HISTORY OF TECHNICAL EDUCATION

2.1 REVIEW OF DEVELOPMENT OF TECHNICAL EDUCATION:

If one examines the historical perspective of technical education, it would be said that the foundation of technical education in India was laid almost at the same time as in the Europe but its growth had been very restrictive and slow. For acquiring intimate knowledge of the country’s topography through physical survey of India, the English traders established a survey school in Madras in 1794 [36]. As early as 1824, an engineering class was organised by Bombay Native Education Society and instructions were imparted in mother tongue. In 1844, another engineering class was started in Elphinstone Institutions. In 1854, yet another engineering class and mechanical school was opened at Poona for training subordinate officers of Public Works Department.

Prior to 1857, attempt of vocationalisation was made in the field of medicine, civil engineering and Law. The specific attempts then were motivated by a desire to train subordinate officers for public administration. Like other categories of education, engineering education also thrived during the period under review because there were considerable opportunities of employment in Public Works Department, Local Boards, Municipalities and Railway companies.

The outcome of “Woods dispatch 1854” [18] was the establishment of the engineering colleges to meet the growing need of
locally-trained personnel. In 1847 the first engineering college was established at Roorkee.

Hunter's Commission (1880-82) made a comprehensive study of the situation and recommended effective measures to improve the situation. In 1887, Victoria Jubilee Technical Institute at Bombay was established to train licenciates in electrical, mechanical and textile engineering and technology. The Indian Industrial Commission said critically that the system of education introduced by Government was mainly intended to provide for administrative needs of the country and encouraged literacy and philosophical studies. Lord Curzen in 1901 had recognised and introduced the system of technical scholarship tenable for study in England. During 1901-1902, there was no provision in India for technological training. The Government of India had, therefore, to choose between two alternatives - either to develop technological institutions in India or to send Indian students abroad to receive technological training. It chose the later alternative because it was then believed that technological institutions would not succeed in India. The Government, therefore, decided to give ten scholarships annually to enable Indian students to obtain technological training in United Kingdom. Nevertheless, the Indian opinion keenly advocated the establishment of technological institutions in India.

In 1908, College of Engineering at Jadavpur in Bengal was established. Jamsehdji Tata established in 1909 Indian Institute of Science at Bangalore. In 1913, the then Government of Bombay constituted a committee to give direction to technical education which worked in close cooperation with Victoria Jubilee Technical Institute (VJTI). Pandit Madan Mohan Malviya- the founder of Banaras Hindu University started comprehensive engineering course in 1917. Pandit Madan Mohan Malviya in his supplementary note attached to Industrial Commission's report, said that he would like to utilise the existing schools, as far as possible not only for imparting progressive courses but

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also for offering the course in Elementary Physics, Chemistry, Carpentry, and Smithy.

2.2 SIR VISVESVARAYA COMMITTEE:

A conference of Principals of engineering colleges held in July 1921 recommended that opportunities for study of engineering in all its branches up to as high the standards as taught elsewhere should be provided in existing engineering colleges in India. In order to widen the scope of technical education a committee under the chairmanship of Sir M. Visvesvaraya was appointed in 1921 and as a result of these recommendation the Government created a Joint Directorate of Technical Education.

In the nineteen twenties and thirties, largest employment opportunities offered in Textile and allied industries and also in civil engineering. Most of these institutes were not affiliated to any university but mostly managed by the departments of industry.

In 1936-37, two expert advisors, Messes Abbot and Wood were invited to advise the Government on certain problems of educational re-organisation and particularly on problems of Vocational and technical education. The report recommended major reforms in education system by suggesting a complete hierarchy of vocational and technical institutes parallel to that of the institutes imparting general education.

2.3 LORD LYTTAN COMMITTEE REPORT (1921-22):

The question, therefore, was referred to a special committee presided over by Lord Lyttan (1921-22). Most important recommendation was that the ultimate solution of the problem lies in the development of the highest technological institutes in India.

(1) In the period of 1854-1902, there were no technological institution in India, nor did Indians go abroad in large numbers for technical studies.

(2) During the period of 1921 to 1937, therefore the efforts of Government
and of the public were mainly directed to organising the highest type of technological institutions in India itself.

2.4 VICTORIA JUBILEE TECHNICAL INSTITUTE :

The Government Apprentice Scheme was introduced in 1937 by opening one centre at the Victoria jubilee Technical Institute, (VJTI) Bombay, with the aim to accept young men for apprenticeship in engineering, weaving, spinning and dying in textile. The object of the scheme was to develop skilled workers having benefit of practical training in Industrial workshops and in textile mills. In addition, theoretical instructions in the evening classes were arranged at the VJTI.

The Government Engineering School, Nagpur during 1937, which was the only school of its type in this Central India having students in Civil, Mechanical and in Automobile Engineering. Civil Engineering students generally employed in Public Works Department and Mechanical and Automobile engineering students in private mills and factories.

