

# CHALLENGES IN ACHIEVING EXCELLENCE THROUGH LEARNING OUTCOMES IN TIER-II ENGINEERING INSTITUTIONS LOCATED IN TIER-3 CITIES AND RURAL AREAS

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**ABSTRACT-** Achieving excellence in Tier-II engineering colleges located in Tier-3 cities and rural areas is really a challenging task. At least one out of six engineering college is located in rural area and about 10% of engineering colleges are located in Tier-3 cities. Thus, based on current number of engineering colleges 25% of engineering colleges are located in Tier-3 cities and rural areas. Colleges located in these locations are categorized as Tier-3 colleges. A study shows that, student enrolment to these institutions is less than 50% and in some it is about just 20%. The study cites numerous reasons for poor admissions.

This paper makes an attempt to bring forth all possible factors which are the main obstacles in achieving excellence. Some of the factors that significantly contribute to the failure to achieve excellence are: poor infrastructure, failure to institutionalize best practices and internalize quality culture and policies of regulating authorities. Above factors along with others are discussed in this paper. Also, few suggestions are made by the authors to achieve excellence.

**Key Words:** Excellence in engineering education, Learning outcomes, Tier-3 cities, Rural areas

## 1. INTRODUCTION

Competent technical man power is one of the main ingredients for the progress of the nation. In pre independent India, not many institutions were there to provide technical education; few institutions established by the ruling British were meant for the benefit of British to implement their own schemes in India. Because of industrial revolution in the west, lots of manufacturing industries started functioning.

Realizing the important role of science and technology in the nation's progress; post independence; our leaders gave lot of emphasis on science & engineering education to meet the technical manpower requirement of India. As a result of this, today there are as many as 3500 engineering colleges functioning in various states of the country. Geographically, 3500 number of engineering colleges are not uniformly distributed. Few states such as Andhra Pradesh, Maharashtra, Tamil Nadu, Karnataka, Madhya Pradesh and Uttar Pradesh have highly populated engineering colleges. As a result of establishment of large number of engineering colleges the quality of engineering education has become a matter of concern. To address these concerns, and bring in quality and excellence in engineering education autonomous bodies like National Board of Accreditation (NBA) and National Assessment and Accreditation Council (NAAC) came into existence. The main objective of these boards/councils is to define criteria/parameters that help in achieving the set benchmark by focusing on new philosophy called Outcome Based Education (OBE), which is student centric. This new philosophy is different in many aspects compared to traditional system of engineering education. OBE model focuses on measuring student performance through learning outcomes. Learning outcomes are the statements of what a learner is expected to know, understand and/or be able to demonstrate after a completion of a process of learning. In other words, learning outcomes identify what the learner will know and be able to do by the end of a course or program. Learning Outcomes mainly include knowledge, skills and attitudes. Main focus of OBE remains on evaluation of learning outcomes of the course/program by stating the knowledge, skill and behavior a graduate is expected to attain upon completion of a program.

The OBE system laid more emphasis on learning outcomes (program outcomes) which are based on the graduate attributes (GA) of 21<sup>st</sup> century. The GAs include: deep knowledge of the discipline, critical thinking & problem solving, team work & communication skills, leadership qualities, professionalism, ethics and life-long learning. The required knowledge and skill sets for a particular engineering degree is predetermined and the students are evaluated for all the required parameters (outcomes) during the course of the program. NBA and NAAC strongly believe that the new system/model will help in bringing high quality in engineering education system.

Still after implementing OBE model, only 15% of the graduates are employable (national employability report, 2016 and AICTE reports), graduates fail to gain new skills; large gap exists between industry and academia. In the following sections, we are discussing about the pros and cons of OBE model, challenges the institutions located in rural and tier-3 cities are facing in implementing OBE model or achieving excellence through OBE model and finally some suggestions to fix the problems.

