

**TECHNICAL EDUCATION SYSTEM IN INDIA: PRESENT SCENARIO**

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**ABSTRACT**

*Technical Education system is dynamic in nature. It faces many challenges in environment. Technical education is widely recognized as an important part of the total education and training system. The real challenge is how to reposition it in response to the global forces driving change in a knowledge based economy. Since Independence in 1947, the Technical Education System has grown into a fairly large-sized system, offering opportunities for education and training in a wide variety of trades and disciplines at certificate, diploma, degree, postgraduate degree and doctoral levels in institutions located throughout the country. Even though the system boasts of institutions comparable to the best in the world, quality of education offered in majority of institutions leaves much to be desired.*

*The main objective of this paper is to understand the concept of technical education system and some useful insights on the underlying philosophy, policies, choices and rationale, which have helped to shape the systems of technical education and training in India.*

**Keywords:** *Technical Education System, Role, Challenges, Opportunities*

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## INTRODUCTION

Education is of several types and patterns. There is, for example, the arts education, the scientific education, the religious education, the physical education, the education of education. In India, as in other countries, much stress has been laid on the promotion of technical education since the attainment of independence. India's economic ills are sought to be overcome through a process of industrialization for which, in turn, technical education is very essential. In other words, technical education is a vital prelude to India's property.

The scope of technical education is very comprehensive. It incorporates within itself all subjects of study in engineering and technology. Civil engineering, mechanical engineering, electrical engineering, mining engineering, aeronautical engineering, metallurgical engineering, industrial engineering, chemical engineering, agricultural engineering, production engineering, and a host of other fields of engineering form part of technical education. Similarly, there are various subjects in technology, namely, leather technology, paint and varnish technology, food technology, fuel technology, marine technology, textile technology, etc., which fall within the purview of technical education.

It is only during **World-War II** that technical and vocational education received encouragement in India. But the number of technicians and engineers was very small in comparison with India's need. So free India turned her immediate attention to technical education. A large number of technical institutions have been opened.

There are both diploma and degree courses. Post-graduates and research training is also imparted. There are many colleges for engineering. Polytechnics have also been set up all over India. For the development of higher technical education Indian Institutes of Technology have been established at Delhi, Kharagpur, Bombay, Kanpur and Chennai. The Indian Institute of Science at Bangalore has been reorganized and several new departments have been added. Stipends for practical training abroad and scholarship for the promotion of research in universities and technical institutions are being awarded. Then, there has been set up All India Council of Technical Education. It looks to the development of scientific and technical education and research in the Indian universities and technical institutions of higher training. The Defence, Labour and Rehabilitation Ministries have opened a large number of training centres all over the country to impart training to lower grade technical personnel.

**Technical Education** As per the provisions AICTE Act , “Technical Education” means programmes of education, research and training in the following fields:-

- Engineering & Technology
- Architecture
- Town planning & Management
- Pharmacy & Applied Arts and crafts
- Such other programmes or areas as the Central Govt. may declare in consultation with the council by a gazette notification

### **OBJECTIVES OF THE STUDY**

- To understand the concept of technical education system.
- To study the present system of Technical education in India.
- Role of Government in Technical education in India.
- Challenges of Technical education in India.
- SWOT analysis of Technical education in India.

### **HISTORY OF TECHNICAL EDUCATION IN INDIA**

The history of imparting formal technical education in India can be traced back to mid 19th century, although it got momentum in 20th century with the set up of Constitution of Technical Education Committee of the Central University Board of Education (CABE) in 1943; Preparation of Sergeant Report in 1944 and Formation of All India Council of technical Education (AICTE) in 1945. With the country gaining independence in 1947, the development of technical education had become a major concern for the government of India to face the new challenges and move the country forward.

The set up of Indian Institutes of Technology, Indian Institutes of Management and Indian Institutes of Science was a major step in the development of technical education in the country. The quality of education of these institutes has managed to change the outlook of India so much that this ancient country which was earlier known for yoga and mediation is now known for computer engineers. However, it does not mean that the challenge of making technical education accessible to the rural populace and other under developed sections of the society has been overcome.