The most prominent of these technical institutions was Victoria Jubilee Technical Institute, (VJTI) Bombay. This school has sanitary, mechanical, electrical, chemical and textile branches. The courses extend over a period of four years including six months of practical training in workshops. The students have no difficulty in getting access to factories and shops. The school was not affiliated to the Bombay University, but its diploma was equivalent to B.Sc. degree.

The technical and industrial education in India was generally neglected till the end of the nineteenth century. By the beginning of this century however, the question began to receive prominent attention in official circles.

2.5 SIR ARDESHIER'S IMPRESSIONS (1944) : [18]

In 1944, Sir Ardesher felt that traditional life of India need to be changed, the services of qualified scientists, technologists and
technician would be urgently required to be utilised to the large extent by giving technical education and emphasised the need to create training and educational facilities like institutions abroad. He also impressed the industrialists, the need for promoting research and science institutions. The following steps were taken to promote development of scientific research and technical education.

- Establishment of a Department of Scientific and Industrial Research (New Council of Scientific and Industrial Research).
- Appointment of a committee under the Chairmanship of Mr. N.R. Sarkar for development of higher technical education.
- Establishment of a fellowship scheme for training of scientific and technologists abroad.
- Co-ordinational development of technical education on a national basis, two national advisory organisations as under were established.
  (a) All India Council for Technical Education (AICTE)
  (b) An Advisory Committee on Technical Training Scheme.

Sarkar Committee recommended the establishment of four regional higher technical institutions to promote and develop the essential requirements to economic development, in terms of technical manpower.

Since 1947, realising the importance of technical education in developing key human resources for economic growth, and to meet the great challenge of developing the country's national resources, effective steps were taken to build up a sound infra-structure for developing a technical education system to meet the growing needs of the country.

2.6 Dr. BHATNAGAR COMMITTEE (1947) : [11]

In 1947, a Scientific Manpower Committee under the Chairmanship of Dr. Shanti Swarup Bhatnagar [11] was appointed to study the problem in depth and to recommend suitable measures to meet the future challenges. The Committee assessed the requirement for
scientific and technical personnel for the period of 10 years from 1947 to 1957 to meet the growing demands in various fields.

2.7 SIR RADHA KRISHNA COMMISSION : [1948-49] [18]

The commission (The University Education Commission 1948 - 49), while considering the problems of higher education made a critical study of the engineering and technological education in the country vis-a-vis the global situation and made recommendations to improve the technical education system in the country.

(1) Establishment of western institution which should be in or near Bombay, should be taken in hand concurrently in the western region or failing that as soon as possible.

(2) Indian Industrial Commission criticised the present tendency in education in India and the need of technical education is universally recognised.

Pandit Madan Mohan Malviya has given his views on the Industrial Commission’s report. In general, the plan of vocational education is designed with a view to ensure adaptability to Indian conditions. He also said that the technical education facilities during that era were very limited.

The history of development of engineering and technological education in the Western India is closely linked up with a modern education in the State of Bombay. Until 1937, College of Engineering, Poona was the only institution in Western India imparting instructions in engineering at degree level.

The past four decades have been marked by phenomenal expansion of technical education facilities. Several institutes of excellence have been established in Maharashtra. Engineering man power committee appointed in 1955-56 had also highlighted the requirement of manpower. In 1957, an informal group on manpower was established with the representatives of Planning Commission, Labour scientific, research

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and cultural affairs, commerce and industries.

2.8 DIRECTORATE OF TECHNICAL EDUCATION:
Since 1948, a separate Directorate of Technical Education in Maharashtra was established to supervise all institutions imparting engineering, technical and industrial education at different levels. The head of this branch is designated as "Director of Technical Education", whose functions were to advise the Government and to make recommendations on the course content, standards, examination pattern and other academic matters.

The Training organisation of Government of India, Ministry of Labour, Directorate General of Resettlement and Employment, New Delhi, was transferred to the State Government with effect from 1st November, 1956, and placed under the charge of Directorate of Technical Education.

Kothari Commission (1968) recommended the following steps to build an effective administration of technical education.

(a) Recommended setting up of University Grant Commission (UGC) type organisation on which adequate representation should be provided to the UGC, professional organisations, and industry. This body should have a full time chairman and funds should be allotted to it on a block basis.

(b) Such an organisation should work in fullest collaboration with competent organisations such as Planning Commission and Institute of Applied Manpower Research, (IAMR) for getting manpower projections, regarding requirements of engineers and research works etc.

(c) The technical institutes should be given full university status (academic freedom).

(d) Recommended that all states should set up Directorate of Technical
Education to co-ordinate programmes and ensure continuing contact with manpower and planning mechanism.

(e) The Chairman of Board of Governors of Regional Engineering Colleges should be drawn from a panel of distinguished educationist.

(f) The Principals of Colleges should have full discretion to decide matters relating to the building up of educational facilities in their institutions and should have full disciplinary powers vested in him in respect of the appointment of staff.