## 2. ROAD BLOCKS TO ACHIEVE EXCELLENCE

The OBE model aims at providing the necessary knowledge, skills and expertise that industry demands through learning outcomes. Following are the key skills expected by the employers (NBA).

- a. Engineering knowledge
- b. Problem Solving Skills
- c. Design/development of solutions
- d. Investigation
- e. Modern tool usage
- f. The engineer and society
- g. Environment and sustainability
- h. Ethics
- i. Individual and team work
- j. Communications
- k. Project management and finance
- l. Life-long learning

The big question is, whether the Tier-II engineering colleges situated in tier-3 cities and rural areas will be able to deliver all of the above skills to the graduates and make them employable. The answer is “No”. The barriers to impart above skills to students are as under.

### 2.1 Curriculum

Curriculum is one of the important parameter/criteria in achieving the excellence through learning outcomes. The curriculum in Tier-II institutions is designed by affiliating universities. There is always complaint from the employers that the curriculum is not industry relevant and it is not updated to suit industry requirements. Also, least efforts are made by the institution to identify the gaps and bridge them. Hence, in first place the curriculum should be designed in such a way that it is in line with graduate attributes and learning outcomes. There is lot of ambiguity among stake holders regarding outcomes and curriculum; whether goals (outcomes) have to be defined first and then curriculums are to be designed or design the curriculums first and then define outcomes. What is the correct way? Important question to be addressed is: whether curriculum really matters in achieving excellence? This challenge is to be addressed by the regulating authorities.

### 2.2 Mindset of stake holders

National Board of Accreditation and other accreditation agencies are making efforts to bring in excellence in engineering institutions through learning outcomes. A report says that only 10%-15% of the engineering colleges in India have obtained accreditation from the accreditation agencies. The main reasons for this poor parentage are:

- Accreditation agencies have failed to reach all the stake holders and convey the importance/benefits of implementing OBA & OBE model.
- Institutions know little about OBE and are reluctant to implement it.
- Institute managements are not aware about this new concept.
- Essential criteria of OBE are to be satisfied; which require sufficient funding and institutions are not willing to spend.
- Even after getting accreditation status there is no significant improvement in the performance criteria of the institution.
- Failure to implement Outcome Based Model in total.
- Difficulty in changing the mindset of stakeholders, particularly management and teachers.

Changing the mindset of main stake holders is really a challenging task.

### 2.3 Attempt to implement foreign model in Indian institutions

The origin of OBE may be traced in United States of America (USA). The OBE model was developed and implemented in USA in nineties. Later on it spread to Europe, Australia and Asia. After receiving lot of critics, Australia moved away from OBE and towards a focus on fully understanding the essential content, rather than learning more content with less understanding. Since India became the permanent signatory of Washington Accord (WA) in 2014, it is enforcing the OBE model in engineering, management, Diploma, Pharmacy disciplines. The enforcing agencies have made minimum efforts to study the pros and cons of implementing OBE model in Indian education system. Also, the agencies have failed to convince the stake holders about the benefits of OBE; how it helps student community at large. There is wide gap in the status of institutions in foreign nations compared to Indian institutions in terms of infrastructure, student intake, and teacher quality. Challenge here is that of accepting the foreign model (as it is) and implementing it in the native system.

### 2.4 Geographical location of colleges.

As mentioned earlier, about 25% of engineering colleges are located in Tier-3 cities or rural areas. These places basically lack the following:

- Big/Small industries in the vicinity of the colleges
- Connectivity by road/rail/air
- Poor quality of students
- Adequate physical infrastructure
- Qualified and experienced teachers

