

# Indian Higher Technical Education Scenario, Issues, Challenges and Achievable Suggestion

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**Abstract**— *There is turbulent rise in the number of engineering institutions in the last two decades in India. In the present competitive environment, generic skills and professionalism are essential qualities for engineering graduates. The industry requires up to date skill sets from the graduates to incorporate their needs. However, in the present day it has been observed that the engineering graduates are not up to the mark to fulfill the industry requirements. This pressurizes the educational institutions to deliver the best to their students. The quality of teacher plays an important role for student's enrichment. The attitude, skill and knowledge of teacher are one of the most important factors that affect overall progress of the student. The quality of education in various institutes remains questionable, due to the profit-making approach of institute management. In this paper issues regarding quantitative and qualitative growth of engineering education are identified and analyzed in order to improve the present condition of engineering education.*

**Keywords**— *Engineering education, teacher quality, AICTE, UGC.*

## I. INTRODUCTION

Engineering education in India starts from craftsman level to post-doctoral level to meet the need of technical manpower in the country. India's higher education system, in terms of students is the third largest next to China and the United States.

The Deficiencies in engineering education has been exhaustively enumerated in recent years. The professors must teach more about "real-world" engineering problem to improve the quality of engineering education. Students should provide training in critical and creative thinking skills and problem-solving methods. It is required to produce graduates who are conversant with engineering ethics and who can identify the connections between technology and society.

Indian Institute of Technology (IITs) is been globally acclaimed for their standard of education. They enroll 8000 students annually. Their alumni have contributed to the growth of private sector and public sector of India. However, India has failed to produce world class universities. A recent evaluation of universities and research institutes all over the world was conducted by Shanghai University which has no place for any Indian university in first three hundred. According to University Grant Commission (UGC), India needs 1500 more universities with adequate research facilities in order to compete the global market.

Most of the Indian colleges and universities lack in high-end research facilities. The UGC is not only grant giving agency in the country but also responsible for coordinating,

determining and maintaining the standards of higher education. There are various changes taken place in the recent past due to globalization, industrialization, information technology advancement in education. In order to incorporate these changes AICTE, UGC and Ministry of Higher education and other regulatory bodies should think over policymaking, planning, administration and implementation of higher education to revitalize the education system to put it on the right track.

**Major Obstacle in Higher Education in Engineering:** The quality of higher education becomes increasingly important. The present system of higher education does not serve the purpose for which it has been started. In general, education itself has become a profitable business. The quality of education is lost as the quantity of professional institutions increase. This leads to increase in unemployment of graduates. Many observers agree that Indian higher education is the significant and impressive development of the past few decades notwithstanding, it faces major challenges in both quantitative and qualitative terms. According to a study only 25 % of engineering graduates are directly employable. Quality of education delivered in most institutions is very poor.

The quantitative growth of engineering education in India has undoubtedly increased the opportunities for engineering aspirants however, the maintenance of quality becomes the victim of this growth phenomena. Lack of maintenance of standard in institutions and failure in monitoring the same by the regulating bodies is the main factor responsible for this scenario.

**Undergraduate engineering education:** Self-financing private engineering colleges are admitting more than 85% of the students to engineering faculty. According to National Association of software and service companies (NASSCOM) less than 25% of the graduate engineers are employable. It seems appropriate guidelines and corrective measures are not followed while granting sanction to new colleges and discipline. Some of the institutions are found lacking in quality education due to political interference resulting in poor governance. The factors affecting quality of education are-

- Inadequate physical infrastructure and funds
- Lack of autonomy
- Poor quality of training
- Poor learner quality
- Ineffective linkage with industry
- Shortage of self-motivated faculty

The shortage of motivated and dedicated faculty is the most serious problem confronting Indian engineering education system. It is a common practice in private engineering college for a person who passed graduation in engineering to start teaching in the academic year, in fact the faculty position in most engineering colleges are dominated by B.E./ B.Tech degree holder. The IT industry provides more compensation and benefits than educational institutions. Therefore, teaching profession does not attract talented people.

