INDUSTRY-INSTITUTE INTERACTION EXPERIENCES AT TTTI, CHANDIGARH

DR. S. K. BHATTACHARYA *
DR. M. ADITHAN *
B. S. RATHORE *

ABSTRACT

Industry Institute Interaction has extensively been discussed on many platforms in the recent past. Many useful recommendations and suggestions have come up during the deliberations. Certain institutions have achieved success in this regard whereas many institutions are yet to reap the benefits of Industry-Institute Interaction. This paper highlights the experiences the Technical Teachers Training Institute (TTTI) Chandigarh in designing curricula for new programmes, revising and improving the existing programmes, in organizing training programmes in industry, in preparation of instructional materials, and in training of teachers, with active involvement of industry. Interactions with industry in these activities have been found to be mutually beneficial.

1. INTRODUCTION :

Technical Education in the states operates at three levels. Planning of new technical institutions, identification of new programmes to be offered in the existing and new istitutions are carried out at the Directorate level. Directorates of Technical Education (DTEs) also prepare and implement developmental plan for the state as a whole. Boards of Technical Education (BTEs) are responsible for design and development of curriculum in respect of new areas and updating of existing curriculum. They also carry out accreditation of the institutions in the state.

The implementation of the curriculum is carried out in the polytechnics. The institutions also carry out continuous evaluation of students performance and arrange training of students in industry.

At the classroom level the teachers plan and implement the instructional stategies and also monitor performance of the students.

An analysis of the present status has shown that there is considerable scope for enhancing interaction with industries for improving the quality and relevance of the programmes and activities at all these levels.

TTTI, Chandigarh, since its inception has visualised its role of interaction with industry and has achieved a great deal of success. The institute and the faculty helped the DTEs, BTEs, Polytechnics, Teachers and Students in deriving benefits of Industry-Institute Interaction. The experience highlighted in this paper would provide, at a glance, the possible areas of interaction with industry by any technical education system.

2. MANAGEMENT OF TECHNICAL INSTITUTIONS AT THE STATE LEVEL

For identifying new institutions to

* Professors & HOD's, TTTI Chandigarh.

be started and programmes that may be offered catering to the manpower requirements of the state, manpower Surveys and Feasibility studies were undertaken jointly by TTTIs and State Directorates of Technical Education. In this process, information for future requirements of manpower in the state were obtained from industries and other organisations with the help of the technical teachers drawn from various institutions. Necessary orientation and training were offered to these teachers in systematic analysis of the data and in making decisions about introduction of new courses and opening of institutions. TTTI involved the states and the teachers with the idea of helping them carry out this kind of activity on a regular basis.

Detailed project proposals were prepared for Quality Improvement and Capacity Expansion of Technician Education in tune with the current and future requirements in respective states for getting assistance from the World Bank. Industry-Institute Interaction for Quality Improvement of technician manpower is a major sub-component of these proposals. Holistic approach was adopted in formulation of proposals for overall improvement of technician education system.

There was a need to strengthen and restructure the DTEs and BTEs to bring in more professionalism and technical experties in respect of the different activities carried out by them. Studies were undertaken on restructuring of DTEs and BTEs on the basis of different functional requirements such as Planning and Management, Curriculum Design and Development, Industry-Institute Interaction, Faculty Development, Examination, Evaluation and Certification. Based on such recommendations, the DTEs and BTEs have been strengthened and professional wings have been provided for different functional areas. Training programmes, with the active involvement of the industries, were organised for the persons deployed in these new structures to carry out their activities effectively.

TTTI, Chandigarh, DTEs and some polytechnics signed Memorandum of Understanding (MoUs) to facilitate and coordinate Industry Institute Interaction at the state level and at the institution level. Action Plans were prepared to undertake follow-up of these MoUs.

As a result of these MoUs, industries have provided certain physical facilities to the polytechnics and extended training facility to faculty and students. Technical institutes in return have conducted continuing Education Programmes for industries.