In order to maintain the standard of technical education, a statutory authority- The All India Council for Technical Education (AICTE)- was set up in 1945. AICTE irresponsible for planning, formulation and maintenance of norms and standards, quality assurance through accreditation, funding in priority areas, monitoring and evaluation, maintaining parity of certification and awards and ensuring coordinated and integrated development and management of technical education in the country.

### **PRESENT SYSTEM OF TECHNICAL EDUCATION**

- Since Independence in 1947, the Technical Education System has grown into a fairly large-sized system, offering opportunities for education and training in a wide variety of trades and disciplines at certificate, diploma, degree, postgraduate degree and doctoral levels in institutions located throughout the country. Even though the system boasts o institutions comparable to the best in the world, quality of education offered in majority of institutions leaves much to be desired.
- In the year 1947-48, the country had 38-degree level institutions with intake capacity of 2500 and 53 diploma level institutions with intake capacity of 3670. The intake for postgraduates was 70.
- There was rapid expansion of the system in the next 20 years. By 1967-68, the number of degree level institutions had increased to 137 with intake capacity of 25,000; and for diploma to 284 institutions with intake capacity of 47,000.
- In the year 2000, the total size of the system had increased to 4146 institutions with approved intake capacity of 544,660. These include 838 engineering degree institutions with admission capacity of 232,000 students; and 1224 engineering diploma institutions with admission capacity of 188,000.
- Approximately, two-thirds of these institutions were in the private sector. Postgraduate education was being offered in 246 institutions with admission capacity of 21,460.

### **TENTH PLAN PERFORMANCE**

The Tenth Plan period saw a big increase in the number of technical and management institutions, mainly due to private initiatives. During the Tenth Plan, the number of AICTE approved Degree Engineering/

Technology institutions has raised from 1057 to 1522 and the annual intake from 2.96 lakh to 5.83 lakh. The aggregate number of technical institutions and the intake capacity by the end of

Tenth Plan were 4512 and 7.83 lakh, respectively. The Tenth Plan outlay for the technical education sub-sector was Rs 4700 crore, against which an expenditure of only Rs 3416 crore was incurred (73%).

## **TECHNICAL EDUCATION: GOALS AND TARGETS IN ELEVENTH PLAN**

During the Eleventh Plan, intake of technical education institutions needs to grow at an estimate 15% annually, to meet the skilled manpower needs of our growing economy.

### **Schemes for Expansion and Upgradation**

The Eleventh Plan envisages setting up of 8 new IITs, 7 new IIMs, 10 new NITs, 3 IISERs, 20 IIITs, and 2 new SPAs. In establishing these institutions the scope for PPPs will be explored. Seven selected technical institutions will be upgraded subject to their signing MoU on commitments to making reforms in governance structure, admission procedure, etc. and aligning with character of the national institutions. In the location and selection of sites for the new institutions, clustering will be a key consideration and the States will be incentivized for co-locating institutions in strategic locations.

## **TECHNICAL EDUCATION COURSES IN INDIA:**

The courses, which are known as 'technical' in India and therefore come under the purview of All India Council of Technical Education are - degree and diploma courses in Engineering, Master degree Courses in Engineering, Master of Computer Application (MCA), Master of Business Administration (MBA), Pharmacy Courses, Courses in Architecture and Applied Arts and Hotel Management and Catering Technology Courses.

## **INSTITUTES OFFERING TECHNICAL EDUCATION IN INDIA:**

As the technical education courses in India are quite diverse, the number of institutes providing technical courses in India is also huge. The number of AICTE approved institutes that offer engineering degree courses in India is 4,39,689. There are around 1244 institutes in India that offer diploma courses in engineering, 415 institutes offer diploma courses in Pharmacy, 63 institutes offer diploma courses in Hotel Management and Catering Technology Courses and 25 AICTE approved institutes that offer diploma courses in Architecture. The number of AICTE approved institutes that offer master of Computer Application courses in India is 1012.

