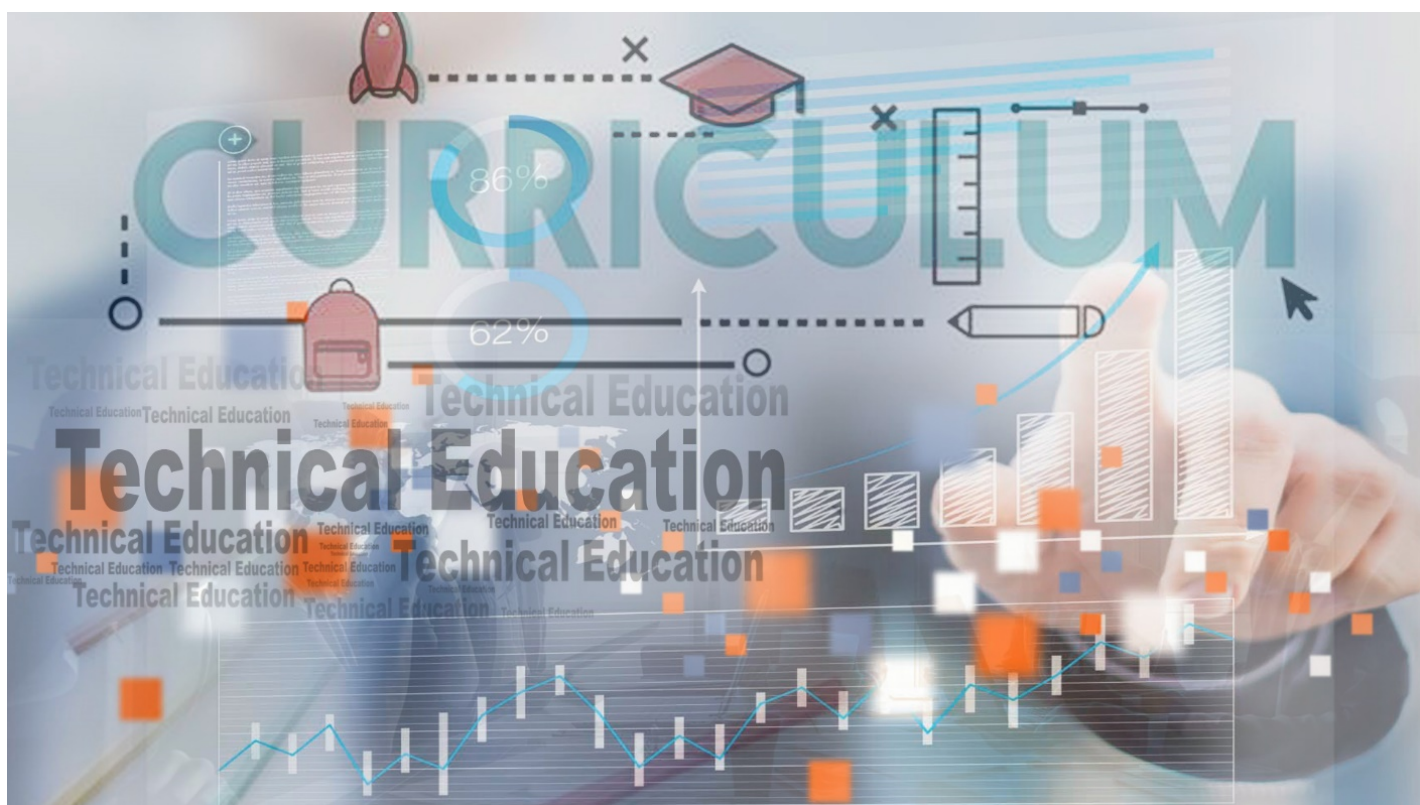


Module 1: Orientation Towards Technical Education and Curriculum Aspects

Unit 1: Orientation Towards Technical Education



L -1 STRUCTURE OF TECHNICAL EDUCATION

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UNIT – 1

ORIENTATION TOWARDS TECHNICAL EDUCATION

L1: Structure of Technical Education

LEARNING OBJECTIVES :

- 1.0 Explain the role of higher education in the society.
- 2.0 Describe the structure of Technical Education.
- 3.0 Recognize the different types of Technical Institutes.
- 4.0 Interpret the roles of National Agencies – MHRD, AICTE, UGC, NITTTR, DTE, ISTE.

1.0 ROLE OF TECHNICAL EDUCATION IN THE SOCIETY

Technical education contributes a major share to the overall education system and plays a vital role in the social and economic development of the nation. Today the advancements made in the field of science and engineering has made life sophisticated and moreover, has improved the quality of life. Hence the Technical education, which plays a vital role in human resource development of the country has the need

- to create skilled manpower
- to enhance industrial productivity and
- to further improve the quality of life.

The bridge from human resource development to economic growth must be built by well trained teachers. The most important ‘agent of change’ in ‘Knowledge Society’ is the teacher.

