CHAPTER-6

TECHNOLOGY TRANSFER BETWEEN INDUSTRY AND INDUSTRIAL TRAINING INSTITUTES

As the engine of economic growth, technology transfer plays an increasingly important role in nation’s ability to prosper and grow. Technological innovation is the mechanism through which technology can be leveraged to create wealth and contribute toward a better quality of life. Institutes should take cognizance not only of the increasing importance of technology as a basis for competition, its determining role in international competitiveness and the contribution it can make to the social related goals of the nation’s Development Programme- such as health, housing, infrastructure, education, environment and also the increasing need to manage technology strategically and operationally. With a strong, vibrant and relevant institutes products could support and sustain the national innovation strategy, the industry will be found wanting in the global competitive arena.

To provide the actual technology transfer with world standard training facilities and skilled manpower as per demand of industries. Following steps should be initiated with the help of IMC:

1) Institutional Management
   - More autonomy to be provided & more managerial staff at assistant level is to be increase.
   - Management Information System (MIS) & Quality Management System should be implemented more effectively and efficiently.
   - Managerial staff has to be given Executive level training.
   - To make cluster of industry.
   - Survey for MES

2) Teaching/Training Staff
   - Existing Staff development by advance training
   - Recruitment or Contractual of new qualified staff
• Guest lecturers are to be invited for specific topics

3) Teaching/learning resource

• Modern library as required
• Advance training Centrex for staff
• Interaction with industry

4) Training facilities

• Modern machineries
• Building civil & electrical work are to be renovated
• Audio-video aids for theory / laboratory

5) Linkage with the labour market

• Feed back from employer
• Survey of skill-set require for industry
• Development of an appropriate Labor Market Information System that will assess trends in labor market demand, identify emerging sectors and skill mix requirements.
• To develop and Implement procedures and systems for monitoring outcomes effectively, e.g. Tracer Studies, Employer’s Studies.

6.1 SHARING OF TECHNOLOGY WITH TRAINED FACULTY

To have proper technology transfer between Industry & Industrial Training Institutes should have following parameters/actions:

6.1.1 Short and Medium Term Actions

• A format for faculty skill assessment: academic and co-curricular.

• Areas of interest of faculty members in terms of cultivation of new skills.

• Motivation to faculty for involvement in various co-curricular initiatives and activities.
• Faculty skill assessment by industries, consultants.

• Faculty skill enhancement programs.

• Industry visits by faculty.

• Faculty visits to industrial exhibitions (procedures be specified)

• Training on student advisor-ship

• Industrial training to faculty.

• Identify subject experts among different ITIs to impart training to trainers.

6.1.2 Micro Level List of Skills Required by Industry

• The micro level list should be first prepared by IMCs and will be fine-tuned after getting the inputs from Industry.

• “Industry Ready” Output

• Mock interviews by industry at the middle of the term to assess deficiencies and to recommend remedies.

• Training to trainers to handle skill gaps on a longer run.

• Placement of students in the industry for 2 weeks per term.

• Constitute “Industry Interface Cell” (Objectives, Budget, Processes, Team) (One faculty 10 Industries.)

• Faculty motivation for Industry Interface (Incentives, recognition, awards).

• Skill wise certification of trainees by Industries.

• Industry visit of trainees and faculty to understand products, processes and plant.

• Training modules for supportive skills: Communication, Reporting, Customer Service.

• Assessment of faculty by the Industry to identify requirements for skill enhancement.

• Industrial training to faculty 1 week per term.

• Industry ready certification by Industry
6.2 TRAINING RELATED ISSUES

6.2.1 Trades Available

A survey was conducted by FICCI revealed that the number of trades offered by the participating ITIs ranges from 2 to as many as 38. When seen in the light of the fact that the total number of government approved trades is 107, shows that there exists a major deficiency in terms of the capability of the ITIs to ramp up their scale and offer new and more market oriented courses.

Feedback obtained by FICCI shows that a majority of ITI courses are in basic industrial trades, such as electrician, fitter, welder, wireman, mason etc while the non-traditional trades responsive to the emerging labour market needs such as commerce, insurance, personal services and IT related trades remain under represented. Given the existing excess supply in the labour market for the basic trades, encouragement to the ITIs in offering non-traditional courses would be of strategic importance to make the ITI’s in India effective in imparting skills with strong labour market Linkages.