Likewise the AICTE also approves institutes from time to time institutes that offer MBA courses, M.E./M.Tech, Architecture and Applied Arts Courses, Hotel Management and Catering Technology Courses.

### **IMPORTANCE OF INSTITUTIONS**

- The Central Government, States and Union Territories have played an important role in the development of Technical Education System by establishing a large number of fully funded and aided technical institutions and by providing adequate policy support.
- At the apex of the Technical Education System in India are the seven Indian Institutes of Technology (IITs) located at Mumbai, Delhi, Kanpur, Kharagpur, Chennai, Guwahati and Roorkee, established with the objective of imparting world-class education. The IISc Bangalore was established to offer postgraduate education and to conduct research in various areas of basic sciences, engineering and technology. It is yet another world-class institution.
- The Indian Institutes of Management (IIMs) located in six cities (Ahmedabad, Bangalore, Calicut, Kolkata, Indore and Lucknow) are institutions of excellence established with the objective of imparting high quality management education and training, conducting research and providing consultancy services in the field of management to various sectors of the Indian economy.

### **ROLE OF GOVERNMENT**

The role of GOI (MHRD) will be to:

- Provide overall policy directives to the Programme to achieve the set goals and objectives including timely implementation of academic and non-academic reforms.
- Announce the First Phase of the Programme and its' various cycles and encourage Institutions in the six selected States to actively participate in the Programme.
- Coordinate and direct all activities related to the Programme including selection of States and Institutions, implementation, monitoring and evaluation for which NPIU will play the supportive role.
- Form various committees as envisaged under the Programme for smooth and timely implementation of the Programme.

- Coordinate with other Ministries/Departments such as Ministry of Finance, Planning Commission, Ministry of External Affairs, State Governments, World Bank, and other related institutions, AICTE etc for smooth functioning of the Programme. To coordinate these activities NPIU will play the supportive role.
- AICTE has agreed in principle to support the Programme and would provide expeditious approvals to various proposals of the institutions, conceived as part of vision of institutions selected under the Programme.

to be introduced in the institutions selected under the Programme. AICTE will provide expeditious approvals for starting such courses at various levels.

### **CHALLENGES AND THE WAY FORWARD IN HIGHER TECHNICAL EDUCATION IN INDIA**

- **Need for a policy framework:** Emphasizing the present status of technical education in India, Prof P Rama Rao, ARCI, and Hyderabad suggested the need for a policy framework for improving the quality of technical education in the country.
- **Need for strengthening:** In terms of the data, 97% of 10, 60,000 annual intakes of students are being accounted by the private institutions. The annual intake of students in all Indian Institute of Technology is 7,500, National Institute of Technology 35,000 and the rest i.e. 10, 17,500 is accounted by the private institutions. This, viewed along with the lowering of quality of engineering education, highlights the dysfunctional accreditation process and the need for strengthening the process to improve the quality of technical education.

Comparing the number of engineers graduating in a year, at different levels for India and the USA, Dr Rao indicated that only 5% of the Bachelor degree holders from India go for the Masters degree whereas the corresponding figure for USA is about 50%. The total Ph.D. degree holders in engineering discipline in India for the year 2009-10 is only 1500 whereas for USA it is 7500.

Looking at sector-wise data, in the field of aeronautical engineering the total number of students per year in B.Tech is 285, M.Tech 175 and PhD only 30. The scenario is not very different and encouraging for the computer science and geology disciplines. India is also witnessing an acute shortage of faculty in engineering discipline which is about 50,000.

