
12. QUALITY ENHANCEMENT IN TECHNICAL EDUCATION BY INCORPORATING INNOVATIVE RESEARCH ASPECT

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Introduction

With the onset of recovery of global economy, the trade, commerce, and industry have picked up a growing path world wide. The human resources, along with financial and infrastructural resources, have gained tremendous importance and strategies are being developed to meet the rising needs. The competent and skilled manpower has proved to be a trend setter in the world of business for wealth generation from knowledge. Every country is planning to create human resource in required quantity and quality with different skills to meet the demand of the industry. It is also aimed to maintain the growth rate and create a high momentum in the economy. This has created crucial responsibility for the planners in the education and training areas. To meet this, experts have created documentations such as National Education Policy, reports of National Knowledge Commission, Planning Commission papers, University Grants Commission Plan Guidelines etc. The focus point in the studies is to generate enough competent manpower through quality education. There has been phenomenal growth of education sector in India with setting up of large numbers of institutions, universities, colleges, etc. which is still growing very rapidly. There are about 600 Universities including State, Central & Deemed to be Universities, 20,000 colleges, about 15 IITS, 50 NITs & 10 IIMs, 2,000 Engineering Colleges, Polytechnics,

Management, Computer Institutes etc in the country. The interest among the students are mainly towards Engineering and Technology programs followed by Management which resulted in the growth of these institutes. However, the increase in number has not been matched by the quality output. Though there are norms and standards, guidelines prescribed by the Apex Bodies like AICTE, UGC, University, from time to time, still the quality of competency of students remains to be a matter of concern. The quality of the technical education needs to be evaluated on various parameters and the teaching-learning process.

Quality in Technical Education

When the focus is made on under graduate programmes in Engineering and in Engineering and Technology offered by the institutes in the country, the quality of the students coming out depends upon number of parameters which are listed below.

- Infrastructure
- Governance and Management
- Curriculum Aspects
- Teaching – Learning methods
- Human Resource
- Research Consultancy

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- Finance Resources
- Extension Services
- Students Support and Progression
- Healthy Practices
- Library & Learning Resources
- Professional Acitivity
- Alumni, Parents interaction
- Placement

The objectives of the programs and their outcomes are dependant on the adequacy and quality of these parameters, which will result into level of information, knowledge, analytical skills, thinking ability, competence, professional & communication skills of the passing out students. Though the syllabus of any two institutes are almost identical, still the quality of the passing out students differ. The quality can be measured by these parameters along with the ability of the students to shoulder the responsibility successfully in the world of work after the graduation. Though the parameters are broken down with finest possible details, it is the spirit and dedication with which the duties related to these parameters are delivered which becomes the most important aspect. This has resulted into a focus on teachers who play crucial role in creating the desired manpower. The faculty needs to update regularly to create a dynamic teaching-learning process.

This aspects has a combining effect in teaching and research. The concept of research in teaching for quality improvement is a new concept which is required to be tapped innovatively.

Research component for teaching quality enhancement

The undergraduate students of engineering discipline are taught variety of subjects spread over four years of the course through theory and practical. The students also undertake a project

in their final year. However, when these students start working in industry, they face problems related to scale of operation, technology used, economic aspects of the commercial activity etc. They become bit confused about their capabilities earned during their studies and the job responsibilities, they have to shoulder. Moreove, to become successful in their career, they need to contribute to their jobs through innovative and creative approach. To build up these capabilities among students, research component is to be effectively integrated in their studies to improve quality of teaching. The research aspects can be evolved through following methods:-

- Incorporating a Mini Project at prefinal year. This will allow students to undertake any project of their interest outside the syllabus. This offers students an opportunity to bring out their talent and think creatively and innovatively.
- Extended laboratory work in practical. This involves designing and conducting experiments on variety of parameters to understand processess which are normally carried out in the industry. This helps students to improve their hands on experience and laboratory skills.
- To understand the methods to deal with environmental aspects
- Critical analysis of available literature to update their knowledge

These research components, when included in the teaching learning process, help students to build the capacity for understanding techno commercial importance in the world of work. This involves optimization of operation, improvement in productivity, reduction in product losses, protection of environment, enhancement in product quality, energy conservation etc. The students become aware of the recent developments in the fields and can take the job comfortably.

Conclusion

The engineering students require to develop ability for innovative thinking during their undergraduate studies for meeting the challenges in their studies through different methods. This offers possibility of creative

development by the students in various fields.

The quality of technical education can considerably be improved with this approach and can meet the global challenges effectively.

