NEP, 2020: PERSPECTIVES AND FUTURE OF TECHNICAL EDUCATION IN INDIA

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Abstract: The NEP, 2020 provides a framework for the transformation of the entire Technical Education (TE) in order to respond to the requirements of fast-changing and knowledge-based Indian society. This article provides comprehensive information on the fair and rational system of perspectives of NEP as well as other necessary information on the processes involved in qualitative changes in TE. Broadening the scope of TE by bringing in degree and diploma programmes ; bringing closer collaborations between industry and HEIs to drive innovation and research ; using the technology to overcome the separation between technical education and other disciplines ; planning to offer technical education in multidisciplinary education institutions and programmes ; and preparing professionals in areas of greatest importance are just a few indications of NEP, 2020 perspectives towards fostering a technical education system in India which is on par with the best institutions in the words.

Index Terms: NEP-2020, Policy Perspectives, Technical Education, Technical and General Education, Industry-Institution Collaboration, TE-Current Status.

I. INTRODUCTION

By and large teaching learning processes in professional education face specific challenges as these disciplines are neither entirely *knowledge based* nor are they *skill based*. They demand individual creativity and application of both knowledge and skill on the part of the teachers and students. Lack of adequate reference materials in many disciplines further aggravates the situation. Normally, the student performance to a greater extent depends on the quality of educational institutions and their teachers. Therefore, curricula in all disciplines shall be renewed, infused with a set of carefully selected material from other disciplines, connect theory and practice, collaboration with industry, and opportunities for a variety of internships. Curriculum delivery shall focus on giving students the opportunity and strength to apply their knowledge and skills in different settings, and inculcating in them the professional dispositions and ethics.

Therefore, engineering and technology programmes shall be revised to prepare the professionals who are well prepared for both current and future practices, and are able to exploit emerging science and technology while being responsive to changing socio-economic and environmental contexts. For example, the current solution-driven, utilitarian driven programmes in managerial practices shall be changed to an interdisciplinary approach involving urban planning, social sciences and economics, intended to prepare futures managers who are able to resolve the gap between technological considerations and consonance of people's aspirations. The gap between education and the managerial practice shall be removed through a focus on preparing professionals capable of analysing society's problems.

Keeping this background, the NEP, 2020 proposes that technical education shall include degree and diploma programmes in engineering, technology, management, architecture, town planning, pharmacy, hotel management and catering technology, etc., which are critical to India's overall development. The document highlights that, not only will these sectors continue to demand well-qualified graduates for several decades, but there will be a greater need for closer collaboration between industry and institutions to drive innovation and research. Further, the document propagates that, as the influence of technology on all human endeavours develops the gap between technical education and other disciplines are expected to overcome.

Technical education shall also aimed to be offered within multidisciplinary educational institutions and programmes and shall have a renewed focus on opportunities to engage deeply with other disciplines. India must also take the lead in preparing professionals in cutting-edge areas that are fast gaining prominence, such as Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning, in addition to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth. (para 20.6).

II. CURRENT STATUS OF TECHNICAL EDUCATION IN INDIA

The growth of Technical Education in the Country before independence was very slow. The number of Engineering Colleges and Polytechnics in 1947 was 44 and 43 respectively with an intake capacity of 3200 and 3400 respectively.

Due to the efforts and initiatives taken during successive Five-year Plans and particularly due to Policy changes in the eighties to allow participation of Private and Voluntary Organizations in the setting up of Technical Institutions on self-financing basis, the growth of Technical Education has been phenomenal. Technical Education at all levels in the Country is witnessing a consistent growth pattern marked by the setting up of new Technical Institutions, and the improvement of the existing ones in tune with the quality assurance norms set by the regulating and accreditation agencies.

