

CRITICAL SUCCESS FACTORS LEADING TO MEANINGFUL INDUSTRY INSTITUTION INTERACTION IN THE INDIAN SETTING

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Introduction :

The intended purpose of Technical Education System is to cater to the manpower needs of the potential employers - the industry. Since industry is the 'consumer' of the 'product' of this system, the industrial needs should determine the qualities and characteristics of the 'Product'. In view of this, a close collaboration between industry and the technical institution is imperative.

India has now established one of the largest technical education and industrial system. These systems are almost working in isolation with low interaction between them. There exists a large gap between the expectations of industry and quality of pass-outs. Though this fact has been accepted by all those concerned with these systems, no substantial effort has been made to bridge this gap.

National Policy on Education (1986) and its Programme of Action has spelt out the policy directives, redefining the role of technician education including the infrastructure and service sectors and broader nature of actions needed to implement the policy directives. This subject has found an important place in the NPE. A satisfactory scheme

to initiate and nurture industry- institution interaction should take into cognizance various inherent inhibiting factors and also the critical success factors that are very essential for sustaining the collaboration for a longer duration.

The main aim of this paper is to focus its attention on the Indian experience in this subject and describe the critical factors which lead to the successful interaction between industry and institution.

Growth of Technical Education System :

Technical education is one of the most significant components of Human Resource Development Programme of the country. During the last four decades, there has been a phenomenal expansion of the technical education in terms of number of institutions, intake and the disciplines.

At present a large number of technical institutions are preparing manpower at the following three levels:

The first level of technical education produces skilled workers for the industry. About 1580 Industrial Training Institutes (ITIs) offer certificate courses to about 0.26 million students annually. The entry to the

above courses is after 10+ (8+ in some cases).

Polytechnics offer second level of technical education programme leading to the award of diploma certificates. The passouts are designated as technicians. Admission to such courses is after 10 years of schooling. The duration varies from 3 to 4 years. 746 polytechnics (Govt. and Private) offer diploma programmes admitting about 1,15,000 students annually in 90 engineering and nonengineering disciplines. A few institutions also conduct programmes at post diploma and advance diploma level. Technicians are employed in the industry at the middle level supervisory positions.

The third level of technical education at the degree and higher levels is offered by 289 engineering colleges (Govt. and Private) and institutes of technology admitting about 58,000 students annually. The duration of degree level courses is 4 years after 10+2. The annual admission for post-graduate and doctorate degree courses is about 6600 and 300 respectively. 110 colleges affiliated to different universities offer post-graduate courses. Some of these post graduate institution are deemed universities.

Four Technical Teachers Training Institutes (TTTIs) including the one in Bhopal were established in the mid sixties. These institutes offer long term inservice teacher training programmes leading to the award of diploma, degree or post-graduate qualifications in technical education/training.

These institutions also undertake project consultancies, research and short term training programmes in areas like - curriculum development, instructional resource development, media development, education research, management, measurement and evaluation, laboratory instruction and development, policy analysis and research,

industry-institution interaction and computer education.

Growth of Industrial System :

The Indian industrial scene is as impressive as technical education system. Today, India is one of the largest industrial country in the world with respect to range of manufactures and the technology level. During the last three decades, tremendous growth has taken place in the industrial system in all the sectors, like Public, Private, State Governments and local bodies, Central Government, small scale industries, cottage industries and young entrepreneur development because of the favourable governmental policies, availability of manpower, easy accessibility to technology and Conducive environment in the Country. The Country is now self-supporting as far as heavy machinery, machine tools, petro-Chemicals, drugs and pharmaceuticals, textiles, Chemicals and fertilizers, heavy electrical plants, automobile and transport vehicles, electronics and communication systems, steel, forest products, etc. is concerned. To support this industrial expansion, infrastructures like power, transport, communication, and industrial estates have been developed in a big way.

The Critical Success Factors :

It has been observed that there are certain crucial factors, the existence and operation of which makes the interaction between Industry and Institutions more meaningful and permanent. Some such factors have been identified after analysing the case studies of several institutions and experience of the author in this area.

These critical success factors are :

1. Leadership
2. Institutional Autonomy

3. Resources (Human and Physical)
4. Dynamism of Industry & Institution.
5. Overcoming Resistance to Change.
6. Extrinsic Motivation
7. Proximity to Industries.