The twenty first century presents a radically different economy and society, which is likely to have profound implications on Technical Education and Training (TET). The Technical education system must adapt to the key features which include Globalization & Sustainability, ICT Revolution, Emergence of Knowledge Society Rapid Knowledge Obsolesces.

There is at least one generation gap between the Learners and the Teachers. ICT provides powerful tools to support the shift from teacher-centered to learner-centered paradigm and new roles of teacher, learner, curricula and new media.

A teacher requires many educational and didactical skills to deal with new situations. These are

- Knowing subject matter deeply
- Learning to learn Skills
- A large knowledge of digital educational tools.
- How to be a facilitator and motivator of learning environment.

Teachers must be curriculum leaders. Ensuring that teachers are central to the reformation of curriculum will enable the development of pedagogy that provides the most favorable condition of learning and the highest quality learning outcomes for all students.

The new role of teachers demands a new way of thinking and understanding of the new vision of the learning process. There is enough evidence in different fields of educational practice to understand that learning does not happen in the absence of teacher expertise in what to teach and how to teach it. Strong formal teaching and learning, aided by various educational technologies and premised on an up-to date understanding of the vocational, technical and professional field of practice is what is 'good enough' for Technical education.

This module delivers necessary foundations for shaping teacher education and refining the role of teachers and learners in the new, independent and engaging environment that has been created for them.

2.0 STRUCTURE OF TECHNICAL EDUCATION IN INDIA

India is witnessing the age of science and technology. There is a huge demand of Technical Education in modern age. Technical Education offers good opportunity for employment and successful career.

We all know that technical education system in our country has grown into a fairly large-sized system, offering opportunities for education and training in a wide variety of trades and

disciplines. In India, technical education is imparted at various levels such as craftsmanship, certificate, diploma, degrees at undergraduate, postgraduate and doctoral levels through institutions located throughout the country.

Technical Education covers programs in engineering, technology, management, architecture, town planning, pharmacy, applied arts and crafts, hotel management and catering technology.

The educational structure in India is generally referred to as the Ten + Two + Three (10+2+3) pattern. The first ten years provide undifferentiated general education for all students. The +2 stage, also known as the higher secondary or senior secondary, provides for differentiation into academic and vocational streams and marks the end of school education. In some states, the plus two stage is located in intermediate, junior or degree colleges but is not regarded as a part of the tertiary stage of education.

The technician educational program in Polytechnics has been shown to exist after the ten years of general education. The location of one year or two-year programs of the Industrial Training Institutes exist at VIII+ and X+ levels followed by the apprenticeship training.

Students completing higher secondary education enter professional courses like engineering, medicine, law, applied science and craft, architecture, agriculture, other technology courses like leather technology, chemical technology, fashion technology, etc., Some enter into art, literature and science streams. Students entering Engineering Institutions graduate as Engineers usually after four years of study. Some of them enroll into Post graduate studies for specialization followed by Research programs like Ph.D.

For acquiring technical education, there are two structural streams in India – formal and non-formal.

