

# Enhancing the Employability of Students' Passing from Technical Institutions

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**Abstract** India has the world's second largest education system and provides one of the largest pool of skilled manpower. In the recent years, the problem of under-employment or rather unemployment among technical and professional engineering graduates & diploma pass outs is a cause of serious concern. Substandard Institutes are producing mere graduates & diploma holders instead of technically sound and competent professionals as intended. These pass outs are either under- employed or if employed, they do not fulfill or meet out the expectations of Industries or organizations. There is immediate need to take few corrective measures by the academic coordinators, policy makers and management of the institutes associated in providing technical manpower to the industries system; otherwise India will face an explosion of unemployed technical graduates/diploma holders. The world of academia will have to understand the nerve of Industries/organizations and require producing true professionals instead of mere graduates/diploma holders. The paper principally focuses on the multiple ways and means with suggested strategies for the technical teachers as well as institutions to plan, practice and administer such innovations in to their daily instructions, so as to fulfill the gap to a large extent.

**Keywords:** Employable Skills, Generic Skills, Communication Skills, Teamwork Skills, Problem Solving Skills, Initiative & Enterprise Skills, Planning & Organizing Skills, Learning to Learn Skills, Technology Skills, Self Management Skills, Learning to learn and not teaching environment, Industry Institute Interaction, Instructional Pedagogy Plan of Implementation, Assessment of Practical Skills, Quality Improving Tools.

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## INTRODUCTION

**T**echnology of the Indian Industries has influenced the Change in the Industrial world. The influence of this change due to global economy has affected our day-to-day life from last two decades at different forms and approaches. To make the engineering graduates most suitable to cater to the current needs of the employment market, it is necessary to provide them



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recent technology supported knowledge, practical skills and desirable social and working attitudes. In this context what has been reviewed is given ahead. Agrawal (2005) Number of engineering colleges increased from 50 in 1950 to 157 in 1980 and then 1346 in 2005. Furthermore, intake in these institutions also increased significantly. Whereas in 1950, average intake per institution was 74 students, this has increased to 180 students in 1980 and further rose to 336 students in 2005. The growth of Technical Education before independence in the country has been very slow.

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Porter (1994) has brought out in a joint study performed in support of Confederation of Indian Industries (CII), the weaknesses of Indian Industries in their ability to compete with global corporations. This has made them to review and face the day to day challenges such as providing good quality, variety, and availability of desired quantity product in the field of manufacturing, marketing and services.

Chopra & Suri, (2005) pointed out that the quality and quantity are complimentary to each other. At present to meet out the challenges emerging after globalization and liberalization, there is need of both the quality as well as quantity. But the fact cannot be denied that the knowledge society demands the global standards quality with desirable attitudes in engineering graduates. There is always a gap in the quality intended and received in the students passing from the technical institutions.

Prem Vrat (2003) expressed that Technical Institutions are facing complex and wide range of challenges and are frequently being asked to meet the demands of the society, high responsibilities that depends upon the quality of academic staff, engineering degree programmes, students as well as basic infrastructure and academic environment.

Abdul Kalam (1994) has quoted this situation in these words “ like shooting a moving object”. Further pointed out the technological challenge due to globalization, exposes us to global competition in technical education. This means that the Engineers and Scientists have to be continuously trained in the emerging & upcoming technologies which we all are likely to face in days to come. Engineering education is made to be useful which has to impart skills of tomorrow and not of yesterday.

Bhaskaran, (1994) there is dire need to bring about some changes in the job profile of engineers of the day in technical education system. This severe change in the character of engineering profession is because of the increasing automation in the industrial processes.

Jha (2005) addressed certain global issues of the engineering education, in particular after India’s membership of WTO, agreement under GATE, and Washington Accord 2004 that we are required to produce engineers who are

capable of offering engineering expertise and services to any part of the globe, who would work individually as well as in international teams with multi-disciplinary expertise and diversified background.

ABET (2000) has suggested a new accreditation criteria and industrial requirement of engineering graduates competence. It is stressed that India is a supplier of the quality engineering manpower to the world, Indian Universities and Institutions must know these output /outcome criteria of accreditation, which is now prevailing in most of the developed countries.

India is flooded with mushrooming of the polytechnics, engineering and management institution in the last two decades. Employers and the stakeholders are in dilemma in selecting them. NBA (2011) raised the standards of accreditation. As a result of this all premier Institutes get the creamy layer of in-takes. Unfortunately substandard Institutes get non- creamy layer of in-takes who are just producing technical graduates having certificate but not required skills because of non quality practices. There is a need of following more stringent quality practices by institutes to overcome the weaknesses of students whereas institutes have poor quality management system producing only technical graduates instead of true professionals.