These factors have been described below :
Leadership :

Leadership is perhaps the most crucial factor in promoting and sustaining the industry institution interaction. The task of establishing viable linkages with industry demand quality of leadership, tact, persuasiveness and professionalism on the part of Principal and Heads of the Departments. When they lack such qualities, the experiments of interaction have failed and it is the institution which is always blamed.

Careful studies of the case histories of the institutions mentioned above, have highlighted some specified leadership behaviour patterns responsible for meaningful interaction. These can be summarised as :

- i) Successful and dynamic leaders have used different styles of leadership depending upon the situations. Styles approximation to being Directive, Supportive, Participative and Achievement - Oriented have been regularly used by the Principals of these institutions.
- ii) Stability of leadership has promoted consistent growth in the collaborative efforts in contrast to frequent leadership changes.
- iii) Considerable delegation of authority to Heads of Departments, Training and Placement Officer and senior faculty members becomes a source of encouragement and motivation

which in turn leads to better planning and execution.

- iv) Providing reward and recognition to subordinates also motivates them to take initiative towards fulfilling the goals of interaction.
- v) Confronting with the difficulties rather than avoiding them creates a healthy environment for better interaction.
- vi) Anticipating and planning for potential implementation problems leads to less chances of failure and thereby causes less frustration amongst the faculty.
- vii) Taking reasonable risks and helping the juniors in actions involving high risks facilitates undertaking of innovative industrial projects.
- viii) Exploring the possibility for resource generation is found to be helpful in promoting interaction.
- ix) Dynamic Leadership gets reinforced by successful performance, particularly with respect to risk taking ability.

Institutional Autonomy :

The design and establishment of an organisational system is a key factor in undertaking innovative activities with industries. The conventional structure has been found, on many instances, to be inadequate by itself to meet the needs of growth. To promote an intensive interaction with industries, the technical institution has to design a suitable infrastructure. This could be an addition to or reorganisation of conventional structure.

In India, there are only a few technical institutions which have considerable autonomy (specifically academic autonomy)

and others are Government controlled institutions having very little autonomy.

Autonomy brings, alongwith it, a higher authority to the management structure of the institution. The accountability to management and public in general increases and the leader becomes answerable for many of his decisions and actions.

It has been noted that majority of autonomous institutions have developed deep and long term relationship with industries. Government institutions depend upon external agencies for resources and sanctions. Government institutions are not directly accountable to the public.

Some of the specific factors which have promoted interaction are:

- i) The academic autonomy enables the institution to redesign the curriculae in consultation with industry, innovate and adopt appropriate teaching-learning processes and perform all such functions which are essential to promote interaction.
- ii) The autonomy motivates the institutions to establish an internal mechanism by identifying the working groups (infrastructure) as interdependent sub-systems along with their main responsibilities. These proactive working groups are responsible for diagnosing needs and problems of interaction, generate solutions for problems or decide strategies for need fulfillment, and implement solutions quickly.
- iii) In most cases the working groups have learnt to perform their jobs by trial and error and with perseverance and commitment thereby stoutly meeting the challenges and resolving the problems of interaction at various levels and in different phases.

- iv) The autonomous institutions develop the capacity to use the autonomy purposefully by making channels of sanction and communication more accessible and generating and deploying resources to a considerable degree.
- v) In successful Government Technical Institutions, the leaders are dynamic and use more of their professional and personal authority rather than formal authority.
- vi) To promote and sustain interaction the institutions while formulating the policies laid great emphasis on team work.

Resources (Human and Physical) :

A motivated and committed faculty is very crucial for the success of any collaborative effort. The role of faculty is not only to design, execute and evaluate the teaching-learning process in the institution but also to establish personal contact with professionals from industries and formulate suitable interactive approach. It has been observed that whenever an institution is held in high esteem by industry, the task of establishing and developing cooperative relationship has become less difficult. To increase the corporate reputation of the institute, the competence, level of motivation, commitment and active involvement of the faculty becomes most important. In short, the role of faculty should be viewed as teacher-cum-manager-cum-change agent.