Realising the need that training of teachers alone is not sufficient for bringing a change in the quality of students trained at the polytechnics, a massive programme of revision of all existing curricula and updating and reviewing of existing curricula were undertaken. The activities involved :

(i) Collecting feedback from the employers regarding the quality of technicians to be trained in polytechnics to help decide the knowledge, skill and attitudinal requirements to be included in the curriculum,

(ii) analysis of the information collected and systematically arriving at the learning experiences to be included, and

(iii) identifying list of equipment and additional laboratories and other facilities required.

In all these activities, industrial experts and technical teachers worked as a team and deliberated in workshops organised for the purpose.

Design of curriculum in respect of new courses were carried out with the active participation of representative industries. In the specialised areas such as Plastic

Technology, Ceramic Engineering, Die and Tool Making, Printing Technology, Instrumentation and Control, Microprocessors, Mechatronics, Production Engineering, Computer Applications and Industrial Electronics and other industries participated in an intensive manner for design of such courses. Curriculum, for non-engineering areas like Medical Laboratory Technology, Pharmacy, Beauty Culture, Textile Design, Architectural Assistantship, Office Management, etc. were also developed with the active involvement of employer organisations. In many of the curricula designed and revised, emphasis was laid on industrial training of students. Specific time slots have been provided in these curricula for this purpose.

3. STAFF DEVELOPMENT

Introducing of new courses and revisions of curricula necessitated training of teachers in new technological areas. In addition, need was felt to make the courses offered in the polytechnics "industry oriented and practice based." TTTI in collaboration with the DTEs, BTEs and polytechnics undertook the responsibility of providing staff development and training programmes for the technical teachers in subject matter updating, Industrial training, Management of Technical institutions, Students evaluation etc. Such training programmes were designed, developed and implemented in close association with industries.

Some of the courses were industry based having major inputs from industry followed by observations of processes and practices in actual locations. Groups of industries were identified where polytechnic teachers could take intensive training on specific assignments.

4. DEVELOPMENT OF INSTRUCTIONAL MATERIAL

To respond to the needs of teachers as also the student in terms of teaching learning material, a variety of print and non-print instructional material in the form of text books, laboratory and workshop manuals, data books, teachers guides, monographs, CAI packages, modules, charts, education video films, training boards, demonstration kits etc. were prepared. In developing all these instructional materials, experts from industries were involved either during preparation or in validation. The instructional material developed by this institute has satisfied the requirements of newly designed and revised curricula which are process and practices oriented. Educational films have also been prepared to bring into the classrooms, industrial processes and practices. Educational films on specific topics were also prepared for use by technical institutes. Certain industries acquired these films for use in their in house training programmes.

5. CURRICULUM IMPLEMENTATION

For effective implementation of curriculum, the following activities were undertaken by the polytechnic teachers:

(i) identification of certain content areas in which industrial experts could be invited,
(ii) identification of industries for student training and placement, and
(iii) identification of industry oriented project work.

Studies on various models of industry-institute interaction involving teachers and students from the polytechnics were also undertaken. The models developed were tried out in selected polytechnics and teachers were trained to carry out this work on a continuous basis. A Hand-book in Industry-Institute Interaction which provides guidelines to be followed in planning and implementing training of students and teachers in industries matching their profile with the assigned industrial problems and schemes of evalua-

tion of industrial training of students were developed. The Hand-book also provides guidelines on field visits and organisation of extension lectures. Confederation of Indian Industries of (CII) have made a contribution in this handbook on expectations of industry from polytechnic students.

Evaluation of students and their certification involving industries is an important area in which polytechnics and Boards of Technical Education are taking action. Certain polytechnics are now involving industrial experts in student evaluation in practical work and vice-voce examinations. There is still a considerable scope to involve experts from industries in assessing the competencies developed by the students.