**Employable Skills required by the Industries** Employability Skills suggested below is based on extensive research conducted by the Department of Education, Employment and Workplace Relations in the year 2008 in India. There is a need for the course teachers' to compile such a list of under mentioned job specific skills to each sub skills area and accordingly bring changes into location based instructional strategies and delivery style.

**Professional Skills** Professional and technical skills that are relevant to be developed among students to acquire field of expertise are generally expected by the employers. Teacher may need to plan and implement reading/review exercises with implications of the research, projects and assignments. Studies among student also involve industrial placement work experience, Major or Minor Project dissertation, Field experience, on job learning based approach, internships or field work a range of practical experience from which teachers as well as students can also draw professional skills. Examples may include-

- “Devising a D. P. R. & business plan”,
- “Developing a Construction site lay out or
- “Conducting & analyzing clients' evaluation”.

**Generic Skills-** Employers also look for a range of transferable social or generic skills in potential employees. There are about eight desirable generic skills

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likely to be expected by the employers that have been identified by conducting the research to be possessed among the graduate. The skill headings are quite broad. It is so desired for the teacher to make sense to break each skill down into more specific as per the need.

Employability Skills under the Social & generic patterns are suggested below is outcome of an extensive research conducted by the Department of Education, Employment and Workplace Relations in the year 2008 in India.

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### **Communication Skills**

- Listening, understanding and speaking clearly
- Writing appropriately for different audiences
- Persuading & negotiating effectively
- Demonstrating empathy, assertiveness & tact
- Understanding the needs of customers/clients
- Establishing relationships & using interpersonal networks
- Sharing information & proposing ideas
- Fluency in English & other languages
- Logically summarizing information or data
- Chairing a meeting

### **Teamwork Skills**

- Working effectively with people of different ages, gender, race, religion or political persuasion
- Identifying the strengths of team members
- Recognizing own strengths & limitations
- Clarifying team roles & performing agreed tasks
- Demonstrating leadership as appropriate
- Coaching, mentoring & motivating others
- Giving & receiving constructive feedback
- Resolving differences of opinion
- Collaborating & contributing to team results

### **Problem Solving Skills**

- Analyzing facts & testing assumptions
- Defining the problem & contributing factors
- Developing creative, innovative &/or practical solutions
- Showing initiative in identifying & solving problems

- Solving problems independently & in teams
- Applying a range of strategies to problem solving
- Designing contingencies
- Developing & evaluating a range of options
- Making realistic decisions & action plans
- Using mathematics including budgeting & financial management to solve problems
- Resolving customer concerns in relation to complex issues
- Implementing & monitoring solutions
- Evaluating processes & outcomes

### **Initiative & Enterprise Skills**

- Identifying opportunities not obvious to others
- Assessing the competitive advantage of ideas
- Identifying customer or client requirements
- Developing strategic goals
- Being creative, initiating ideas & innovative solutions
- Determining the commercial viability of ideas
- Translating ideas into action
- Demonstrating political, commercial, environmental, cultural, etc sensitivities
- Liaising with stakeholders & sponsors
- Using a range of business communication methods
- Marketing & selling a product or service

### **Planning & Organizing Skills**

- Establishing clear & attainable project goals & deliverables
- Defining specifications & quality standards
- Planning the use of resources including time, people, finances & materials
- Risk management & contingency planning
- Managing time & priorities – setting milestones
- Managing tasks - delegating, coordinating, monitoring
- Managing people - training, developing, motivating, giving, feedback, supervising,
- Collecting, analyzing & organizing information
- Being resourceful, taking initiative & making decisions
- Establishing evaluation criteria & participating in continuous improvement
- Reporting on progress & outcomes
- Understanding basic business systems & their relationships

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### **Learning to Learn Skills**

- Managing own learning
- Sharing knowledge & experience in the workplace
- Contributing to the learning community at the workplace
- Using a range of mediums to learn – mentoring, peer support, networking, information technology (IT), Applying learning to ‘technical’ issues
- e.g. learning about products & ‘people’ issues
- e.g. interpersonal and cultural aspects of work having enthusiasm for ongoing learning
- Being willing to learn in any setting – on & off the job
- Being open to new ideas & techniques
- Being prepared to invest time & effort in learning new skills
- Acknowledging the need to learn in order to accommodate

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### **Technology Related Skills**