Table 6.1: List of trades offered by the surveyed ITIs

<table>
<thead>
<tr>
<th>Trade</th>
<th>Proportion of ITIs offering the trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrician</td>
<td>86%</td>
</tr>
<tr>
<td>Turner</td>
<td>79%</td>
</tr>
<tr>
<td>Welder</td>
<td>79%</td>
</tr>
<tr>
<td>Machinist</td>
<td>71%</td>
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<tr>
<td>Fitter</td>
<td>71%</td>
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<tr>
<td>Motor Mechanic</td>
<td>71%</td>
</tr>
<tr>
<td>Refrigerator &amp; air conditioner mechanic</td>
<td>57%</td>
</tr>
<tr>
<td>Electronics</td>
<td>57%</td>
</tr>
<tr>
<td>Wireman</td>
<td>50%</td>
</tr>
<tr>
<td>Computer operator &amp; Prog. Assistant</td>
<td>43%</td>
</tr>
<tr>
<td>Job Category</td>
<td>Percentage</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Grinder</td>
<td>39%</td>
</tr>
<tr>
<td>Sheet metal Worker</td>
<td>39%</td>
</tr>
<tr>
<td>Stenography</td>
<td>39%</td>
</tr>
<tr>
<td>Carpenter</td>
<td>36%</td>
</tr>
<tr>
<td>Instrument mechanic</td>
<td>36%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>36%</td>
</tr>
<tr>
<td>Mechanical m/c tool maintenance</td>
<td>29%</td>
</tr>
<tr>
<td>R&amp;TV</td>
<td>29%</td>
</tr>
<tr>
<td>Diesel mech.</td>
<td>29%</td>
</tr>
<tr>
<td>Plastic processing operator</td>
<td>29%</td>
</tr>
<tr>
<td>Plumber</td>
<td>21%</td>
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<tr>
<td>D/Civil</td>
<td>21%</td>
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<tr>
<td>Cutting sewing</td>
<td>21%</td>
</tr>
<tr>
<td>Tool and die mechanic</td>
<td>18%</td>
</tr>
<tr>
<td>Moulder</td>
<td>18%</td>
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<tr>
<td>Millwright</td>
<td>18%</td>
</tr>
<tr>
<td>Painter</td>
<td>18%</td>
</tr>
<tr>
<td>Mason</td>
<td>18%</td>
</tr>
<tr>
<td>Surveyor</td>
<td>18%</td>
</tr>
<tr>
<td>Draftsman mechanic</td>
<td>11%</td>
</tr>
<tr>
<td>Secretariat Practice</td>
<td>11%</td>
</tr>
<tr>
<td>Desk Top publish Operator</td>
<td>7%</td>
</tr>
<tr>
<td>Foundry man</td>
<td>7%</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Course</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanic Maintenance Chem. Plant</td>
<td>7%</td>
</tr>
<tr>
<td>Dress Making</td>
<td>4%</td>
</tr>
<tr>
<td>Hair &amp; Skin Care</td>
<td>4%</td>
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<tr>
<td>Clock &amp; watch</td>
<td>4%</td>
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<tr>
<td>Photography</td>
<td>4%</td>
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<tr>
<td>Driver cum mechanic</td>
<td>4%</td>
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<tr>
<td>Data Entry Operator</td>
<td>4%</td>
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<tr>
<td>MOCES</td>
<td>4%</td>
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<tr>
<td>Mech. Medical electronics</td>
<td>4%</td>
</tr>
<tr>
<td>Industrial Automation</td>
<td>4%</td>
</tr>
<tr>
<td>Auto CAD</td>
<td>4%</td>
</tr>
<tr>
<td>Personal Computer Maintenance</td>
<td>4%</td>
</tr>
<tr>
<td>Analog and Digital Electronics</td>
<td>4%</td>
</tr>
<tr>
<td>Wireless Operator</td>
<td>4%</td>
</tr>
<tr>
<td>Attendant Operator Chemical Operator</td>
<td>4%</td>
</tr>
<tr>
<td>Mechanic Tractor</td>
<td>4%</td>
</tr>
<tr>
<td>Armature Motor Rewinding</td>
<td>4%</td>
</tr>
<tr>
<td>Certificate in e-commerce</td>
<td>4%</td>
</tr>
<tr>
<td>Certificate in software programming</td>
<td>4%</td>
</tr>
<tr>
<td>Two wheeler repairer</td>
<td>4%</td>
</tr>
<tr>
<td>Horticulture</td>
<td>4%</td>
</tr>
</tbody>
</table>
Figure 6.1: Trades offered by the ITI's as per FICCI Survey

- Electrician
- Welder
- Fitter
- Painter
- Survey
- Personal Computer
- Mechanical Machine
- Modular
- Instrument Mechanic
- Diesel Mechanic
- Stenography
- Hair & Skin Care
- Photography
- Data Entry Operator
- Personal Computer
- Chemical Operator
- Analog & Digital
- Ref. & AC Mechanic
- Two Wheeler repair
- Certificate in E-comm
- Mechanical Maintenance
- Secretary Practice
- Certificate in E-comm
- Hair & Skin Care
- Photography
- Data Entry Operator
- Personal Computer
- Chemical Operator
- Analog & Digital
- Ref. & AC Mechanic
- Two Wheeler repair
- Certificate in E-comm
- Mechanical Maintenance
- Secretary Practice
- Secretary Practice
6.2.2 Diversified Trades and Courses

as per survey following actions required to diversify trades and courses:

- Industry specific training programmes at ITIs and at Industries (including industry extension, using the infrastructure provided by the industry).
- New trades Cell to explore, identify, propose and commence new trades.
- Different admission criteria or a different batch for employed personnel. New trades and courses should be offered for students as well as employed workforce.
- Short term courses to cover technology supplement to catch up with developments.
- State and Central level ITI meets and Internet forums to exchange information about new courses.
- Issues related to new trades and courses to be handled by a state level or central level committee with IMC participation.

