer activity possibilities for bachelor degree engineering graduates, and decrease income gives (Oberst and Jonaaes 2004).

nine. tender abilities. The most effective manner to continue to exist - in MNCs is to have properly communication capabilities. through conversation capabilities, we refer to each verbal in addition to written verbal exchange. Indian engineering college students are frequently seen to be missing this. The present day engineering training scenario right here is such that there is nearly no importance paid to the development of tender abilities and different behavioral abilities and manners. that is all the way truer inside the case of students from the smaller towns and villages. other than the fact that organizations prefer college students who are proficient in English, the opposite side of the tale is the fact that by using not being fluent in English students frequently suffer from a loss of self confidence which in turn hampers their prospect at searching for a process even similarly making them all the way greater unemployable.

### 8. wrong career choice

As sad as it sounds, the reality is that India is a country where humans come to be engineers first and then decide what to do. (that is why you will often see Indian engineers making it big as writers, musicians, artists and what not). most people who take in engineering haven't any hobby on this discipline. it is parental or peer stress which makes them do it. As a end result, they're unable to put their coronary heart and soul to it and frequently grow to be appearing very terrible inside the subject. The best manner out of this is arising with some method via which it is able to be tested if a pupil honestly has the quality and flair for the difficulty that she or he is proceeding to have a look at. at the private degree, dad and mom must take it upon themselves to perceive their child's potential by the point she or he completes their magnificence 12th board checks. until and until engineering is their proper calling, they should not be driven to it. eleven. Media reviews indicate instability

The offshoring of technical jobs, as reported frequently in the media, transmits an air of secrecy of instability in the engineering profession – together with the threat of unemployment. capability engineering students and their families see such reports, and are frequently stimulated away from engineering observe and employment.

### 9. Emphasis On Rote gaining knowledge of

in case you study the Indian engineering education situation, you may find that the maximum recognition right here is on rote mastering. The engineering front checks are all approximately the formulae and equations that one has mugged up. Even at the beneath graduate level, wherein engineering students in different college students are given components sheets and their check is specially approximately software of the identical, in India, college students need to memorize all the components. This appliesto the greatest engineering institutes of the country like the IITs and NITs as well. the point of interest here is in reality on rote leaning over the truly medical and technological studying. on the grounds that in the real process situation there is not much use of rote studying, these college students locate themselves unemployable.

## Suitable suggestion to overcome this declination

"Engineering programs must demonstrate that their graduates have:

- a) the ability to apply mathematical, scientific, and engineering knowledge
- b) the ability to design and conduct experiments and analyze and analyze data
- c) an ability to design a system, component, or process to meet all Ability to demand
- d) Ability to function in multi-disciplinary teams
- e) Ability to identify, formulate and formulate problems of engineering
- f) Understanding of professional and ethical responsibilities
- g) Ability to communicate effectively
- h) Understanding of engineering General education needed to impact solutions in global and societal contexts
- i) Ability to recognize the need for and commitment to lifelong learning
- j) Knowledge of contemporary issues

k) Use of techniques, skills and tools they of modern engineering necessary for the practice of engineering Ability to use "

Engineering schools must demonstrate by results. Make sure their graduates have acquired these qualities. Engineering graduates from companies must become increasingly interdisciplinary in education and methodologies to keep pace and benefit from the convergence of the worlds of biology, nanotechnology and information technology.

### What can education do?

- ♣ Humanize the curriculum [ex. redesign the first year to motivate students to immerse themselves in math and science; focus on how to learn rather than covering everything in an intense four-year course; replacing lectures with active learning; etc.]  
Emphasis is placed on the relevance of addressing social issues, providing motivation for hard work [eg. environmental, health and infrastructure needs and needs of developing countries] facilitating study abroad and other opportunities for international exposure [for example, engineers without advanced experience]
- ♣ Continuously improve engineering education programs, not just periodically change expectations for the next certification visit
- ♣ Promote systemic change in the country's engineering education system based on distributed innovation successful degree programs, as well as research-oriented courses
- ♣ Develop relevant continuing education opportunities to promote lifelong learning for graduates Engineering education programs at all levels should be only engineering schools have more opportunities to gain international experience through overseas research, education and industrial experience.

### What can the company do?

Business leaders must interact with educators and government policy makers to ensure that the appropriate quality and quantity of skilled workers are available for employment. In the current context, the effects of globalization and offshoring require special attention in business-university-government interactions.

Impact of downsizing

- Employers of engineers should be encouraged to develop a rational and forward-looking approach to determining which technical work to outsource and which to keep in-house – taking into account labor management issues, innovation, IP security, strategic workforce deployment, etc. . .
- Business leaders and universities should work together to look at the academic readiness of engineering students to prepare them to help companies move up the food chain, which is a daily job in this country.
- Recognize that a large number of engineers are going Unemployment is likely, and business leaders should work with universities and government officials to develop and fund appropriate retraining programs Art Practice
- If there is a gap between industry development and the ability of universities to properly prepare graduates to quickly fund university-related research and development
- Businesses and universities should encourage staff to have the opportunity to work in industry

### Conclusion

The declining interest of bright students in studying engineering is due to a combination of factors – the difficulty and lack of flexibility of the program, their perception of today's working environment where engineers seem to be viewed as a commodity, and the reports of many technicians Yet the need for a steady supply of engineering graduates ready to work effectively in the global marketplace has not diminished. University, business and government leaders must take coordinated action to ensure the flow of appropriate numbers of qualified engineering graduates to ensure national competitiveness.



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