- Having a range of basic IT skills
- Applying IT as a management tool
- Using IT to organize data
- Being willing to learn new IT skills
- Having the occupational health and safety knowledge to apply technology
- Having the appropriate physical capacity, Self Management Skills
- Having a personal vision & goals
- Evaluating & monitoring own performance
- Having knowledge & confidence in own ideas & vision
- Articulating own ideas & vision
- Taking responsibility
- Working ethically
- Working under pressure
- Demonstrating resilience

### **Self Management Skills**

- Having a personal vision & goals
- Evaluating & monitoring own performance
- Having knowledge & confidence in own ideas & vision
- Articulating own ideas & vision
- Taking responsibility

## **Corporate Environment**

The prevailing trend of the Indian industries is to search for readymade and trained employees who may start to give output with immediate joining. Industries have cut their budget provision for spending on pre- training because of competition and high attrition rate. Academia world has understood this trend of industries and formation of sub-system like finishing school for a specific profession has been acquiring shape in right way. All the technical institutes like polytechnics, engineering, and architecture are required to upgrade institution to provide a corporate environment for its student. Seminars, Conference halls, Tutorial rooms are required to be renovated on the pattern of Industries training center. Incorporation of the ICT into education and training is required to be introduced. Instructional sessions of the expert from industries and field require delivering with latest learning teaching methodologies like Computer aided instruction enabled class-rooms equipped with the latest audio video teaching aids, online consultation, video conferencing facilities etc. Moreover, there is a need of providing training to the faculty and staff of the institutions to handle these modern gadgets and follow practice of corporate culture. There is a need to inculcate the culture of performing within deadlines. Concept of timeliness will enable the students to work under pressure. All these exercises will bring transformation into students and will evolve them as a true professionals.

## **Focus of providing Learning to learn and not teaching environment**

The Learning is permanent change in behavior as a result of practice or experience whereas teaching is a process of transmitting information on the various scientific concepts, principles, procedures and skills through specific strategies.

It is basically passing the knowledge to student through traditional teaching by chalk and talk in order to contribute changes in behavior. Whereas in the technical courses mainly interaction with challenging and new situations of learning is much more helpful to develop insight of learning. The curriculums referred in the technical, higher education comprises of various technical courses in any of the engineering discipline. The concepts and their principles dealt are so abstract in nature which are difficult to perceive by the student. A devoted and dedicated teacher make an additional effort in using media mixed methods to deliver the concepts and principles which enable learner to visualize or realize as they have seen them in actual. S/he prefers to implement the curriculum by better planning, designing, conducting and more often believing when s/he evaluates the initially intended learning out come by organizing a test or activity based field or library assignment. The final achievement of learning outcome should be in observable and measurable terms. In this case, it is more important for the institution to provide conducive environment of instructional

and communication technology to the teachers as well as students under the guidance to provide independent learning rather than teaching. The progression of successive stages of the curriculum implementation in terms of the ratio of teacher lead learning and independent learning should be as given in **Fig. 1:**

**Figure 1: Student Centered Approach**

Teacher Role	Teacher-Centered Approach	Student Role
<i>Information Provider</i> 	<b>Lecture (Walk &amp; Talk)</b>	<i>Monologue</i>
	Improved Lecture i.e. Lecture with Question Answer Techniques, Lecture with Assignment, Lecture with A-V Aids and other print & Non-print media resource material	<i>Dialogue</i> 
	Classroom/ Laboratory/Workshop Demonstration	
Facilitator 	Seminar and Panel Discussion	<i>Mutual Interaction Oriented</i> 
	Group Discussion	
	Case Study	
	Instructional Game	
	Simulation Exercises	
	Role play Exercises	
<i>Mentor, Coach and Guide</i> 	Industry/Field Visit/Assignment	<i>Observable &amp; measurable Action Oriented</i> 
	Laboratory/Workshop/ Field work	
	Project Method/Problem Based/Experiential learning	
<i>Counsellor</i> 	Self-learning	<i>Reflection Learning (Output Oriented)</i> 
	Multi-Media Learning Packages/Computer-Assisted Instructional packages/Learning packages (MMLP/CAI/CAL)	
	On-line Learning/On Job	
	<b>Student-Centred Approach</b>	

**Progression of instructional methods**

Practically in classroom teaching, skill practice is not occurring in this way under these newly setup technical institutions. It is presumed by the teachers

in the current days that the syllabus given to them by the institution or the University is somehow to be covered in the eyes of the administrator. Though they just touch the topics or discuss with the students without bothering about their understanding of the relevance of the concepts, theory, procedures and principles. Thus, they are focusing more on teaching and due importance about students' learning has not been taken care of. The teaching-learning environment is mostly teacher centric with students having less important role **(Bhattacharya)**.