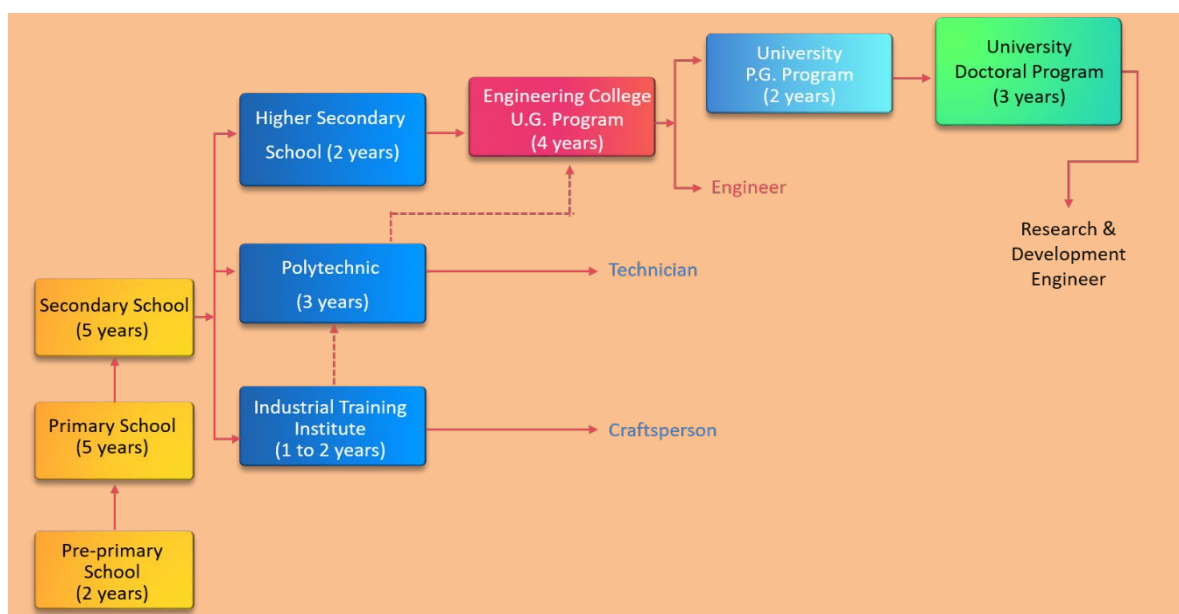


Figure 1: Structure of Technical Education system in India

Technical Institutes, Engineering Colleges, Polytechnics, Industrial training centers, Vocational Secondary Education are the formal sources of technical education in India. Self-learning and small private institutes providing short term technical course are covered under informal one. The non-formal systems operating at elementary stage, secondary stage (open school) and tertiary stage (open university) also exist.

3.0 TYPES OF TECHNICAL INSTITUTES

A. INDUSTRIAL TRAINING INSTITUTES (ITIs)

There are two notable training programs for primarily skilled workers for the organized industrial sector.

They are

- I. CRAFTSMEN TRAINING SCHEME
- II. APPRENTICESHIP TRAINING SCHEME

I. CRAFTSMEN TRAINING SCHEME

The Directorate General of Employment & Training (DGE&T) in the Ministry of Skill Development and Entrepreneurship, Government of India initiated Craftsmen Training

Scheme (CTS) in 1950 by establishing about 50 Industrial Training Institutes (ITIs) for imparting skills in various vocational trades to meet the skilled manpower requirements for technology and industrial growth of the country.

Several new private ITIs were established in 1980's in southern states mostly in Kerala, Karnataka and Andhra Pradesh, etc. from where trained craftsmen found placement mainly in Gulf countries.

According to the Ministry, there are 14312 Industrial Training Institutes (ITIs) functioning in the country. Out of them, 2204 are Government and 12108 are Private ITIs. All of them, however, are affiliated to the National Council of Vocational Training.

Under the constitution of India, Vocational training is the concurrent subject of both Central and State Governments. The development of training schemes at National level, evolution of policy, laying of training standards, norms, conducting of examinations, certification, etc. are the responsibilities of the Central Government, whereas the implementation of the training schemes largely rests with the State Governments /UT Administrators.

Let us see the Salient Features of the Scheme

- Training is imparted in 70 engineering and 63 non-engineering trades.
- ITIs are functioning under the administrative control of the respective State Govts. /UTs / Private Organizations.
- The period of training for various trades varies from six months to two years and the entry qualification varies from 8th to 12th class pass, depending on the requirements of training in different trades.
- The institutes are required to conduct training courses as per the curriculum prescribed by National Council for Vocational Training (NCVT). The admission to the new courses are made in the month of August every year.
- The trainees after completion of the training period are required to appear in the All India Trade Test conducted under the aegis of National Council for Vocational Training. The successful trainees are awarded National Trade Certificate which has been recognized by Govt. of India for the purpose of recruitment to subordinate posts and services under the Central Govt.

- About 70% of the training period is allotted to practical training and the rest to theoretical training relating to Trade theory, Workshop Calculation & Science, Engineering Drawing, Social Studies including environmental science & family welfare.
- Training in Govt. ITIs is provided at nominal fee. They are also provided with library, sports and medical facilities etc.
- Syllabi of various trades are periodically revised to keep pace in tune with changes in technology.
- Seats are reserved for SC/ST, OBC, differently abled and women candidates as per norms. There is a provision of re-affiliation for existing affiliated ITIs for more than 5 years old to ensure standards/norms prescribed by NCVT.
- Work of inspection & accreditation of ITIs has been entrusted to the Quality Council of India with effect from 1.9.2012 and applications are submitted online for opening of new ITIs as well as addition of trades in existing ITIs.

APPRENTICESHIP TRAINING SCHEME

The Apprentices Act, 1961 was enacted with the objective of regulating the programs of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart apprenticeship training on the job in industry. The apprenticeship training is for youth and person having National Trade certificate issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry.

Apprenticeship training refers to a course of training in any industry or establishment. Apprenticeship training consists of basic training (theoretical instructions) and practical on the job training at actual work place.

Any individual, who has completed 14 years of age, is physically fit and having minimum educational qualification prescribed for a trade can undergo apprenticeship training.

Benefits of apprenticeship training

Apprentices get an opportunity of undergoing 'on the job' training and are exposed to real working conditions. They get a chance to work on advanced machines and equipment, industry specific best practices and learn more about their field. Apprentices become skilled workers once they have acquired the knowledge and skills in a trade or occupation, which help them in getting wage or self - employment. In addition, apprentices get stipend at the prescribed rates during the training.

