

THE DEVELOPMENT OF ENGINEERING AND TECHNICAL EDUCATION IN INDIA

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ABSTRACT

Technical Education system is dynamic in nature. It faces many hurdles in response to societal, technological and economic changes in the environment both home and foreign. The debate today is not only about the value and role of Technical education in the social and economic development of a nation but has a broader aspect. Technical education is widely recognized as a vital part of the total education and training system. The real challenge is how to reposition it by shifting towards a developmental paradigm that holds sustainability as its core. It is hoped that this paper will provide a definite idea on technical education and its importance and some useful insights on the underlying meaning, policies and choices which may help to shape the systems of technical education and training further.

Keywords: *Technical education, ISTE, DOTE, AICTE*

I. INTRODUCTION

Technical education is imparted at three different levels in India.

- i) Industrial training institutes (ITI), which runs trade courses for skilled workers.
- ii) Polytechnics, they run diplomas to produce middle level (supervisory level) technicians.
- iii) Engineering colleges, which conduct under graduate programme.

In the circumstances, technical education is essential to run our factories and fields of production. That is also financially advisable. There are a few households in an Indian city that do not nowadays depend upon machinery, directly or indirectly. Manual labour is being superseded by steam, gas and electrical power.

The mighty forces of Nature are being harnessed to serve the wants of man. We are dressed by machinery, transported by machinery, lighted by machinery, our very catering and amusements are being ministered to by the mechanical contrivances of radios, televisions and cinemas and internet arrangements.

Every home has to depend on electricity; every office is equipped with telephones and teleprinters, and computing machines of all kinds. Even the playgrounds have electrical scoreboards and timekeepers. And this mechanization of life will increase and expand as days would roll on. Hence we have to be mechanics and technicians to manage these, and must build up heavy industries to manufacture these. The need for industrial or technical education in our country is no longer a subject of debate.

II. CHALLENGES AND OPPORTUNITIES FOR HIGHER EDUCATION

- ✓ The challenge to universities, corporations to recognize the opportunities & seek to develop them globally.
- ✓ The challenges to government to encourage their higher education institutes to set up international alliance.
- ✓ The opportunity to establish worldwide common interest network lies within our immediate grasp.
- ✓ The delivery of courses globally offers a great opportunity for those developing and underdeveloped countries who seek for higher education.
- ✓ The major challenge is quality of course. Courses should be worldwide accepted.
- ✓ Low standard courses which are run solely for profit over the web must be avoided at all costs.
- ✓ Widening gap between haves & have nots.

The challenges in engineering education are

- 1) Engineering institutes (mainly private) are becoming profit-making bodies. Technical education is perceived as business opportunity.
- 2) Diverting youth to technical education. The seats in engineering institutes & polytechnics are remaining vacant. This situation is worst in rural area. Engineering education has become expensive.
- 3) Severe shortage of qualified & competent faculty especially in IT field.
- 4) Due to IT revolution, there is increase in capacity of IT related branches & hence other disciplines are being suffered.
- 5) Lack of interest among graduating engineers to pursue teaching career.
- 6) In present scenario, quality of education need to be addressed urgently.
- 7) Competitions from foreign universities.
- 8) Tendency of research scholars to prefer computer based research over experiment research.
- 9) Quality of software and its security problem.
- 10) Promotion of Industry-Institute Interaction.

Engineering education is lacking in following areas.

- 1) Oral & written communication skill.
- 2) Inter disciplinary knowledge.
- 3) Practical & commercial orientation.
- 4) Creativity & innovation.
- 5) Learning to learn.
- 6) Interpersonal skill.
- 7) Introspective nature.

III. TECHNICAL EDUCATION – ISSUES AND CONCERNS

“Technical education”, in the sense in which the term is ordinarily used, and in which I am now employing it, means that sort of education which is specially adapted to the needs of men whose business in life it is to pursue

