

Chapter 11

Some Important Aspects to Enhance the Quality of the Technical Education System for Better Industry– Institute Interaction

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ABSTRACT

The outcome of technical education system is fresh engineers/technicians who are the backbone of the industrial sector. It is the responsibility of faculty members, institutions, and industries to enhance the quality of this outcome to (a) achieve higher production rate and (b) manufacture the quality products to satisfy the customer needs in the global market. It is essential to update the curriculum, Teaching-Learning (T-L) process, and practical skills of faculty members according to the industrial requirements. This chapter presents different important aspects that can be scientifically implemented in technical education systems to escalate the quality of fresh engineers/technicians. The quality deciding factors are: industrial exposure to faculty members through the industrial case studies, inclusion of interdisciplinary subjects in the curriculum, implementation of structured project work, and planned industrial training for students. Another important element is to create the research and development environment in polytechnics and engineering colleges to inculcate the research capabilities amongst the students. In each aspect of this chapter, flow diagrams, models, implementation methodology, role of faculty members, students, institutions, and industries are presented and discussed. These aspects facilitate to generate intelligent, multidisciplinary skilled, and innovative technical manpower. Thus, the fruitful industry-institute-interaction can be achieved.

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INTRODUCTION

Recently, industrial sector is passing through a competitive phase in the global market due to rapid industrialization, technological developments, and multinational policies. Industries are adopting highly advanced, automatic, and sophisticated technologies in their manufacturing processes and plants. Hence, industries are demanding the practically skilled and talented technical manpower i.e. fresh technicians and engineers with multidisciplinary skills and working capabilities (e.g. Mechatronic System, Agricultural Electronics) (Joshi, 1997, 1999, 2004a, 2004b, 2006; Olafuyi & Adewole, 2005; Joshi & Joshi, 2006; Velumani & Ganesan, 2005; Singh & Joshi, n.d.; Habash, Suurtamm, & Neculescu, 2011; Chang, Chen, Kuo, & Shen, 2011). Another important aspect is the requirement regarding technicians/engineers varies from industry to industry. Polytechnics and Engineering colleges are the primary elements of technical education system, which imparts the technical education to produces the fresh technicians and engineers to cater the needs of industries. These elements impart the technical knowledge and practical skills to the students so that they can perform their jobs effectively and efficiently in the industrial sector. Industries are expecting the intelligent, multidisciplinary skilled and motivated technicians/engineers to work at the various departments such as design, research and development, production, maintenance, process, marketing etc. to produce high quality products up to the satisfaction of the end user or customer. It is always discussed that there is gap between the expectations of industries from technicians/engineers produced by engineering colleges and polytechnics regarding practical knowledge and skills required in industries. The opinion of industries is that fresh technicians/engineers are lagging in designs, practical knowledge and multidisciplinary skills. In technical education system, in addition to the infrastructure that is laboratories, equipments, machineries, class-

rooms, and library there are various parameters through which this gap can be bridged (Joshi, 1997, 1999, 2004a, 2004b, 2006; Olafuyi & Adewole, 2005; Joshi & Joshi, 2006; Velumani & Ganesan, 2005). These aspects are: (a) to enhance the quality of students through project work and industrial training; (b) to update the quality of faculty members through industrial case studies; (c) to update the curriculum by incorporating the interdisciplinary subjects; (d) to create the research and development environment in the polytechnics and engineering colleges. These aspects help to improve the practical knowledge and skills of students and faculty members ultimately this will be definitely helpful to meet the requirements of industries. The objectives of this chapter of the book are to understand the aspects that are helpful to enhance the quality of fresh technicians/engineers to fulfill the needs of industrial sector for better industry-institute-interaction. Apart from the regular teaching-learning process, the faculty members and staff members should be processed through the following important aspects essential for the enhancement of the quality of technical education.

1. Role of quality functions in technical education.
2. Industrial case studies- Need for faculty members in technical education system.
3. Need of Interdisciplinary Subjects in the curriculum of technical education system.
4. Implementation strategies for student project work in polytechnics and engineering colleges.
5. Industrial Training of Students in Technical Education System.
6. Creation of Research and Development Environment in Polytechnics and Engineering Colleges.

This chapter is organized into six sections that cover the six aspects as listed above. Each section comprises the concept, flow diagrams and tables

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