To perform this difficult and challenging task, the successful institutions have initiated the following actions :

- i) To increase the competence of the faculty, staff development plans are formulated and sincerely executed. It has now become a regular activity.

- ii) The faculty having no previous industrial exposure have been sent to industries to gain the necessary industrial experience under various available schemes.
- iii) Staff deployment is normally made on the basis of skills, expertise and interest of individual faculty. Encouragement to staff in applying skills has become the responsibility of the Heads of the Department.
- iv) In the autonomous institutes which have some 'administrative autonomy', a provision has been made for an attractive career development for the faculty. This has reduced the faculty turn over and acted as nucleus for increasing the motivation level of faculty and obtaining more commitment. The Government institutes are still struggling with this problem.
- v) Challenging innovative industrial projects undertaken by the institutions have further increased the intrinsic motivation of the faculty.
- vi) Procurement of new physical resources and optimum utilization of the existing resources has made the job of the faculty simpler increasing the high student and industry contact.
- vii) Technical Teachers' Training Institutes, institutions of higher learning and industries have acted as major facilitators for all their developmental activities.

Dynamism of Industry and Institution.

The success of interaction of institution with industry will depend on the active involvement of industry on the one hand, and on

the other the initiative, enterprise and commitment of a technological institution. It is a two way process in which industry stands to benefit from the expertise, experience and resources available in the institutions as well as institutions derive benefit from the industry in various areas of collaboration. Therefore, establishing an understanding between industry and technological institution has become essential in respect of the objectives, processes and outcomes of the interactive projects. Realising this fact, the successful institutions have determined a new direction for their objectives and activities and acquired a different perspective from rest of the institutions in the country. Although, the significance of having meaningful links with industry has been projected by policy makers and in government directives and plans, only a few had translated these suggestions into sustained working relationship.

Not only the institutions but also the industry should realise the moral responsibility of developing the human resource requirements to meet the country's needs. The industrial establishment in the country can be classified as far as their interaction with the institutions is concerned as below :

- a) Establishments which have set up training departments of their own, identified the link persons and believe in interaction with institutions as their moral obligation for human resource development.
- b) Establishments which do not have separate training departments but believe in training and provide it through plant line managers and their assistants.
- c) Establishments which neither believe in interaction nor have any facilities of their own for the institutions.

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- d) Establishments which are not at all aware and concerned about their moral obligations.

The successful institutions have taken the benefits offered by the establishments of categories (a) and (b) above. Although, initially they faced a lot of resistance and unwillingness from the industry but their consistent effort and convincing strategies paid a rich dividend.

Overcoming Resistance To Change.

In the Indian setting, change is not the characteristic of educational institutions and majority of the industries. Some of the predominant change resisters acting in both the systems are :

- a) Organic desire to maintain balance i.e. security and permanence,
- b) Preference for the familiar rather than for the unfamiliar,
- c) Following a pattern set by tradition or practice,
- d) Selective perception and retention,
- e) Group identity or group behaviour restraining individuals following a different path,
- f) Lack of self confidence, motivation and sense diffidence, and
- g) Insecurity and regression.

The management of change and innovation is a complex process involving multiple points of intervention. This fact has been appreciated by the successful institutions. They adopted multi-pronged strategies to minimize the resistance to change. Some of these are :

- i) agreement on objectives and strategies of bringing about changes

and improvements by consensus and participation,

- ii) participative processes for decision making by frequent involvement of faculty adopted,
- iii) more freedom given to the faculty to select directions of work in tune with their interests and set their own targets derived from broader framework proposed by the management,
- iv) barriers to participation are overcome through breaking up faculty into levels and encouraging participation within the levels,
- v) counselling by the Principal as and when required,
- vi) establishing a problem-solving infrastructure and feedback mechanism within the institution,
- vii) involving personnel from the industries in various committees of the institution,
- viii) seeking guidance and assistance from the professional bodies of the country,
- ix) making the resources, expertise and experience readily accessible to the industries, and
- x) initiatives taken by the institution to establish linkages with industries followed by an experimental period when both the parties develop an understanding with each other and then intensive collaboration. Each stage demanded a very high degree of perseverance.