One can undergo apprenticeship training in any industry/ establishments in the Central/State Public Sector or Private Sector, where apprenticeship seats are available.

Categories of apprentices

There are four categories of apprentices namely

- a. Trade apprentice
- b. Graduate apprentice
- c. Technician apprentice
- d. Technician (vocational) apprentice

a. Trade apprentice

A person undergoing apprenticeship training in any designated trade. Designated trade is any trade / occupation / any subject field in engineering / non - engineering / technology / any vocational course as notified by the Government.

8th, 10th, 12th standard and ITI pass - outs are eligible to undergo apprenticeship in designated trades for trade apprentices. In certain trades, B.Sc. pass is also a prescribed qualification.

b. Graduate apprentice

A person who holds a degree in engineering /non - engineering and undergoing apprenticeship training in designated trade.

c. Technician apprentice

A person who holds a diploma in engineering / non - engineering and undergoing apprenticeship training in designated trade.

d. Technician (vocational) apprentice

A person who holds certificate in vocational course after the completion of the secondary stage of school education recognized by the All - India Council.

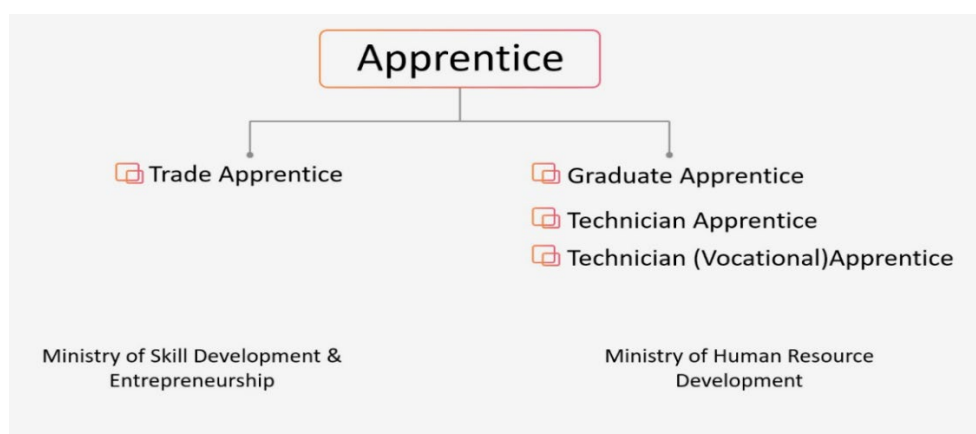


Figure 2: Types of Apprentice

Ministry of Skill Development & Entrepreneurship is responsible for monitoring the implementation of the Act with respect to trade apprentices. Graduate, Technician and Technician (Vocational) apprentices are covered by the Ministry of Human Resource Development.

B. POLYTECHNICS

The Diploma in Engineering or Diploma in Technology is a program focused on practical and skills-oriented training. Many countries in the world recognize it, as equivalent to pre-engineering or bridging course when considered for continuing studies in engineering related bachelors or associate degree programs. In India, Diploma in Engineering is a

3-year course awarded in specific branch of engineering. It is usually offered in polytechnic institutes recognized by the respective State Boards of Technical Education.

Candidates seeking admission into Full-Time and Part-Time Diploma Courses shall be required to have passed X standard examination of the State Board of Education, or any other equivalent examination already recognized by the Directorate of School Education Board. The age of the candidate must be 15 +

Candidates seeking admission to the Second Year (III Semester) of Regular Diploma Courses under Lateral Entry shall be required to have passed the Higher Secondary Certificate Examination (HSC) in Physics, Chemistry and Mathematics (PCM) combination, (Vocational) or 2-year Industrial Training Institute (ITI) Certificate Examination after passing X Std. examination of State Board of Education. Admission criteria is prescribed by the State Directorate of Technical Education.

Diploma in Engineering is a technical course that only covers the essentials when ranked with an undergraduate engineering degree. It aims to provide students with industry or job related engineering knowledge, scientific skills, computing and analysis, mathematical techniques, a sound knowledge of English to communicate in the field and ability to apply problem solving techniques.

Diploma in Engineering is a specific academic award usually awarded in technical courses e.g. Civil Engineering, Mechanical Engineering, Chemical Engineering, Electrical Engineering, etc. A few institutions also offer programs in areas like Chemical Technology, Leather Technology, Textile Technology, Catering Technology, Architecture and Pharmacy. Some institutions also offer programs in non-engineering subjects like Commercial Practice, and Library Science.

90% of the Polytechnics follow the curriculum prescribed by the respective State Boards of Technical Education. Only 10% of them have Academic Autonomy. In Tamil Nadu, the government is revolutionizing its technical education by upgrading its diploma courses with newer schemes (L Scheme, M scheme and forward) to make it equivalent with UK's Higher National Diploma (HND) programs.