- **Regional imbalance:** There is also a regional imbalance in engineering education establishments. More than 505 of the engineering colleges are located in Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu which does not auger well for the balanced socio-economic development of the country.
- **Absence of international flavor:** Dr Rao also identified problems like absence of international flavor in both student and faculty, low research activity across the disciplines and asymmetry in technology assessment which are areas of concern and need policy guidelines.
- **Level of excellence resources:** India has success stories in technical education and human resource generation which can guide in policy formulation. Dr Y Nayudamma's model of balanced development of the Indian leather sector through an academia-industry partnership and Institute of Chemical Technology established in the year 1933 are among the few examples that can be emulated. The level of excellence, resources and level of autonomy should be synchronized in a policy for achieving quality technical education in India in the next five years.
- **Complex relationship:** Public-Private partnership is a complex relationship which needs well thought out policy guidelines along with proper checks and balances. Drawing upon the US experience in generating wealth for the nation by investing in academic Research and Development, Dr Rao stressed the need for increasing the R & D funding in India for building and sustaining a modern and vibrant nation.

## **SWOT ANALYSIS OF INDIAN TECHNICAL EDUCATION SYSTEM**

### **Strength:-**

The strengths of Indian technical education system are:

- India has got very rich and learned education heritage.
- Very good primary education which provides a very strong base.
- Indian education system Moulds the growing minds with huge amount of information and knowledge.
- Indian education system gives the greater exposure to the subject knowledge.
- Indians are rich in Theoretical knowledge .India has abducted strength of resources and man power (NASA, MAC).
- Cost of education is very low.

- Number of higher education institutions in India is more compare to developed countries.
- Indians are interceded in normal education and higher education.

**Weakness:-**

The weakness of Indian technical education system is:

- Lack of adequate up-gradation of Curriculum. No benchmark and no common course content and no common exam procedure national wide.
- Lack of specialized courses or modular and rigid curriculum learning considered as one step process. Education is exam oriented. No fixed parameters.
- Lack of Industry –Institute interaction. Rigidity in curriculum.
- Lack of multidisciplinary courses. Role of teacher is confined to teaching alone.
- Lack of policy makers. Mind set of stakeholders.
- Lack in accepting immediate changes. Learning is job oriented.

**Opportunities:-**

- India has rich resources of human as well as physical.
- In India enough number of higher education institutions. Therefore, we can produce more and highly qualified students.
- Fulfilling students demands by providing enhanced quality of education. Producing enough number of technically skilled outputs.
- By making more Autonomy Curriculum should be made more realistic, practically biased and job oriented.
- Students will be regarded more as a customer. To provide highly technically skilled labour to the country

**Threats:-**

Similarly the threats of Indian technical education system are:

- Lack of interest and interaction from the industry in developing and collaborating in the research field.
- Threat from within of deteriorating standards of education due to lack of benchmark in terms of quality of institutions.
- Loss of quality standards by technical institutions as more and more students opt for education abroad.

- Lack of team work. Attitude of the people who fail to work collectively on a common platform.

## CONCLUSION

Given the importance of technical education in the further development of the nation, the Government of India is keen on developing some more institutes in the line of IITs, IIMs and IISCs. The Prime Minister of India has unleashed a plan to establish 8 IITs, 7 IIMs and 5 IISCs to improve the spread and quality of technical education in the country. These institutes along with various private institutes and foreign technical colleges have the potential of making technical education accessible to all sections of society in India without compromising on the quality of education.

“Tertiary education, particularly technical and engineering education educational institutions in the tertiary sector, The aim has been to enhance their autonomy. Autonomy and Accountability goes hand in hand. The situation calls for continuous Learning on the part of institutions—how to respond to the rapidly Changing environment without compromising quality ., Is critical to realize the Indian dream of becoming a competitive Player in the global knowledge economy. As part the endeavor .To improve quality of I am Extremely happy to know that the Learning Forum convened under The aegis of TEQIP, including this publication, has deliberated these Issues in great length and depth. I am sure that the outcomes shall be extremely useful to fine-tuning our technical education programmes.”

**Kapil Sibal**

**Minister of Human Resource Development**

**Government of India**

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