some kind of handicraft. Technical education, aims primarily at equipping a man for work in the practical sense of getting him fit for a job. Technical education, that is, education in some art or craft is the crying need of the hour. We are living in the times when old concepts of education have undergone a change. We are not in need of liberal education, education that implies training in the fine arts, the humanities, cultural patterns and behavior, and aims at developing a man's personality as it was in the pre-independence days. We need skilled workers. Manufactured goods worth crores of rupees are being imported every year. There is dearth of food. Our industries are yet in infancy. We need engineers to man them. We need mechanized farming to increase the output of corn. All this is only possible if we give a technical turn to our education and if skilled labour is made available. At present there are very few good technical institutions in the country. And the reason is not far to seek. Most of our young men have a sort of prejudice against all types of manual labour. They prefer a job in some office to doing work with their hands. They think that manual labour is degrading. Unemployment, therefore, stares them in the face. The jobs of clerks in offices too, are limited. All educated young minds cannot be absorbed in this vocation. Technical education is only likely to succeed when a large part of the nation has become sufficiently literate. It is an excellent thing to train an electrician's son in the latest development of his trade, but it is ridiculous to expect him to become a first rate electrical engineer unless he has gone through a primary course in liberal education. It is, therefore, not wise to put liberal and technical educations in water-tight compartments. The proper policy would be to stress liberal education in the early stage, say till Matriculation, and then commence with the main course of technical education basing on the student's choice of scientific research on aptitude and inclination. India is rich in mineral resources but most of them have not been tapped. The government is keen to utilize this wealth. More and more technical institutions are, therefore, being opened. A large number of technical hands are pouring out of our universities every year. It is a happy sign of the times but unfortunately our industries are still mediocre and the number of jobs is less. No nation could generate the progress unless it promotes technical aspects in its fields. The technical education produces technicians for all type of industries and it is true that the progress of a country much depend upon its Industrialization without which a handsome economy would not be possible. Technical education also makes a man narrow and materialistic in outlook and makes him unfit for the true appreciation of art, music and literature. A highly specialized worker in the branch of industry is of no use in another. It is necessary for perfect life that man should learn to earn his living and to learn the art of living at the same time. While stressing the importance of technical education, we must always keep in mind that the best education, the education that goes most towards developing decency and culture, is still liberal. Technical education must always be aware of the higher end; and so long as it keeps it in view, it is bound to be of immense help in the building of our country's future.

IV. LOOKING AHEAD – REFORMS NEEDED, OPPORTUNITIES AND THREATS

4.1 Academic – Industry Interaction

Globalized competitiveness have called for a close interaction and collaboration of knowledge institutions with industry, entrepreneurs, society and market. Indeed, the interaction has become essential for the survival and growth of both the academic and industry in a highly competitive world. There is thus a strong need to promote interaction between the institution and industry.

4.2 Heeding Innovation

The technical students have succeeded in creating a culture of innovation but often those innovations are not brought to proper attention. The need is to take such innovations to market. This requires creating necessary mechanisms and structures including partnership with venture companies to shape the laboratory level innovations to the industry accepted designs and innovative products.

4.3 ROLE OF PROFESSIONAL SOCIETIES

The professional societies help in nurturing a student's mind and abilities. These societies recognize academic as well as professional achievements of individuals by electing them as Members or Fellows, hold seminars and workshops in selected emerging areas and publish status reports, enhance engineering temper and industry-academic interaction through a variety of programmes.

4.4 CURRICULUM REFORMS

Provisions like the credit transfer facility should be provided for students to complete a course of study in more than one University, facilitate movement from one department to another as per the interest and capabilities of students, encouraging and offering research ecologies and tours to attract and retain some of the best talents of the rest of the world. Foreign Universities should be allowed entry into India to diversify the education system and to create more opportunities.

4.5 PROMOTION OF DISTANCE EDUCATION

Today lacs of students sit for different Higher Education Exams but only few thousands qualify to enter the Universities since the annual intake capacity of Universities is restricted. This is a major problem in the system, and this question has to be immediately addressed. Hence the rest of the students must be given an opportunity to make use of the Distance Education. The expansion of the Open University and the effective use of external degrees formula. It is through enrollment in non-university institutions that the problems relating to access could be solved.

VI. SUSTAINABLE INDUSTRIAL GROWTH AND SOCIAL UPLIFTMENT

Technical education promotes the material prosperity and economic advancement. It produces the sense of self-respect and dignity. If a country has her own technical experts, she may save a lot of foreign exchange i.e. Technical Education makes a country rich, prosperous and resourceful. Our country is rich in raw material resources but the thing is we must have enough technical information to benefit from them. Technical education contributes substantially to the Socio Economic development of the country as a whole. The development sustenance of the industrial sector is entirely dependent upon the availability of trained manpower to perform the multidimensional activities needed to keep the wheel of industry running. Technical Education aims towards making available these trained technically qualified hands to serve the industry and society. Technical Education plays a vital role in human resource development of the country by creating skilled manpower, enhancing industrial productivity and improving the quality of life.

VII. CONCLUSION

Finally, the point has to be made that technical and vocational education and training alone by itself does not lead to rapid industrialization, or provision of jobs or eradication of poverty. Good government policies do all three. The rapid expansion of technical education in the post-liberalization era has thrown open new challenges

including implementing major reforms, feeding the demands for new jobs and further training so that opportunities are created on a sustainable basis to trace and light the path for industrialization and social development.

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