Figure – 1 : Status of Technical Institutions in India
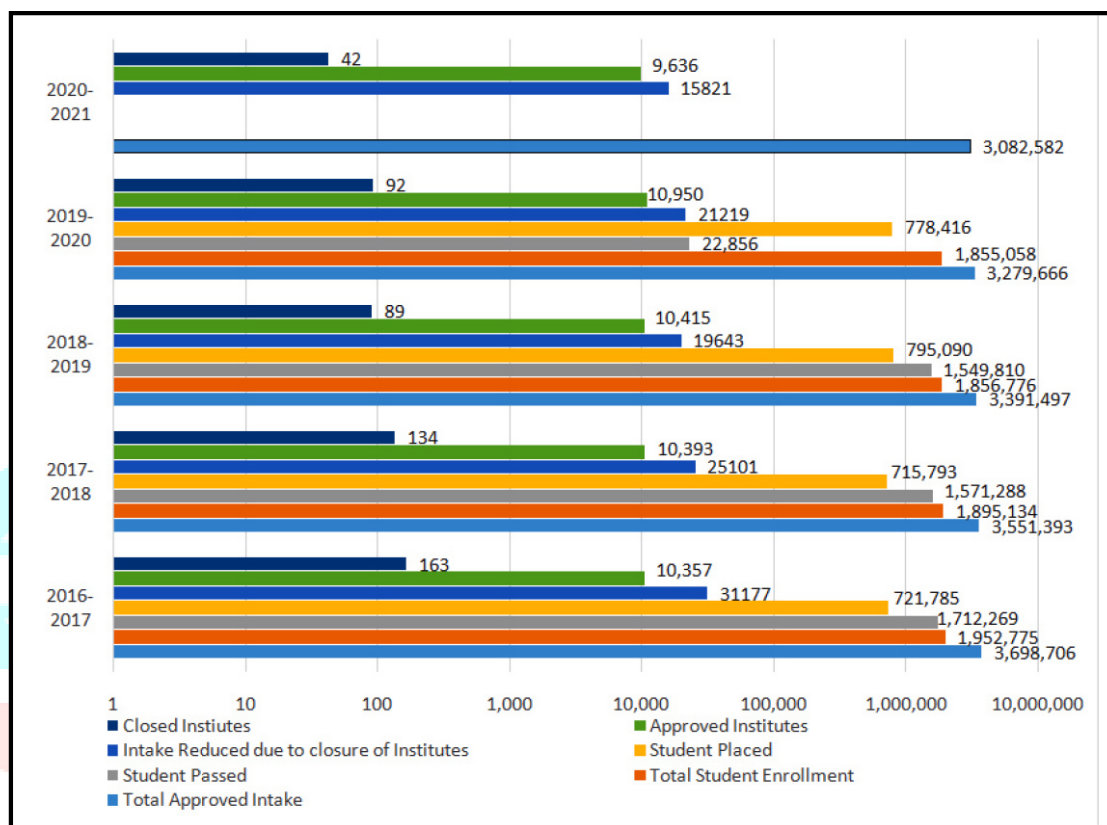
(Source: AICTE Process Handbook)

III. POLICY PERSPECTIVES ON TECHNICAL EDUCATION

The National Education Policy aims to facilitate an inclusive, participatory and holistic approach, which takes into consideration field experiences, empirical research, stakeholder feedback, as well as lessons learned from best practices. It is a progressive shift towards a more scientific approach to education. The prescribed structure will help to cater the ability of the child-stages of cognitive development as well as social and physical awareness. If implemented in its true vision, the new structure can bring India at par with the leading countries of the world.

The All India Council for Technical Education (AICTE) has been in existence since 1945 as a National Level Apex Advisory Body and as a statutory body through an Act of Parliament in 1987 with its mission of developing and promoting quality Technical Education in the Country in a coordinated and integrated manner. The Council's constant endevour is to encourage a meaningful association between the Technical Education system and research and developmental activities in a concerted effort aimed at national building.

Technical Education at all Levels is witnessing a severe competition and only those Institutions who strive for excellence will survive. The Council believes in providing all kinds of support and encourage institutions to think beyond the Curriculum while imparting training for the advancement of knowledge.

The NEP, 2020 postulates that the year 2019-2020 and the period till date has been a year of great transformation in the educational scenario. The Council has undertaken major activities during this year. NEP, 2020 approved by the Union Cabinet is set to bring a bunch of major changes. One of the stated aims of the policy is to instill a 'deep-rooted pride' in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being.

Certain activities which AICTE is already focused towards the changes as proposed in the NEP, 2020 since last three years by means of various initiatives and activities such as preparation of 'Short and Medium Term' Perspective Plans for Engineering Education in India which focuses on the demand for courses on Artificial Intelligence (AI), Internet of Things (IoT),

Machine Learning, Block Chain, Robotics, Quantum Computing, Data Sciences, Cyber Security, 3D Printing and Design and other emerging technological areas.

AICTE is for a transparent and a robust system of governance with portals for approval process, vocational programme, internship and other activities and initiatives. The vision of the organization is to see itself as a world class body in technological and socioeconomic development of the Country by enhancing the worldwide competitiveness of technical manpower.

AICTE is receptive to the technological changes happening across the scenario and believes in framing new policies and initiatives and augment the existing ones by scheduling workshops, conference, etc., providing a platform of discussion and inputs from stakeholders. It has been the endeavor of AICTE to bring the best educational system for its students and be the epitome of developing bright, noble and humble brains in the light of the NEP, 2020.

IV. NEP, 2020: PROVISIONS OF TECHNICAL EDUCATION

The National Education Policy, 2020 provides a framework for the transformation of the entire technical education system (para 20.6) in order to respond to the requirements of fast-changing and knowledge-based Indian society. These following principles should guide reforms in the contents and processes of technical education.

- Technical education includes *degree* and *diploma programmes* in *engineering, technology, management architecture, town planning, pharmacy, hotel management, catering technology,* etc., which are critical to India's overall development

- There will not only be a greater demand for well-qualified manpower in these sectors, it will also require *closer collaborations between industry and HEIs* to drive innovation and research in these fields.

- Furthermore, influence of technology on human endeavours is expected to *overcome the separation between technical education and other disciplines* too.

- Technical education will, thus, also aim to be offered within *multidisciplinary education institutions and programmes* and have a renewed focus on opportunities to engage deeply with other disciplines.