(g) Human Resource Development through education is more crucial than actually development of physical resources. The realisation of the country’s aspirations involve changes in the knowledge, skills, interest and values of the people as a whole.

(h) The main task before the nation is to secure rapid economic development. If this is to be successfully accomplished, education must be related to productivity. The present system is too academic to be of material help in increasing national wealth.

2.10 CATEGORIES OF TECHNICAL INSTITUTIONS:

Engineering education today faces more challenges than education in any other discipline. The educational institutions remain stratified into six categories.

(1) Indian Institutes of technology (IIT)
(2) State Universities of Technology and University Departments of Engineering / Technology
(3) Regional Engineering Colleges (REC)
(4) Government Colleges
(5) Aided private colleges
(6) Unaided Private Colleges

These institutions are different in
• management system
• level of funding
• academic autonomy
• administrative autonomy
• financial autonomy
• content of courses
• quality of instruction
• level of research and interaction with industry
• extension programmes
• growth and degree of experience

In Maharashtra, private enterprises have played a positive role and contribution to education. In modern India, private enterprise has played an important role in development of education and technical education in particular. [44]

2.10 THE NATIONAL POLICY ON EDUCATION - (NPE)- 1986 :

For the first time, the NPE-1986 brought technical and management education together, in view of their close relationship and complementary concerns. It laid emphasis on the following areas :-
• Reorganisation of technical and management education.
• Greater induction of improved technologies into the infrastructure and service sectors as well as the unorganized rural sector.
• Strengthening of the Technical Manpower Information System.
• Promotion of continuing education
• Organisation of computer literacy programmes at the school stage.
• Reorganisation of technical and management education programmes on a flexible modular pattern based on credits, and with provision for multi-point entry.
• Appropriate formal and non-formal programmes of technical education for the benefit of women, the economically and socially weaker sections and the physically handicapped
• Training in entrepreneurship for self-employment.
• Focusing on research for development for improving present technologies,
developing new indigenous ones and enhancing production and productivity.

- Setting up suitable systems for technology watch and technology forecasting.
- Networking relationships between institutions at various levels and with the user systems.
- Initiation of steps for promoting efficiency and effectiveness at all levels and for achieving cost effectiveness and excellence.
- Coordination by the Ministry of Human Resource Development (MHRD) of the balanced development of engineering, vocational and management education as well as the education of technicians and craftsmen.
- Granting of statutory authority to the AICTE for planning, formulation and the maintenance of norms and standards accreditation funding of priority areas, monitoring and evaluation etc.
- Maintenance of standards by curbing the commercialisation of technical and professional education.

2.11 THE ALL INDIA COUNCIL FOR TECHNICAL EDUCATION ACT (AICTE ACT 1987-88):

Recently in 1988, the All India Council for Technical Education has been vested with statutory authority for planning, formulation and the maintenance of norms and standards, funding to priority areas, monitoring and evaluation for ensuring the co-ordinated and integrated development of technical and management education.

The AICTE Act defined "Technical Education" to include programmes of education, research and training in engineering, technology, architecture, town planning, management, pharmacy, applied arts and crafts.

The major powers and functions of the Council were listed to include; as per Statute/Rules

- Forecast of the needed growth and development in technical education.
• Co-ordinate the development of technical education in the country at all levels.
• Promote innovations and research and development in established and new technologies; generation, adaptation and adoption of new technologies to meet developmental requirements, and for overall improvement of educational process.
• Formulate schemes for promoting technical education for women, handicapped and weaker sections of the society.
• Promote an effective link between technical education system and other relevant systems including R and D organisations, industry and the community.
• Evolve suitable performance appraisal systems for technical institutions and universities imparting technical education, incorporating norms and mechanisms for enforcing accountability.
• Formulate schemes for the initial and in-service training of teachers and for setting up centres for staff development programmes.
• Lay down norms and standards for courses, curricula, physical and instructional facilities, staff pattern, staff qualifications, quality of instruction, assessment and examinations.
• Fix norms and guidelines for charging tuition and other fees.
• Grant approval for starting new technical institutions and for introduction of new courses or programmes in consultation with the agencies concerned.
• Lay down norms for granting autonomy to technical institutions.
• Advise the Central Government regarding professional societies in the matter of examinations and award of membership certificates.
• Take all necessary steps to prevent commercialisation of technical education.
• Provide guidelines for admission of students to technical institutions.
• Inspect or cause to inspect any technical institution.
• Withhold or discontinue grants in respect of courses and programmes to such technical institutions which fail to comply with the directions given
by the council within the stipulated periods of time.

- Declare technical institutions at various levels and types offering courses in technical education fit to receive grants.
- Create positions of professional, technical, and supporting staff based on requirements.
- Advise the UGC for declaring an institution imparting technical education as a deemed university.
- Set up a National Board of Accreditation periodically conduct evaluation of technical institutions or programmes on the basis of guidelines, norms and standards specified and to make recommendations regarding recognition or derecognition of the institution or programme.