In present System usually junior faculties are employed at lower level. They fail to inculcate the standard learning teaching habit among the students and therefore students lose their interest because of de-motivating syllabus oriented lecture. Moreover, even the faculty in these colleges is not well versed as far as learning and teaching aspect is concerned. Most of the faculties are freshers, college pass outs, who just take over the teaching profession on a temporary basis. So they stand far away from providing quality education to the students, partly because they are not familiar with several aspects of educational technology and psychology of learner. They lack in training on the use of different methodology of teaching & learning including techniques of creating interest and conducive learning environment as well as motivational factor. Ultimately poor teaching learning practices make the product just to somehow pass the university examination but loose the potentiality of getting employment. A student passing such courses from the universities/colleges does not stand capable of estimating their potential in comparison to the requisite market capability and job relevance. They feel that just a professional degree and a high score would earn them a good job; furthermore pass out from colleges ending up into non employment or underemployment.

### **Industry Institute Interaction**

The pass out of the technical institutions are input of the organization and/or industrial system and hence their requirements and expectation about the pass outs is much more important. Introducing the technological Universities in the country has brought some changes in the curriculum as applicable to the entire state. The engineering institution involved in providing technical education courses in the country have been implementing the curriculum of all such university more or less in isolation from Industry or field exercises. Today, the focus of the Industry changes for professionals who have learned to learn skills at a pace that does not hamper the overall productivity levels expected. Most of the Industries have cut down their training after employment budget. This practice is alarming all academia to make judicious mix of foundational concepts and other pertinent skills with industrial or field

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experiences. Academia and industry are rapidly inching closer to each other to create synergies. Sustainable partnerships between academia and industry are essential to produce a new generation engineers – with broader skills with experience, serious business acumen and heightened awareness of the world outside the classroom (**Gopal**)

Many of the standard institutes has made collaboration with industries of their region by forming alumina in association with local chapters of the Indian Society of Training & Development (ISTD), Confederation of Indian Industries (CII). Some of the industries itself has entered into opening their Management driven Industrial Technical Institutes/polytechnics/engineering colleges. Industry like J.K. Cement, L & T and Indo German Tool Room are setting examples. The pass outs of these institutes get direct employment. Their curriculum is also different in comparison to others; thereby they generate technical man power as per their requirement. Top notch Institutes need to build their industry interface because of their intellectual and infrastructural capability to provide technical test consultancy, certification of product and research support to adjacent industries. One of the positive approach may be for such institute to affiliate them with few professional organization such as AIMA, IE (India), IETE,CSI,IEEE etc. in some way which may help them in establishing closer relations to industry. Besides this endeavor technical institute and their faculty members should organize the Industry tour for their students, identify industrial problems and training needs of the industries. Conduct industrial need based sponsored programme for the industry personnel/officers which will enhance their working capability and industrial productivity. Such as CRISP programmes, IBM academy program, Cisco Academy program, NICs Computer Oriented programme, IBM Shiksha Abhiyan, etc. which will enable institutions to enhance their relations with the adjacent industries and improve bonding. Participation in exhibitions, panel interviews, technical seminars and regular expert lectures by industry leader will be good way to come mutually closer to the industries. This will certainly make their product technically sound, knowledgeable, skills oriented and employable.

The curriculum must be designed keeping the requirement of industries in mind and be updated regularly as per the needs of the industries. Courses should be more project & problem oriented so that students may get more practical and implementation exposure.

In fact Institutes/Universities of abroad have similar course design. Every theoretical module is followed by problem based or project module in which students are required to implement the knowledge and skills, which they have acquired. It's a practical fact that project oriented approach viz –a-viz CDAC specialized programmes makes the student more employable. Institute should

provide corporate learning environment right from the beginning so that its product may adapt quickly with industries after passing their degree.

In the West and even in few top-notch technical institutes in India there is culture of Industry placement of student for a year or 6 months in between their courses, which really fills the gap between industries and academics. Merely doing few weeks of industry training or just managing such a training certificate at the end of course for getting the degree will not serve the exact purpose of Industrial training concept.