There is a large gap between the knowledge gained by the students in the engineering institution and practices followed in the industry. It is observed that engineering degree holder is weak in professional skill and therefore has to undergo job training for longer duration to become professionally competent.

Most of the colleges do not have basic lab facilities and teaching aids. On the other hand, many have strived to enhance its standard and some of them would rank better than the government engineering college. There are 500000 students in engineering graduate every year, in spite of very uneven standards. This large number of engineering graduates has driven the Indian industry to its glorious height in the last ten years. The initial gain was in IT and telecom industry but now the scope is much wider including auto industry, pharmaceutical industry and chemical industry. Most of these industries do not find the students adequately trained. The primary problem in expanding quality institution in the country is the great shortage of quality teacher. The shortage is because teaching at this level is no longer an attractive profession. The compensation for these highly-trained college teachers in private engineering colleges is far below what the equivalent scales are in the industry. The gap has widened to such an extent that most parents would discourage their children from taking this route. Only a small fraction of the best mind would look for teaching as their profession. These people will always be driven to such an endeavor as their inner quest for excellence would drive them to an academic position and they would consider the rest as a secondary. Even the best institute in the country struggle to find enough quality determined teachers. The other institute find it almost impossible. Many of the new private college are the worst sufferer in many of these institute fresh graduate who fail to get any other job becomes the teacher. The students required proper inspiration, once inspired many of them are capable of working hard and even work on their own to learn adequately.

The low-quality teacher is due to inadequate opportunity. It is often forgotten that training of teacher had been a major focus in the nation. The result of this training most of the time when teacher gets adequately trained he/she leaves the educational institute and migrate to the industry. Those teachers who fail to benefit even from these quality improvement program stays as a teacher the only answer to the quality is to make the profession more attractive. Once this is done enough bright youngsters will find various innovative ways to train themselves to take up such a position.

## II. SUGGESTION TO IMPROVE QUALITY OF HIGHER EDUCATION

*Industry institute interaction:* Industry and institute should connect to ensure curriculum and skill set in line with the requirement. Skill building is very crucial to ensure employability of students. The industry and R & D organizations should have encouraged their engineers for post graduate studies with suitable incentives. Research project should involve cooperation and collaboration between academia and industry. The Academic institution should be encouraged and facilitated to forge close academic collaborations with foreign universities by way of exchange of faculty and students. More opportunities should be created for joint collaboration and research. One of the factors contributing to the success of IITs is the close collaboration with foreign institutions.

*Innovative practices:* The new technology offer vast opportunities for progress in all walk of life. It offers opportunities for economic growth, improved health, better service delivery, improved learning and socio cultural advances.

*Learning society:* The nation will have to prepare to invest more and more on higher education. To reduce the faculty crunch, retired faculty should be hired and the services of qualified engineers from the industry and R & D Institutions can be taken in academic institutions.

*Incentives to teacher and researchers:* To make teaching profession more attractive, exciting and research oriented financial and other incentives such as research grants should be offered to perspective and dedicated teachers, performing teachers should be rewarded with higher remuneration. Industry is expecting specialized courses to offer to the students to include the latest and the best in education.

*To mobilize resources:* The decline in public funding in the last decade has resulted in serious effect on standards due to increasing cost on non-salary item and emolument of staff. There is a need to relate the capacity of student to pay the fees to ensure that a student at lower economic level can have highly subsidized education.

*Higher education:* It should be mandatory for all engineering colleges private or public to depute some of the faculty members to obtain higher degree. The autonomy of the teacher is the precondition of his successful functioning as a member of society. Teacher has an additional function of facilitating a process of social transformation. He/she should not be forced to just follow the instruction of administrations but should be given adequate autonomy and academic freedom to carry and express ideas.

