

## 15. ENGINEERING EDUCATION IN INDIA: NEED FOR PEDAGOGY, QUALITY, AND PROFESSIONALISM.

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### *Abstract*

In this paper, some observations on the present scenario of the engineering education in India are presented- the mindset of management, the Heads of Institutions and, particularly, the faculty. It is argued that the need for engineering education in India is for pedagogy, for quality consciousness and for professionalism at all the three levels; namely, management, the Heads of Institutions and the faculty members. Some measures for education and training: for pedagogy, quality, and professionalism are proposed. Necessity for massive campaign at the national level is emphasized. A strategic plan with a time schedule attached to it is proposed. Adoption of the philosophy of Total Quality Management for all quality efforts is strongly recommended.

### 1.0 Introduction

Today, we have in India, more than 3000 engineering colleges and an equal number of polytechnics. Every year, more than 25,000 to 30, 000 seats remain vacant in most of the Southern States where total students-intake in institutions – engineering colleges and polytechnics, is more than 1.0 lakh to 1.5 lakhs. Still, more engineering colleges and polytechnics are being approved, every year, by AICTE. Neither the States, nor the Directors of Technical Education nor the Universities, seem to worry about this state of affairs. Are we concerned only with providing access or are we also concerned about quality of education? We are knocking the gates of the Washington Accord for the last more than 5 years, with only provisional membership in our pocket, but no efforts are seen to be made either by AICTE, State DTEs, nor the Vice Chancellors, that are responsible for administration, conduct of

engineering education system of the country, striving for enhancing the quality as prescribed by the Washington Accord. The NASCOM reports that only 20 % of the engineering graduates are employable. This is a very pathetic situation known to everybody, including those responsible to take immediate steps to rectify the situation. But all are silent and the situation continues to be what it is, from year to year. Still we harbor the dream of “*India to be Super Power by 2020*”.

### 2.0 The Ground Reality

One who is concerned with the situation, and takes a stock of the Engineering Education system, as it is being practiced today, will soon realize that the system totally lacks in four aspects:

- i. Pedagogy
- ii. Quality

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- iii. Professionalism
- iv. Educational leadership

### **2.1 Need for a training course pedagogy.**

Pedagogy is the art and science of teaching. It is very important at the primary, secondary, and post secondary level. In India, every teacher teaching at the pre-primary, primary and secondary level has to undergo training at different levels. A high School teacher, for example, has to undergo the B. Ed course when he becomes eligible for teaching at High School. But, for a lecturer at Junior college or at undergraduate level, such as a pedagogic training or even a short term course, is not considered as necessary.

The IGIP – The international society of Engineering Education based at Austria, Europe has developed such a course leading to – IGIP International Engineering Educator title. With this title, an engineering college teacher at UG or even PG level will have acquired necessary pedagogic expertise to teach at polytechnic or engineering college. We, in India, must design such a course and make it mandatory for our lecturers in engineering colleges and polytechnics. Such a course can be even conducted through Distance Education Learning mode or through our Open Universities, spread across the country.

### **2.2 Need to induct quality aspect in all engineering disciplines**

India is a developing country and hence, access and quantity are being aimed at. But only looking to quantity is not correct; along with quantity, quality has to be taken care of. Otherwise, the quantity will become a difficult problem to handle at a later stage. But this is not being realized. The management is concerned only with expansion of their colleges by adding new branches every year, even though that college has not yet faced any accreditation like NBA. Principals are immersed only in their routine activities. The employers are only

complaining about the lack of soft skills necessary in the graduates seeking employment; everybody is only confined to his own compartment and nobody feels the necessity of coming out of his box and to have a dialogue with the different organizations working in the Engineering Education system and thus, the show goes on, from year to year. We only talk about the dream of India to be super-power by 2020 but take no steps to achieve it. Our application for full membership of Washington Accord is pending for more than 5 years, all that we did is to raise our standards of accreditation criteria to satisfy the Washington Accord requirements, have taken no steps to see that our institutions try to induct quality and get accredited by NBA. Unless, the standards of the engineering colleges go up in a visible way, by getting accredited according to the latest revised NBA standards, how the Washington Accord authorities will grant us its full membership?

A massive programme for quality induction, maintenance and enhancement of quality in our engineering colleges has to be taken up, involving all the concerned authorities—AICTE, Vice Chancellors, State Directors on one side and the managements, principals and faculty on the other. And this programme has to be tagged with a time frame, along with a regular monitoring system.

### **2.3 Need for Professional Awareness amongst the Faculty**

A very few engineering teachers realize that they belong to two professions: one, the engineering profession and the other the teaching profession. We adopt teaching profession to train our students to become engineers. They have to note that teaching is not an occupation but a profession. For a profession, it is obligatory that we provide the best possible education to our students so that they fulfill the needs of the Employers, Government and Society. There is professional ethics and code of conduct, which the

professionals have to observe, strictly. It is also the duty of the professionals to enhance their procedures and practices on a continuous basis and this can be done, only by the professionals and not by any other outside agency.

The policy makers and administrators of India have to meet these needs that our engineering teachers badly require today, if the faculty is to contribute fullest to provide the most competent, professional experts, capable to become the drivers of the engines of growth and development of economy, social welfare and the nation. After all, an engineer is one who has to use Science and Technology to solve the global problems of education, health, environment, etc.

### **2.4 Need for Educational Leadership**

Every Engineering college and Polytechnic needs leadership to bring about the changes, mentioned above. This leadership should and must be provided by the Principal along with the Management. The Management should, at least, give full freedom / a free hand to the Principal to bring out these changes. But at the same time, it should monitor and check the changes being made, if necessary with the help of the advisors and consultants.