The ratio of weightage between theory (knowledge) and skill is approximately 50:50. Sandwich type of programs (in collaboration with industries) are offered by about 10% of the Polytechnics. Public examination is conducted by State Directorate of Technical Education.

- Based on the funding agency, they are classified into three types
- Government Polytechnics
- Government Aided Polytechnics
- Un-aided Polytechnics / (Self-financing) Polytechnics

After successful completion of Diploma in Engineering course, students can either continue further Engineering studies in undergraduate level or get employment as Junior Engineers, technicians, technologists, supervisors, superintendents, foremen, machinist, workshop technicians, draftsman, station technicians in the field of energy, thermal, aeronautics, automobile technicians, maintenance and service technicians, equipment mechanics and technicians, CAD/CAM programs, agricultural overseers, instrument technicians, junior instructors, manufacturing, tool and die designers, electricians...etc. Some become entrepreneurs or join colleges for higher studies. Diploma Holders can sit for the examination of Associate Member of the Institution of Engineers (A.M.I.E) membership, from Member of Indian Institution of Industrial Engineering, Navy Mumbai which is equivalent to the Associate engineering bachelor's degree.

Diploma holders can enroll for advanced diploma programs in concentrated job sectors within their area of study. Diploma holders are also eligible for lateral entry to the third semester Engineering Courses in various Technical Universities.

C. ENGINEERING COLLEGES

In India, there are numerous engineering colleges imparting undergraduate and graduate courses in engineering, applied engineering and sciences. The Indian Institutes of Technology (IITs), National Institutes of Technology (NITs) and all State & Central government owned Engineering & Technology College & Universities are considered the best in the country. The graduates from IITs and NITs earn higher as compared to the graduates of other engineering institutes. Many public sector companies prefer to recruit graduates from IITs and NITs as they are very technically skilled and curriculum in those institutes are extremely

competitive. Number of seats available in IITS is around 11,000 and in NITs are around 18000 and in IIIT (Indian Institutes of Information Technology) is around 3500. It may vary year wise. Around 1.5 million engineers pass out every year from our country.

Engineering Colleges admit students who have passed 12th grade (who have completed higher secondary education) and provide education leading to the award of Bachelor's degree. Duration of the Degree program is usually four years. The Engineering Programs are offered in Civil, Mechanical, Electrical, ECE (Electronics and Communication Engineering), CSE (Computer Science Engineering), Production, Manufacturing, Bio chemistry, Aerospace, etc., and Technology programs in Chemical, Leather Textile, Biotechnology etc. There are Architecture programs like Bachelor of Architecture (B.Arch.).

Curriculum is prescribed by the University to which the college is affiliated. Less than 10% of institutions have academic autonomy. The ratio of weightage between theory (knowledge) and skill is approximately 70:30. Sandwich types of programs are offered by very few institutions. Public Examinations are conducted by the University to which the college is affiliated.

After completing, the graduates most of them go for

- Employment in Industries
- Entrepreneurs
- Joining PG Programs
- Employment as Teachers of Technical Education Institutions
- R & D Engineers

Engineering Colleges may be classified based on the nature of governance:

- Engineering Colleges affiliated to a Central / State University
- Engineering Education programs conducted by Deemed Universities
- Engineering Departments which are constituent parts of a general or Technical University.
- National Institutes of Technology (Formerly known as Regional Engineering Colleges)
- Institutes of National importance like Indian Institutes of Technology

Classification of Engineering Colleges based on the funding agency:

- Government Engineering Colleges
- Government Aided Engineering Colleges
- Un-aided (Self-financing) Engineering Colleges

The world is changing, and engineers are the ones behind country's development. The majority of today's services and products had some element of engineering involved in their conception at least, paving the way to long, fulfilling and healthy lives for the people influenced by them. Engineers must be critical yet creative; curious yet capable; as well as ready to handle the constantly changing world.

In an advanced technological world, we need engineers to bring ideas into reality. By applying the principles of mathematics and science, engineers develop solutions to the world's biggest technical issues. As quoted by N.R. Narayana Murthy "Engineering or technology is all about using the power of science to make life better for people, to reduce cost, to improve comfort, to improve productivity, etc.".

D. UNIVERSITIES

Central universities

Central universities, or Union universities are established by Act of Parliament and are under the purview of the Department of Higher Education in the Union Human Resource Development Ministry. There are 49 Central universities in the country like University of Delhi, University of Allahabad and Indira Gandhi National Open University.

State Universities

State Universities are set up or recognized by an act of the state legislature. There are 281 state universities in the country. Three of the country's oldest institutions of higher learning, University of Calcutta, University of Madras and University of Bombay are state universities.

Higher Learning Institutes that are not universities but are often in recognition of their high caliber of education that are granted the status of a university are called Deemed Universities. As in other universities, students are conferred degrees upon completion of their programs.

There are 131 deemed universities in the country. For example, NIT (National Institutes of Technology), IISC, Bengaluru, etc.