*Student centered education:* The method of higher education has to be appropriate with the need of learning. Student centered education and employment methods will be required to teach with new attitude and new skill. Dynamic session of seminar and workshop must be included in curriculum. The advancement made in the area of ICT can be utilized to reform and expedite the process of knowledge dissipation in engineering institutes. With the availability of teleconference equipment at affordable prize, it is not difficult to broadcast

lectures delivered by eminent teachers in one institution into the classroom of any remote engineering college. More awareness among faculty and students should be created to utilize free online course from MIT (US) and National Program on Technology Enhanced Learning Program (NPTEL). The students should be encouraged to opt additional courses from SWAYAM or any such Massive Open Online Courses (MOOC) facility.

*Job oriented course:* All round development of personality is the purpose of education but the present-day education is neither imparting true knowledge of life nor improving the skills by which one can achieve laurels in the field of interest. Meritorious doctoral students should be recognized through teaching assistantship with a stipend over and above the research fellowship.

*International collaboration:* Indian universities have been a primary conduit for the advancement and transmission of knowledge through their research innovation, teaching, human resource development, and continuous education. International cooperation is gaining importance as yet another aspect. With the increased development of transport and communication the global village is witnessing a growing emphasis on international cooperation and action to find satisfactory solution to problem that have global dimension.

*Cross culture:* While completing of education the students should encourage visiting various places of the country as well as abroad with the cooperation of the Government so as to understand people, their culture, arts, literature, religion, technological development and progress of human society.

*Quality development:* The higher education should be characterized by its international dimensions, exchange of knowledge, interactive networking, mobility of teachers and international research projects. While taking into account the national cultural value and circumstances the level of education and knowledge must be maintained by the colleges. Instead of concentrating on quantity these institutions should concentrate on quality. The approach of doctoral research in social sciences needs to be more analytical, comparative and related to the society.

*World class education:* There should be first priority to the development of standard in education. India should aspire for the international standard in education. Many national universities in US, Europe and Australia, etc. allow studies in higher education to foreign students in their universities. Indian universities should offer such competitive courses of studies to foreign students taking advantage of the globalization process.

*Personality development:* Education should be for the flowering of personality but not for the suppression of creativity or natural skill. In the globalized world opportunities for the educated people are naturally have ample scope.

*Stipend to research fellows:* The number of PhDs from Indian universities should increase with proper standards. Meritorious doctoral students should be recognized through teaching assistantship.

*Examination reforms:* Examination reforms gradually shifting from the terminal, annual and semester examination to regular and continuous assessment of students. Performance of the

student must be measured not only on the marks scored but on the overall understanding of the subject.

*Internal quality assurance cell:* Private institute should set up Internal Quality Assurance Cell and must follow a minimum standard to given graduate degrees. The quality assurance system must be independent of political and institutional interaction and it must have basis in the legislation. There should be operational, financial and academic autonomy coupled with accountability. There is a need of an independent accreditation agency with a conglomerate of government.

*Libraries:* library should have a very good collection of books. A library must be online and conducive for serious study. All universities should concentrate more on providing quality education which should be of international standards.

### III. CONCLUSION

The growth of engineering education since the last two decades has been phenomenal with the entry of private engineering colleges. The quality of the engineering institute is questionable given the fact that employability skills are missing among the pass outs. The prime institutes are producing very small number of engineering talent. There is urgent need to address the problems. Attitude, skill and knowledge are the indispensable domains of an engineering college teacher. Subject knowledge and communication skills are most important attributes for a teacher. A person with relevant knowledge and skill but inappropriate attitude will not be able to contribute much to the organization and the community. There is a pathetic situation that a person having a great skill and knowledge and are not socially responsible can do a greater damage to the organization and society.

Today India is one of the fastest developing country of the world with the annual growth. Also liberalization of higher education in India over the last 25 years has enabled creation of huge capacity which today fulfills the required demand. The youngsters are no longer denied the higher education opportunity. The students from backward community and rural areas have also started getting their share of the education. The initial linearization of the education has resulted into its democratization.

To attain and sustain national, regional and international quality of education certain components such as careful selection of staff and continuous staff development are particularly relevant. The promotion of appropriate program for academic development including teaching and learning methodology is required. Also, the mobility of students among institutions in India and abroad is essential.

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