6. CONTINUING EDUCATION PROGRAMMES FOR WORKING PROFESSIONAL

To help industries develop their technical staff, educational institutes need to offer continuing education programmes for working professional on the basis of their training needs. Total Quality Management, Statistical Quality Control, Implementation of ISO-9000, Exports Business Entry and Documentation, Computer based Financial Management, Energy Management, Industrial Electronics, Net working and Computer based Project Planning and Management, Industrial Electronics and Control. CAD/CAM Concrete Mix Design, Computers in Office Management etc. are some of the areas identified and courses were offered. To help polytechnic faculty organise similar programmes at their Institutes. TTTI invited teachers to attend these courses, observe the details and gain confidence. The feedback have shown that such continuing education programme were highly beneficial to the industries. The faculty also derived job satisfaction by offering these programmes.

7. ENTREPRENEURSHIP DEVELOPMENT, GUIDANCE AND COUNSELLING

Demonstration, Entrepreneurship Development Programmes for polytechnic teachers were organised to train diploma holders and science and technology graduates as entrapreneurs. In organising such programmes, practicing entrapr- eneurs, working professional from industry, experts from industries department, financial institutions, banks and other technical institutions were involved. The potential entrepreneurs were helped in identifying opportunities and preparing detailed project report. Escort services were provided for sanction of loans.

In some polytechnics "nodal centres" were established for promotion of entrepreneurship among the students. These centres have started organising entrepreneurship awareness camps, venture oriented project work, entrepreneurial circle activities, etc. for promotion of entrepreneurship among their students.

"Career Opportunity Fairs" were organised where representatives of industries and teachers from technical institutions and final year engineering degree and diploma students participated. In these fairs, career councelling was organised for students by involving employer's representatives. During interaction sessions, students were made aware of expectations of industries in terms of capabilities of the students. Students also came to know the opportunities of employment and career prospects available in various organisations. Participation in such fairs enabled the teachers to organise campus interviews and provides career guidance and councelling to the students.

8. CONSULTANCY SERVICES TO INDUSTRY

Institute faculty and post-graduate students (sponsored teachers and indus-

try professionals) undertook industrial problem-solving projects which helped industries of the neighbourhood. Attempts were made to get all the thesis work of P.G. studenbts sponsored by industry.

Training needs of industry were also identified for organising in-house training programmes. Need based industrial consultancy was provided to industry by the individual faculty. Internal resource generated through consultancy services helped the institute modernise its laboratories and create some additional facilities for faculty.

9. PROBLEMS AND ISSUES

While organising various programmes and activities at various levels by having constant interaction with employer organisations, as mentioned above, certain problems and issues emerged which require urgent action from all concerned. These problems and issues are listed as follows. These need deliberations for arriving at possible suggestions and recommendations :

(1) mechanism/ structure to be established to promote industry institute partnership for :

(a) identification, review and design of curricula of engineering/technology programmes;

(b) undertaking joint research and developmental activities;

(c) professional development of work-force in industry;

(2) strategies/mechanism to be adopted for promoting flow of information regarding requirement of technical manpower and their capabilities in the areas of emerging technologies;

(3) restructuring various programmes of technical institutions in today's context;

(4) mechanisms/strategies for resource sharing between industry and technical institutions;

(5) strategies to be adopted for enhancing relevance of curriculum, industrial training of students and teachers;

(6) initiatives to be taken for bringing a cultural change to develop partnership between technical institutions and industry;

(7) changes to be made in the instructional process for developing requisite capabilities in engineering diploma and degree students;

(8) kind of autonomy to be provided to the technical institutions.

10. CONCLUSION

During the various programmes and activities undertaken in promoting industry-institute interaction, TTTI Chandigarh had very encouraging, meaningful and pleasant experiences. The programmes organised at the Institute in collaboration with industry have been found to be qualitatively better and more effective. In all the activities undertaken, the institute had derived immense benefits and received maximum co-operation from the industries, Polytechnic faculty involved in industry oriented projects and programmes were able to understand the process of industry-institute interaction better. These helped them to translate these experiences in their own polytechnic environrment for qualitative improvements. Continuing Education programmes conducted by the institutes, helped industry in updating the knowledge of their technical work-force. Instructional materials developed by technical institutions also were of use to industry. Designing and implementing industry oriented and practice based curriculum in technical institutes hopefully would provide better technical manpower to industry in years to come. To further promote industry institute interaction, the problems and issues highlighted in this paper need to be discussed at the state level.

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