- Modern tools
- Research facilities

The colleges located in Tier-3 cities or rural areas are really in a vicious circle. The concessions/relaxations in the mandatory requirements provided by the regulating authorities are the reasons for setting up colleges at these locations. Other reasons being less land cost, lower cost of living. The student admissions to these institutions are 50% or less than 50%. In such situations, college administration fails to provide rich infrastructure, quality education through experienced faculty and better training & placement. Top recruiters hesitate to visit colleges situated in these cities/areas. Consequently, the college management shows less interest in institutional developmental activities. Colleges located in Tier-1 and Tier-2 cities are the preferred destinations for rich and high rank students. Students taking admission in rest of the colleges are from rural background, belonging to low income group and have average or below average academic records. Regulating authorities (particularly AICTE) have failed to check the availability of mandatory and desirable infrastructure and facilities at these institutions. In such situations it becomes really challenging to achieve excellence both for institutions and regulating authorities.

### 2.5 Policy of Regulating Authorities

All India Council for Technical Education (AICTE) set up in India with an objective of promoting quality in technical education and regulating and maintaining norms and standards. The stake holders of AICTE year after year granted engineering colleges whoever asked. No norms were followed while granting new colleges. The authorities failed to study the demand of technical graduates by Indian industries, didn't bothered about the density of colleges being granted for a particular area. Other unscientific policies initiated by AICTE are:

- Granting more student intake (120, 180, 240 etc) per branch without considering the requirement by the employers.
- Alternate ways introduced to enhance student intake (shift courses)
- Recently, making staff student ratio as 1:20 instead of 1:15
- Strict monitoring of engineering colleges for the requisite facilities is not happening on regular basis; as the approval process in online.
- Making 45% marks as minimum eligibility in qualifying examination (XII Standard) for engineering course.

In the event of the entire above, how it is possible to bring quality in technical education and achieve excellence. Today, engineering profession has lost its charm and not considered as a lucrative.

### 2.6 Evaluation Process

The regulating authority; AICTE has to be blamed for the current pathetic situation of engineering education in India. Other stake holder to be blamed is affiliating university. Both have utterly failed to formulate and implement stringent norms necessary for maintaining high quality. The objectives of achieving excellence or high standards are just on papers not in reality. Not many efforts have been made by AICTE to bring in high quality in engineering education; except few recent initiatives.

National board of accreditation assess and evaluate the learning outcomes in terms of attainment of Course outcomes (COs), Program Outcomes (POs) and Program Specific Outcomes (PSOs). Until recently many colleges were not aware of methods to assess and evaluate learning outcomes. It is failure on the part of NBA of not properly educating institutions about the evaluation process. It organizes programs in metro cities and charge hefty fees, which managements are not ready to pay.

Institutions located in tier-3 cities and rural areas are really in a helpless situation with respect to assessment and evaluation of learning outcomes i.e OBE. NBA has restricted itself to tier-1 and tier-2 cities. Then, how is it possible for colleges located in tier-3 cities and rural areas to achieve excellence.

## 3. CONCLUSIONS

Authors wish to make the following suggestions to achieve excellence through learning outcomes.

- Curriculum is to be designed keeping in mind the requirements of industries; minimum gap should be there between academia and industry.
- Curriculum should be made more flexible.
- Faculty development programs must be organized on regular basis; sufficient funds must be made available for such events.
- Government authorities should fund institutions located in Tier-3 cities to establish centres of competency.
- Institutions located in Tier-3 cities and rural areas must be attached to a nearby reputed institution or an industry.
- National Board of Accreditation should put more efforts to reach all institutions to educate them about NBA evaluation and assessment.
- AICTE should revise its policies on granting institutional approvals, faculty norms, student intake etc.
- A comprehensive study of situation of institutions located in Tier-3 cities by regulating and accreditation agencies is must.
- The initiatives of MHRD, AICTE, NBA and other reputed institutions framed to bring in quality in engineering institutions are not reaching the institutions located in Tier-3 and rural areas; efforts must be made in this direction.
- Is it a wise decision by central authorities to grant permission to start engineering institutions in locations which lack of all resources? Concerned authorities should ponder.
- It is high time to bring in huge change in Indian Engineering Education System.

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