Principal should know that to bring about changes is a team work; he should involve all the staff of the college, explain them his plan of action, objectives - short and long term goals - he has set for the Institutions and how he is going to achieve these. The staff must have a feeling that they are part of the planners and also implementers of the process of change that there are working for. It is then, they will take pride in the work and put in all their efforts, untiringly. With this method of working, every Institutions is bound to achieve the goals, set by them.

The Principal should also know that an Institution cannot grow, in isolation. It must develop or join a network of other Institutions working on the same lines, so that they can grow together, synergetically. The Engineering

Education Foundation, Pune has put forth the idea of Consortia of Engineering Colleges and Polytechnics, both at the State and National Level for synergetic growth. Such networking will definitely make an impact on the Quality and Standards of Engineering Education both at State and National Level.

### **3.0 Empowerment of Faculty**

As I recommend the policy makers and administrators to take steps for providing inputs to faculty, in respect of pedagogy, quality and professional awareness, I feel the faculty has to play not just a passive but an active role. Every faculty member must decide to keep in mind that he must always work for enhancement in his professional performance. He should find out what it is to be good teacher and criteria for becoming the Best Teacher. Such criteria can be obtained from the Best Teacher competitions announced by the organizations like ISTE and the other, Engineering Education Foundation. The faculty must maintain a record and always try to enhance their curriculum vitae and monitor it, at regular intervals.

At the same time, principals and managements should make it a point to apply for such a Best Teacher Awards Competition regularly, year to year. The institutions may not get any award but a system gets placed in the institutions, where the faculty is made aware of the necessity of building up professional expertise, besides attending to their normal duties as a teacher. A record has to be maintained in respect of the progress made by each faculty member, monitored regularly by the Heads and Principal. The management may announce the Best Teacher Awards for their institution, every year and celebrate the individual achievements. This will result in a constant attempt by all the faculty members to go on improving, on a continues basis. This will help for individual growth and development of *faculty in respect of their professional performance* and when the faculty grows, institution automatically has to grow and

develop. But unfortunately, at present, our management and principals do not take such an enlightened view and avoid entering into such competitions.

#### **4.0 The Need: Think Tanks and Quality Cells for Every Institution**

The present tendency is that both management and principals are satisfied if the show goes on: admissions are full; faculty engages classes as per the scheduled timetable prescribed by the University, students appear for the examinations and results are declared which are on the whole okay. There is no urge to improve, to know what it is to bring in quality, to benchmark best practices. Since accreditation by NBA is not mandatory, institutions are not particular about preparing for accreditation and get accredited. Neither the State Directors nor the Vice Chancellors keep a watch on institutions in respect of NBA accreditation. Hence, the necessity for a Quality Cell and Think Tank for every engineering college and polytechnic.

##### **4.1 Quality Cell**

The principal should establish a Quality Cell by selecting a few senior staff members and he should lead this cell. These members of Quality Cell should study the concept of quality; help the faculty to become quality conscious and try to induct quality by choosing an appropriate philosophy and methodology. I would personally recommend, Total Quality Management philosophy for this purpose. The cell should also adopt, benchmarking Best Practices and monitor a progress made by institution regularly. Help of experts and consultants, should be taken for this purpose.

##### **4.2 Think Tank**

Another cell should be established with a task of thinking about one's own institution, its objectives, formulate its own vision and mission, short term and long term goals and lay down

systems and procedures for achieving this. They should study/keep a watch on how other institutions, both at State level and National level, are progressing. They should note new developments in the education practices, check their validity for adoption for their institution and induct these, in their institutional working.

#### **5.0 Need for NGO's in the Field of Engineering Education**

We have the MHRD, the AICTE, the State Directorates of Technical Education and Universities, working in the field of Engineering Education; but these are all Government organizations. They have a chalked out line of action and a set mandate. They never go beyond that. Therefore, there is always a gap between what should be done and what is being done and this gap can be only filled up by the NGOs in the country.

The NGOs have at least a few dedicated workers with a passion to work for a Quality and Excellence, an urge to serve in an earnest way and their mandate is flexible. They have great potential, which can be unleashed provided they get encouragement and recognition along with some financial assistance from the Government. There are only a few NGOs in the field of Engineering Education, like the ISTE, New Delhi and the Engineering Education Foundation, Pune, and may be a few others. Government must pay a special attention to these Institutions and help them to exploit their full potential. Government should also keep a watch on these NGOs, lest they might indulge in doing only routine work, year to year. Government can help such NGOs in implementing new ideas e.g. Every State needs a staff training Institute for training for — Pedagogy, Quality and Professional awareness amongst the Engineering Education faculty. Either the Government should establish such Institutes or help the NGOs in establishing these Institutions. Similarly, many other ideas can be implemented with a little encouragement and

financial assistance, through such NGOs. This can also be called Public Private Partnership (PPP).

## 6. The Way Ahead

For all this progress to happen, management should not only lead but facilitate and monitor the working of institution and ensure that institution is progressing in the right direction.

I may recommend here notes prepared by the Engineering Education Foundation, Pune: (Please refer [www.eefedu.in](http://www.eefedu.in))

- i. Centre of Quality and Excellence
- ii. The consortium of Engineering Institutions leading to the formation of the State level Federation of consortia and then the National consortia.
- iii. Benchmarking of best practices.

With this and a time bound schedule - say of 5 years, a planned and dedicated effort made

in a co-ordinated way by all the stakeholders will completely change, nay transform, the education scenario in India and make it vibrant and dynamic system, marching towards Global Quality and Excellence.

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