

## **The Role and Impact of Teaching Curricula in Meeting National Needs: A case Study of IITs**

### **EXECUTIVE SUMMARY**

The five Indian Institutes of Technology (IITs) have been established as institutions of national importance and are governed by an Act of Parliament. They are funded directly by the Ministry of Human Resource Development. The five institutes were reviewed by the IIT Review Committee which brought out its report in 1986. The present report is the final report of a DST sponsored project to study the role and impact of teaching curricula of the IITs on the national scene.

As inputs to this study, a number of questionnaire surveys were conducted covering the alumni of the IITs, the industry and other employing agencies, and the faculty of the IITs. In addition, two panel discussions were organized on the subject, two meetings of the Project Advisory Committee were held, and a number of eminent persons were interviewed. A number of reports related to the subject were also studied.

While views on what constitutes national needs (as far as engineering education is concerned) vary from person to person, it was found that certain amount of commonality emerges. The Review Committee Report also lays down certain expectations from the IITs vis-a-vis national needs. It is generally agreed that top class institutions like the IITs can and should frame their curriculum to suit the national needs and that this is not inconsistent with having a world class curriculum.

The curricula of the IITs have been studied in details as also the periodic revision in the curricula and the methodology used in redesigning the curriculum. The curricula of some of the other well known engineering institutions of India have also been studied as also the model curricula prepared on behalf of the ministry of the Human Resource Development. The international scene have been surveyed. It is found that there are common problems which are forcing all nations to have a critical look at the engineering curricula and to revise it to meet the emerging needs. Some of the needs are specific to the country or the region concerned. In the case of India, there are very specific reasons why the engineering curricula need an overhaul. This is related as much to the rapidly changing technology as to the new economic policies and the changing industrial scenario.

The impact of the IITs on the national scene has been looked at from

two perspectives - the impact on technical education and the overall S and T scenario. It is found that the IITs have very significantly contributed to the growth and development of technical education in the country. This is largely under a number of programmes started by Ministry of Human Resource Development as a follow up of the National Policy on Education. The overall impact of the IITs on the industries and research and development work had also been good. In particular, areas such as space, defence, electronic, computers, etc., have gained appreciably from inputs from the IIT faculty as well from the work of IIT graduates. The IITs have created a feeling of national pride and have demonstrated the country's ability to set up and run world class technical institutions.

There are certain areas of concern where the achievements have not been as expected and other areas where the overall impact is adverse. The chief area of concern is the lack of interaction of the IIT faculty with the Indian industrial environment. Curriculum related items such as summer training and industrial tours have not been organized well and have not been very effective. The IITs have failed to convey to the students a feel for India's industry and the challenging problems. The students tend to feel alienated from the mainstream of Indian life and work. IITs have been unable to cultivate a sense of national pride, and a commitment to the nation in its students.

The main recommendations arising out of this study are:

1. The components of the undergraduate programme which contribute to the student's awareness of the Indian industrial scene, namely, summer training and industrial tours, should be organized with much greater care and effort. Persons from the industry should be invited to give lectures in the courses as well as give extra-mural lectures.
2. The IIT faculty should consciously improve their involvement in the industrial scene. This can be done at several levels. There is need to modify some of the reward and incentive systems so that faculty will feel better rewarded for industrial interaction. Recruitment should also take this into account.
3. There is a need to develop contact with the alumni on a much larger scale than what exists at present. This will contribute to the financial resource position and also lead to greater industrial interaction.

4. There is a need to increase the availability of Indian authored text and reference books for every subject and this should be taken up as a mission with proper planning, incentives and financial gains. This will go a long way in generating confidence in the students in the caliber of the faculty and also provide an 'Indian perspective' to the teaching of engineering.
5. The student evaluation of course and teachers is well recognized factor which all well known universities in the world use for improving their education standards as well for reward/punishment of the faculty. This system has not evolved properly in the IITs although some form of student evaluation is done in many of the IITs in many departments. There is need to develop a well thought out system in this regard.