Extrinsic Motivation

In majority of the institutions the growth rate is steady incremental which relates to

gradual improvement in the conventional programmes or activities. In the successful institutions at some point of time major changes resulted in a sudden spurt of development in the area of collaboration with industries. The event of change could be appointment of a new Principal, the establishment of intimate link with facilitating agencies like TTTI or industry, announcement of a new government policy or project, progressive decisions of management, establishment of an industrial estate etc. There was more than one event of change in some of the institutions.

During this event of change, there was rapid growth and then stabilisation.

Proximity to Industries

Many of the technological institutions specifically the polytechnics are situated in the rural areas having no industries or very few small industries. All the successful institutions are either situated in the industrial towns or have easy access to the industries because of their autonomous characteristics or organisational structures having industrialists on their managing boards.

Present Status of Interaction

Only few institutions in the country have deep and permanent collaboration with industry in which operation of critical success factors as mentioned above can be observed easily. In other cases, the gulf between them is as wide as ever.

Numerous conferences, seminars and workshops were held at National and State level in the past to highlight the problems of industry-institution interaction. In these discussions barriers to collaboration have been identified and ways and means of promoting the interaction have also been recommended. Unfortunately very few suggestions have been translated into action by both the concerned parties.

Very few comprehensive researches have been carried out on this subject to make the reliable data available to educational planners and policy makers. Based on available research reports, case studies, conference papers and author's experience, salient points describing the present status of interaction in the polytechnics and engineering institutions are enumerated below :

Polytechnics

There are numerous possible activities in which the polytechnics and industries could collaborate with each other. Some of the important outcomes of TTTI Madras research (1982) are as follows :

- 1) Only 5 activities in which more than 50% polytechnics collaborate with the industry are :
 - a) arranging industrial visits for students (82%),
 - b) industries contacting institutions for recruitment of students (69%)
 - c) teachers being deputed for training in industries (65%) ,
 - d) industrialists participation in polytechnic functions (55%), &
 - e) talks from industrial personnel being arranged for students and staff (52%).
- 2) Private polytechnic collaborate more than the government counter parts.
- 3) Large polytechnics collaborate significantly more than small ones.
- 4) Institutions offering sandwich and/or post-diploma courses have significantly better collaboration than those polytechnics which do not offer these courses.
- 5) Polytechnics having industrial liaison committees have significantly greater

collaboration than those institutions without such committees,

- 6) The polytechnics from the Eastern and Northern regions of the country have comparatively poor collaboration as compared to the polytechnics from Western and Southern regions.

Engineering Colleges and Institutes of Technology

1. Indian Institutes of Technology (IITs) and few Regional Engineering Colleges (RECs) have deeper collaboration than the State Engineering Colleges.
2. Autonomous institutes have more collaboration than State Engineering Colleges.
3. Collaboration exists in consultancies, Product development, training of students and research areas
4. Few engineering institutions collaborate in the areas of exchange of personnel between institution and industry, curriculum and instructional resource material development and continuing education programmes for industrial personnel.
5. Technical Teachers' Training Institutes (TTTIs) collaborate intensively with industry in the area of training of teachers, curriculum development and evaluation, instructional resources development, research and consultancies participation in seminars, management and continuing education programmes.

Reasons for Low Interaction

The major factors constraining collaboration are:

1. Goals and objectives of education system and those of industrial system do not match fully.
2. Both the systems do not fully realise the mutual supportive and complementary role of producing manpower for national development.
3. Universities and Boards are still a closed system. The inherited traditions, values and structures of these are still acting as a barrier to interaction between institutions and industry.
4. A number of polytechnics are located in rural, agricultural, non-industrial or industrially backward areas.
5. Lack of sincerity and dynamism in leadership, low motivation of staff and students, and inadequate communication and resources.
6. Rigidity of rules and regulations, rigid curriculum and lack of autonomy.

Conclusions

There are evident shortcomings and deficiencies in the existing mode of interaction between industry and institution. This linkage is to be built up to the desired level of strength and utility. To make this linkage strong, meaningful and fruitful both the systems should understand the roles of each other and the operation of critical success factors. Each will have to supplement the other and make concerted efforts to overcome current problems and inadequacies.

There seems to be plenty of scope to carry out comprehensive research studies in this area to provide valid data/information to planners and administrators.

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