### **Instructional Pedagogy Plan of Implementation**

Usually these institutes don't have any standard teaching plan. Instead of having a full pedagogy plan they are supplied only a copy of the syllabus that also happens to be ill defined in terms of prerequisite for subjects, depth of the content to be discussed, instructional objectives to be achieved, learning outcome, activities to be undertaken by the student, list of experiment and their individual integration to the learning practical skills, safe practices etc. This is one of the major aspects of bringing quality movement in technical education and further more improvement in it will bring the expected quality in teaching learning practices. There is a need of well-defined or unambiguous syllabus, which should include the objectives, learning outcome, required practical work, and required hours of independent learning, no. of lectures, tutorial etc. In a nutshell there is a need of better teaching and learning strategies, which will improve the accountability of teacher and taught and further improves the quality of education. Equally important is the fact that with suitable tactics these strategies are required to be implemented carefully. The modern quality management system for education have prescribed for up keeping a separate subject file by lecturer consist of Scheme of work (Weekly plan of execution of syllabus), Student Assessment Information sheet (components of assessment details with weightage, date of delivery & return), Lecture log sheet, end of module report (Module appraisal tool) etc. require to be audited by auditor regularly.

### **Assessment of Practical Skills of students' work**

In most of technical institutes the field work, laboratory work and workshop practical work is not given much importance. As a result there is a need of improvements in the traditional assessment style and it should meet the requirement of the industries of the concerned branch or discipline of the students' employer.

There is need to evolve a Cognitive, Practical and Generic or Social skills assessment system including the assessment of the processes associated in

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performing the skills for a particular laboratory/workshop experiment being conducted/likely to be conducted by the student in the laboratory/workshop and the integration of the productive output and/or learning outcome after performing the particular experiment into industrial situation.

Certain cognitive development of the student is required to be assessed in the criterion like methods of observations of the results obtained, drawing inferences, findings after calculations, conclusion after finding results, interpretations after observation of the reading, interpolation and extrapolation of the data received after conducting experiment, finding fault if not receiving accurate results after calculation, suggesting mistakes occurred in experimenting and give remedial measures for safe practices etc.

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Basic Skills Performance indicators for all the requisite skills like handling/holding equipment, aligning equipment, taking measurement, noting observations, adding/pouring liquids/acids/base in to jar/burette/pipette, parallax removing, calculating etc

Certain essential and desirable attitudes while performing these skills like safety cautiousness about self, others and instrument/machine, housekeeping work, self initiativeness, proactiveness, adjustment to work in group, sharing knowledge and belongingness with others in a group, work ethics, sincerity, punctuality and honesty needs to be drawn in terms of idealistic performance as expected in the industry, including essential and desirable attitudes.

There should be more group work to improve the ability of team building and leadership quality, capability to handle problem individually and independently, work to develop the decision taking ability, presentation of proposal for improving the presentation skills on the specific problem. We require to improve the quality of instructor involved in making this assessment of the students. All such identified persons are to be trained in planning, organizing and conducting the assessment practices.

The purpose of giving field practices and field assignments to the students after teaching a particular topic through lectures is to help them understand the topic better through solving a few related numerical and practical problems. Students are required to do more live projects, case studies and implementation of solution of problem as their curriculum practical work. These exercises will definitely help them to become employable.

### **Application of Quality Improving Tools**

Application of improving tools is general quality management principle for all organizations. But especially these institutes are essentially required to change their face by applying quality improving tools. In principle the concept like TQM, Quality Circles, Workgroup activity, ISO-9000-2008, NBA

Accreditation, Academic Audit, Internal and/or External Academic Monitoring within institutions are found very effective in many of the technical education system of the different state. These systems may be studied and it can be implemented in a modified form to suit the need of our own system.

Besides these, it is also essential to establish a full- proof and transparent mechanism in the Institutions' education system. The activity like, regular meeting between all academic faculty and staff within the department, periodical meeting between faculty members, staff and management, regular interaction between the class teacher and class representative, Transparent mechanism of on line feedback collection system from the student, team teaching, peer observation of lecture, training of faculty members and supporting staff by outside established agency/expert, performance based rewards may prove helping tools for improving the quality of teaching & learning with improved retention of quality faculty. To attract and retain good teacher's opportunities for research, development and offering industrial consultancy should be promoted which not only would satisfy the teachers' need but also would enrich their teaching-learning. Scholarship scheme for meritorious students will be some of the best tools for increasing the satisfaction level of all stake holders.

## CONCLUSION

Technical Institutions in the field of engineering are opened up with a purpose of providing technological and social man power with huge investment of funds and multiple efforts of the similar minded persons. Main focus of the Government to create and provide technical manpower to the country for uplifting the economy and bring social and economic revolution in the country. But, when the very purpose of the Government and Technical Institution is not accomplished due to under employment and un-employment. It is very painful experience for both to have unemployed graduates and youth. Newly established Institutes are required to think differently to make its product employable as their intake requires more input to make them true professional.

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