6.2.3 Availability of Machines

While in majority of the Industrial Training Institutes surveyed are having machinery as per requirement for the trades offered by the institute; the number of machines not in working conditions as a proportion to the machines available in the institutes ranged from 1% to as high as 53%.

Figure 6.2: NC/CNC machines available in institutes
All the participating institutes from the Western region reported to have Placement cells in their institutes. The trainees are mostly employed by various manufacturing industries under the scheme of ATS. Some of the institutes like the ITI Mahad (Maharashtra), have set up Common Facility Centers in their respective institutes with the facility services being provided to the trainees from outside. Job opportunities, as reported by some of the respondents, are often provided to the trainees by the local industries directly through the Institute Management Committees (IMCs).

6.2.4 Hours of Practical Training

Nearly all the training institutes responding to the survey reported to have met the practical training requirement of the students. Of the total 2184 hours of training per year including both theoretical and practical schedules, hours of practical training per year is required to be 1456 hours as per the NCVT norms. Only an insignificant proportion of institutes were able to meet this requirement with shortage of electricity and shortage of raw materials being the most important factors behind the shortfall.

6.3 FUSION

To have proper interaction between institutes & industry a new concept called ‘FUSION’ should be introduced institutes with the help of IMC.

FUSION is the network between industry and academia. The network enables knowledge and technology transfer, supporting business innovation and increased capability. FUSION develops and supports 3-way partnerships and projects between:

- Companies-private sector businesses with technology-based development needs.
- Knowledge Centres- third level institutes such as colleges, universities, institutes, technology or research centres.
• Knowledge Carriers - high-calibre degree/diploma holders graduated within the last 5 years.

### 6.3.1 How can FUSION help Industry?

FUSION can help an industrial unit:

• Solve a technology-based need
• Develop new and innovative products or processes
• Improve manufacturing processes
• Improve quality
• Reduce costs
• Enhance design capabilities
• Enter new markets

### 6.3.2 Benefits for Partners

FUSION, although driven by company need, has obvious benefits for all partners.

• Company: provides solutions to technology-based needs leading to increased business performance and competitiveness.
• Knowledge Centre: enables enhanced levels of industry-based research.
• Knowledge Carrier: offers industry-based training and fast-track career advancement to senior management.
Full benefits for each of the partners are outlined within the FUSION pack.

Chart 6.1: FUSION

INDUSTRIAL TRAINING INSTITUTE

- Identify Education & Training Needs of the Industry
- Identify the benefits of Cooperation
- Provide resources
- Learn More About Industry

INDUSTRY

- Identify Education & Training Needs
- Identify benefits of Cooperation
- Provide resources
- Learn More About Institute

Constitution of IMC

- Share Common Perspectives
- Identify Training Needs
- Develop Mission statement
- Determine membership & Funding
- Identify common goals
- Develop organizational Chart
- Develop operation/Consensus decision Process

Notification of delegated powers to IMC

- Prepare Written Agreement
- Document Goals
- Identity Success Measures

Develop Collaboration Processes

- Course Proposal Requirement
- Registration
- Marketing

Implement Collaboration Activities

- Courses
- Seminars
- Conferences
- Certificate/Degree Program

Evaluate Collaboration Activities

- Provide metrics collected about training program effectiveness to industry partners
- Evaluate Financial Performance & Customer satisfaction
- Document Lessons Learned

Reviews & Update the Collaboration Process

- Review Goals
- Review Governance & communications structure
- Measure & Improve Processes

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Partnerships are driven by company need. Within each 3-way partnership, partners work collectively to develop and implement a solution to a technology need within the company. Each company is partnered with a knowledge centre with specialist expertise in the area required. The knowledge centre provides one-to-one tailored assistance to solve the company’s technology project. A high-calibre graduate/diploma holder is also based in the company to spearhead the project. This knowledge carrier operates as the link and agent for technology transfer between the company and knowledge centre. In essence, a dynamic and shared tri-partite project is formed between the company, the knowledge centre and the knowledge carrier, all working towards the joint business project.

6.4 CONCLUSION OF THE CHAPTER

Placement of the ITI passed should not only ensure strong technological expertise to support the innovation and technology management-related issues, but also the institute staff and students are supposed to get the benefits directly from the institute’s activities. It is essential that the new breed of ITI passed should produce a wealth creating mindset and an underlying understanding of the importance with principles of technological innovation and the management technology. Technology transfer is a fast-growing activity and has received substantial attention from governments, industry, and institutes. Technology transfer usually involves some source of technology, group which posses specialized technical skills, which transfers the technology to a target group of receptors who do not possess those specialized technical skills.