Private university

A private university is an institution of higher learning established through a state or central act by a sponsoring body, such as a society registered under the Societies Registration Act, 1860, or any other corresponding law for the time being in force in a state or a public trust or a company registered under Section 25 of the Companies Act, 1956. They need to be recognized by UGC to provide a valid degree. There are 87 private universities in India. For example, BITS Pilani.

Open University (OU)

An Open University (OU) that is open to people without formal academic qualifications and where teaching is by correspondence or broadcasting or summer school. It is notable for having an open entry policy, i.e. a student's previous academic achievements are not taken into account for entry to most undergraduate/post-graduate courses.

The OU uses a variety of methods for distance learning, including written and audio materials, the Internet, disc-based software and television programs on DVD, Course-based television broadcasts. Materials are composed of originally-authored work by in-house and external academic contributors and from third-party materials licensed for use by OU Students.

E. INSTITUTE OF NATIONAL IMPORTANCE (INI)

Institute of National Importance (INI) is a status that may be conferred to a higher education institution in India by an act of parliament, an institution that "serves as a pivotal player in developing highly skilled personnel within the specified region of the country/state". There are 59 such institutions in the country. The common examples are IITs, ISI (Indian Statistical Institute), and IIITs.

Institutes Under State Legislatures Acts

These are institutes established under the act of the State legislation. Examples include Nizam's Institute of Medical Sciences, Hyderabad and Sri Venkateshwara Institute of Medical Sciences, Andhra Pradesh. There are 5 such institutes in India.

4.0 NATIONAL AGENCIES

A. MINISTRY OF HUMAN RESOURCE DEVELOPMENT (MHRD)

The 42nd Amendment of the Indian Constitution in 1976 brought about drastic changes in the Indian Constitution. As far as education was concerned, it may be taken to be a historic step. Before 1976, education was a state subject, while the Central Government used to play an advisory role. However, the persons related to educational Administration felt that education should be the joint responsibility of the Central and the State Governments. The idea was put into practice by a Constitutional amendment in 1976. As a result, education was put on the Concurrent List with the implication that both the Centre and the States can legislate on any aspect of education from the Primary to the University level. With education in the Concurrent List, the Centre can directly implement any policy decision in the States.

As a result of education being brought under the Concurrent List,

- Union Government lays down the norms and standards for education to be followed and maintained by the States. The Centre has set up institutions like the University Grants Commission (UGC) for such purposes.
- Moreover, running of some special institutions is the responsibility of the Union Government. The special institutions are the Banaras Hindu University, the Aligarh Muslim University, the Delhi University, the Jawaharlal Nehru University, the other Central Universities, the National Library, the National Museum, NCERT, IITs, UGC, NITs, NITTTRs, etc.
- Further, one of the functions of the Central government is co-ordination and determination of standards in institutions for higher education or research and scientific and technical institutions.

Hence, The Department of Higher Education, MHRD, is responsible for the overall development of the basic infrastructure of Higher Education sector, both in terms of policy and planning. Under a planned development process, the Department looks after expansion of access and qualitative improvement in the Higher Education, through world class Universities, Colleges and other Institutions.

Objectives

- To expand the Higher Education sector in all its modes of delivery to increase the Gross Enrolment Ratio (GER) in Higher Education to 30% by the year 2020.
- To expand institutional base of Higher Education (including technical, professional and vocational education) by creating additional capacity in existing institutions, establishing new institutions and incentivizing State Governments and Non-Governmental Organizations/civil society.
- To provide opportunities of Higher Education to socially-deprived communities and remove disparities by promoting the inclusion of women, minorities and differently-abled persons.
- To remove regional imbalances in access to Higher Education by setting up of institutions in unnerved and underserved areas.
- To enhance plan support for infrastructure and faculty development in the institutions of higher learning and to attract talent towards careers in teaching and research.
- To create conditions for knowledge generation through improved research facilities in universities and colleges.
- To promote collaboration with International community, foreign governments, universities/institutions and regional and international institutions, for the advancement of universal knowledge and intellectual property rights.
- To promote development of Indian languages.
- To promote autonomy, innovations, academic reforms in institutions of higher learning

- To undertake institutional restructuring for improving efficiency, relevance and creativity in Higher Education.

Initially, the Engineering and Polytechnic Colleges were under the control of the Directorate of Public Instruction and Directorate of Industries and Commerce respectively. The Industrial schools were under the overall control of Department of Labor, Employment and Co-operation.

B. ALL INDIA COUNCIL FOR TECHNICAL EDUCATION (AICTE)

The All India Council for Technical Education (AICTE) was setup on 30th November, 1945 by a resolution of the Government of India on the recommendation made by Central Advisory Board of Education (CABE).

