

## 62. Changing Trend of Engineering Education

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As we all know Engineering is the application of science. Unfortunately, the teaching practices followed in majority of Engineering institutions seem to be ironical. Many of today's discipline-oriented, research-intensive universities curriculum are not really designed for students to experiment in the true sense of the world. Henceforth the problem-solving skills are not enabled or truly speaking ignored.

According to All India Council for Technical Education (AICTE), out of the eight lakh graduate engineers from technical institutions in the country, more than 60 per cent remain unemployed in India. This is an alarming fact which seems to be the threshold for me to write this article.

Now we are in the cross roads of Engineering education. The need for an engineer to have both technical and social expertise is vital. According to the Mann report in 1918, the role of the Engineer must involve the following.

Apply scientific principles to production, Manager, provide technical advances to larger economic system, Member of a team that includes management and technicians, Advance technical breakthroughs, Leadership. Tackle societal problems

and according to the Grinter report in 1955.

Preparation of the Engineer should have a focus on the following.

- ❖ Learn science.
- ❖ Apply science in mechanic arts.
- ❖ Managerial skills.
- ❖ Build character.
- ❖ Predominately technical.
- ❖ De-emphasis of social.
- ❖ Two tier system undergraduate and graduate.
- ❖ Technical preparation in social context.
- ❖ Able to function on a team.
- ❖ Function within social-technical system.
- ❖ Leadership and management. Hence Mann and Grenter are alike in their conclusions. As my article is to suggest something for the preparatory session of an engineer let me list down some of the practices to be adopted in teaching.

Preparatory course for the educators are necessary to keep in pace with the rapid changing trend of the employability needs of this education. Faculty development programs should be implemented regularly for the educators on weekly basis or fortnightly in the form of technical training and industrial visits.

Universities and the affiliated institutions should be scheduling this FDP as a part of their job responsibilities. Also, sufficient and flexible time slots should be given as a choice for undergoing these tasks to motivate them for continuous learning process. Assignment of class works and lecture or demonstration hours should be judiciously scheduled. When the educator is motivated and encouraged for his efforts and participation the same will be reflected in their classroom teaching. This again becomes a positive aspect of the trainer and he will tend to take forth the same level of encouragement and appreciation to the students. Hence the effective professional development skills of the educator have a direct impact on the teaching process. This should be the role played the management of the institutions to keep their employees well informed.

The class room / lecture sessions seem to be boring. this is a general feedback of the students irrespective of their disciplines of education. Identification of factors to improvise the sessions should be a major concern to rectify this draw back. Now goes the role of the professor or educator who delivers the lecture in the class. The professor may start with a motivational quote or an interesting incident in the history of engineering, relevant to the topic to be handled on that day. The session should be interactive according to the level of complexity of the subject or topic. Surprising facts and recent trends or advancements related to the topic can be told or explained in between the lectures before switching over to the sub topics. Attention seeking quiz or rapid-fire rounds can be conducted at the end of the session for a time

period of 5 minutes especially for theoretical subjects. This will help the class to recollect the information shared during the lecture. Also, the class can be indirectly insisted to participate by providing some weightage or marks which will contribute towards their internal assessment.

Once in a week class room seminar can be given to students who lack in social behavior of not mingling with the class during the learning hours. This will be an act of encouragement or motivation to those kinds of students who cannot be expected to volunteer themselves in classroom participation. This exercise will try to bring out their social skills. The highest benefit of this practice could be identifying the leadership in them and the least of it might workout as well in honing his/her communication skills as a team player. Both aspects are needed for a budding Engineer to survive and sustain in the evolving trends of the Engineering Industry.

Management role of an Engineer is vital in the industries. Project Management must be an integral part of the curriculum. The institutions generally choose the skilled students and assign such tasks for conducting curricular/cocurricular events. The major part of the class will be silent observers with nil participation. Instead class of students can be divided into teams and the major task can be segregated into minor tasks with some specified responsibilities for each team. These projects could be an ongoing work inside the campus or preparing some educational models for their labs or a social relevant project in their community which is of minor duration say 2 to 3 months.

These types of assignments keep them aware of their social responsibilities together with an exposure for project management.

The demanding trend in the employment sector is that it is looking forward for a skilled candidate in a specific area rather than for an all-rounder with academic brilliance. Hence industry specific technology-based training is an important requirement for students. Minimum of one such training per semester must be provided to the students. This can be done directly by industry tie-ups or by the professors as facilitators supported by the industry. Make-believe concept of learning always succeeds.

To put it in a nut shell the teaching practice should be modified in such a way that the direct participation or involvement of students must be the core of the education system around which the modules are to be designed throughout the learning period.