Abbot Wood Report, 1936-37

Two expert advisors, Messrs. A. Abbot, formerly chief Inspector of Technical Schools Board of Education, England and S.H. Wood Director of Intelligence Board of Education, England, were invited to advise the government on certain problems of educational reorganization and particularly on problems of vocational and technical education. The report of Messer's Abbot and Wood recommended major reforms in educational system by suggesting a complete hierarchy of vocational and technical institutions parallel to that of institutions imparting general education.

The Government of India realized that it was necessary for the Centre to support, coordinate and promote research in technical education. The most vital was creation of Board of Scientific and Industrial Research in 1940 to promote Industrial Research. Second was the establishment of Delhi Polytechnic in 1941. Based on their recommendations, a new type of technical Institutions called "Polytechnics" came into existence for training of middle level technical personnel. In 1943, Constitution of the Technical Education Committee of the Central Advisory Board of Education (CABE) was formed.

Sargent Report (1944)

Sir John Sargent, the Educational Adviser to the Government of India was asked to prepare a comprehensive report on education. For the purpose, the government formed a Committee of Enquiry with 22 members. The report of the committee was submitted to the Central Advisory Board of Education (CABE) in 1944. The Board accepted it in 'Toto' and recommended its enforcement. The scheme was known as 'Sargent Scheme of Education' as it was prepared by John Sargent. It is also known as 'Report by the Central Advisory Board of Education' and as the plan for post-war educational reconstruction in India.

Thirdly in 1945, an ad hoc committee popularly known as Sarkar Committee was appointed for advising on the lines of the Massachusetts Institute of Technology. Fourthly, on 30th November, 1945, the All India Council for Technical Education (AICTE) was setup by a resolution of the Government of India on the recommendation made by Central Advisory Board of Education (CABE) as a national-level apex advisory body to conduct a survey on the facilities available for technical education and to promote development in the country in a coordinated and integrated manner.

Lastly in March 1947, Scientific Man Power Committee was appointed to assess the country's requirements for different grades of the scientific and technical personnel during the next ten years and to recommend the measures to meet them. That was the genesis of AICTE.

Let us investigate the responsibilities of AICTE.

AICTE was vested with number of responsibilities as stipulated in the National Policy of Education (1986). They are

- Statutory authority for planning, formulation, and maintenance of norms & standards
- Quality assurance through accreditation
- Funding in priority areas, monitoring, and evaluation
- Maintaining parity of certification & awards
- The management of technical education in the country
- Role of National Working Group

The Government of India (the Ministry of Human Resource Development) also constituted a National Working Group to investigate the role of AICTE in the context of proliferation of technical institutions, maintenance of standards, and other related matters. The Working Group recommended that AICTE be vested with the necessary statutory authority for making it more effective, which would consequently require restructuring and strengthening with the necessary infrastructure and operating mechanisms.

The All India Council for Technical Education Act 1987 (No 52 of 1987 as passed by both the Houses of Parliament). The AICTE Act was constituted to provide for the establishment of an All India Council for Technical Education with a view to proper planning and coordinated development of a technical education system throughout the country, the promotion of qualitative improvements of such education in relation to planned quantitative growth, and regulation & proper maintenance of norms and standards in the technical education system and for the matters connected therewith.

The purview of AICTE (the Council) covers programs of technical education including training and research in Engineering, Technology, Architecture, Town Planning, Management, Pharmacy, Applied Arts and Crafts, Hotel Management and Catering Technology etc. at different levels.

C. UNIVERSITY GRANTS COMMISSION (UGC)

The University Grants Commission (UGC) of India is a statutory organization set up by the Union government in 1956, charged with coordination, determination and maintenance of standards of university education. It provides recognition to universities in India, and disburses funds to such recognized universities and colleges. Its headquarters are in New Delhi, and six regional centers in Pune, Bhopal, Kolkata, Hyderabad, Guwahati and Bangalore.

If we look into the history of UGC, UGC was recommended in 1945 and formed in 1946 to oversee the work of the three Central Universities of Aligarh, Banaras and, Delhi. In 1947, the Committee was charged with the responsibility of handling all the then existing Universities. After independence, the University Education Commission was set up in 1948 with Dr. S. Radhakrishnan as the Chairman and it is recommended that the UGC to be reconstituted on the general model of the University Grants Commission of Britain. UGC was formally

inaugurated by Abdul Kalam Azad, the then Minister of Education, Natural Resources and Scientific Research on 28 December 1953. The UGC was however, formally established in November 1956, by an Act of Parliament as a statutory body of the GOI.

UGC Role and Functions

The prime functions of the University Grants Commission are as follows:

- It provides funds to the various higher educational institutes.
- It carries out the function of coordination, determination and maintenance of standards in institutions of higher education.

In addition to these the University Grants Commission also performs the following functions as well:

- Promoting and coordinating university education.
- Determining and maintaining standards of teaching, examination and research in universities.
- Framing regulations on minimum standards of education.
- Monitoring developments in the field of collegiate and university education; disbursing grants to the universities and colleges.
- Serving as a vital link between the Union and state governments and institutions of higher learning.
- Advising the Central and State governments on the measures necessary for improvement of university education.

D. NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH (NITTTR)

To remove the deficiencies of the Polytechnic institutions and to train better teachers for polytechnics, on the recommendation of the AICTE, the Central Government started four Technical Teachers' Training Institutes.

They are four in number and they were established in the years between 1964 and 1967,

- Chennai for Southern Region (1964)
- Kolkata for Eastern Region (1965)
- Bhopal for Western Region (1966)
- Chandigarh for Northern Region. (1967)

After the formation of Technical Teachers' Training Institutes (TTTIs), within a short span of 25 years, several review committees were constituted by the Government to review the scheme of the TTTIs such as, Kelkar Committee (1976), Jha Committee (1978), Bhattacharya Committee (1991) and Indiresan Committee (2000).

The following recommendations were made for optimal utilization of the facilities, expertise and experience available in the four TTTIs.

- Extension of reach of the Institute over the entire gamut of the Technical Education.
- Training of teachers in other sectors apart from the polytechnic education should be undertaken
- Efforts must be made to get the degrees like M.Tech. Ed. / M.E.E. courses recognized for career advancement.
- Emphasis on Educational Technology including Distance Education & web based learning.
- Training for overseas teachers particularly from SAARC and ASEAN countries.
- Helping the polytechnics by aiding in laboratory development, improvement of instruction, testing and evaluation.
- Integration of IT in Teacher Training.

TTTIs were upgraded and renamed as National Institute of Technical Teachers' Training & Research (NITTTR) vide Government of India order dated 20th October, 2003 with an objective to play larger role for the improvement of Technical Education in the country.

These institutes strive to cater to needs of Technical Education system particularly in training of faculty both in pedagogy and in domain areas and thus promoting Excellence in Technical Education. They offer in-service training and development programs for the staff of

polytechnics and Engineering Colleges, need based Human Resource Development programs through appropriate modes and develop curricula and instructional resources.

They also foster research in the inter disciplinary area of Technical / Engineering Education and offer consultancy and extension services for the total development of Engineering Colleges, Polytechnic Colleges, Vocational institutions, Industry, Service sector and the Community at large.

E. DIRECTORATE OF TECHNICAL EDUCATION (DTE)

There was no machinery responsible for the coordinated development of Technical Education in its different branches and at different levels. As a result, the Directorate of Technical Education was established with the objective of bringing about coordinated development of Technical Education in the State with effect from 14th October 1957 consequent to the suggestion made by the State Standing Advisory Board of Technical Education.

DTE, is in charge of academic and administrative management of the technical education system. Expansion of technical education depends upon the State's needs as realized by the respective State Governments. However, AICTE's approval is needed for

- Starting of new institutions
- Starting of New programs in the existing institutions
- For increasing the student intake in existing programs

The mandate of the DTEs include the following

- Select and admit students into engineering colleges and polytechnics as per prescribed norms.
- Develop suitable curricula, conduct examinations and award diplomas / certificates.
- Recognize institutions that offer diploma and certificate programs and evaluate the performance of students
- Ensure adequate human resources and infrastructural facilities in all the technical education institutions to impart education and training as per the respective norms of the universities / State Board of Technical Education / AICTE

- Provide finance to and supervise its utilization by the technical education institutions (Govt. and Govt. Aided) for development of facilities / resources.
- Implement the Programs and Policies of the State Government with respect to the development of technical education.

F. INDIAN SOCIETY OF TECHNICAL EDUCATION (ISTE)

- Indian Society of Technical Education (ISTE) is a professional society of technical teachers, administrators and students.
- About 70% of the teachers in technical institutions are members of the ISTE. Major Activities of ISTE
 - Summer / Winter schools for teachers
 - Development of instructional resources
 - Publication of Newsletter, Journal, Handbook and Instructional materials
 - National and State awards to individuals and institutions
 - Advocacy for formulation of Policies by Central and State Governments

5.0 ACTIVITIES AND REFLECTION QUESTIONS

Activity 1

1. What is meant by formal, informal and non-formal education. Give examples. Each has its own merits and demerits. List at least one advantage and one disadvantage for each

Activity 2

2. Look for Industrial Training Institute (ITIs) in your geographical area. Mention the areas of trades offered with duration. Also explore the curriculum for any one trade.

Activity 3

1. Find out the number of Polytechnics available in your State.
 - Government Polytechnics
 - Government Aided Polytechnics
 - Self- Financing / Private Polytechnics
2. Out of these Polytechnics, which Polytechnics have Academic autonomy.
3. How do Sandwich diploma courses differ from Regular Diploma Courses

Activity 4

4. Visit AICTE website

<https://www.aicte-india.org/>

Learn more about the various student and staff development Schemes by AICTE.