- India must also take the lead in *preparing professionals in areas of greatest importance* that are fast gaining prominence, such as *Artificial Intelligence (AI), 3-D machining, big data analysis,* and *machine learning*, in addition to *genomic* studies, biotechnology, nanotechnology, neuroscience, with important applications to *health, environment,* and *sustainable living* that will be *woven* into *undergraduate education* for *enhancing the employability of the youth.*

V. FUTURE CHANGES IN TECHNICAL EDUCATION

i. Technical Education as a part of General Higher Education

A new National Education Policy finally approved in the Union Cabinet on July 29, 2020 is a 3rd education policy (1968 & 1986) after a gap of 34-years has recommended for major changes in School Education, Higher Education as well as in Technical Education. While for School Education, the 10+2 structure has been replaced by 5+3+3+4, multiple entry and exist system has been introduced in Higher Education. There are even major changes like elimination of stream concept like Science, Arts and Commerce, implementation of 4-years of undergraduate programs, termination of M.Phil. programs, etc., with regard to Technical Education, it will be merged into the General Higher Education.

Multiple entry and exist option will enable the students to get a good return of time. Every year of graduation will add an equivalent degree in their career. Only the first year will make the student eligible for a certificate course completion degree. Next year the learner will be treated as an advanced diploma holder. At the completion of third year bachelor's degree will be confirmed and at the end of fourth and last year the candidate will be awarded with a research degree. With this degree the candidate will be able to complete Master's degree in only one year.

As technical education will be merged into the General Higher Education, Higher Education Commission of India (HECI) will be set up as a single overarching umbrella body for entire higher education, excluding medical and legal education. Norms are expected to be identical across the country. HEIs are supposed to enjoy academic, administrative, and financial autonomy under 'light and tight' regulation. Stage-wise mechanism is to be established for granting graded autonomy to colleges, affiliation of colleges will be phased out in other 15 years. The NEP aims at developing a higher education system consisting of large, multidisciplinary universities and colleges. Single stream concept from institutions will be terminated gradually and universities and colleges must aim to become multidisciplinary by 2040. The IITs are already moving in that direction. IIT-Delhi has a humanities department and set up a public policy department recently. IIT-Kharagpur has a School of Medical Science and Technology.

A National Research Foundation (NRF) will be established to fund outstanding peer-reviewed research and to actively seed research in universities and colleges. Another important move of the NEP is that foreign colleges will be permitted to open campus in India. Currently it is limited to collaborative programmes, sharing faculty, and offering distance education.

Use of technology in education will be encouraged according to NEP, online teaching and learning will be promoted. Proposals are there to set up virtual labs. E-content will be developed in various languages. *Divyang* friendly educational

software will be used to attract differently abled persons to continue study with minimum efforts. Establishment of a National Educational Technology Form (NETF) is also mentioned in the NEP.

Many of the changes as suggested in NEP is job oriented, focused on gaining practical knowledge rather than theoretical bookish knowledge. Vocational education will start in schools from the 6th grade, and will include internships.

ii. Encouraging Industry-Institution Collaborations

Interactions leading to innovation and research need to be strengthened between Industry and Institutions offering technical education. In order to encourage such interactions the following measures may be undertaken :

- Establishing industry Centres of Excellence and Incubation Cells with joint funding in institutions.

- Appointing faculty with research and industry experience, in addition to academic qualifications.

- Offering positions to selected industry experts on Boards of Studies and as adjunct faculty.

- Creating internships opportunities for learners, especially in nearby industries to develop products for local needs. Industries shall report such collaborative activities.

- Using highly advanced resources for educational purposes, particularly by sharing expensive equipment with industries or by using virtual laboratories to access resources located elsewhere.

VI. CONCLUSION

The National Education Policy aims to facilitate an inclusive, participatory and holistic approach which takes into consideration field experiences, empirical research, stakeholder feedback, as well as lessons learned from best practices. It is a progressive shift towards a more scientific approach to education. The prescribed structure will help to cater the ability of the child-stages of cognitive development as well as social and physical awareness. If implemented in its true vision and spirit, the new structure can bring India at par with the leading countries of the world.

Technical Education at all Levels is witnessing a severe competition and only those Institutions who strive for excellence will survive. The AICTE believes in providing all kinds of support and encouragement to students and Institutions to think beyond the Curriculum while imparting training for the advancement of knowledge. The AICTE has put in place several initiatives to bring about changes in the Approval Process too by introducing greater transparency and accountability through the e-governance.

This article is an attempt to provide comprehensive information on the fair and rational system of perspectives of NEP as well as other necessary information on the processes involved in qualitative changes in technical education under the guidance of AICTE.

Broadening the scope of technical education by bringing in degree and diploma programmes, bringing closer collaborations between industry and HEIs to drive innovation and research, using the technology to overcome the separation between technical education and other disciplines, planning to offer technical education in multidisciplinary education institutions and programmes, and preparing professionals in areas of greatest importance that are fast gaining prominence are just a few indications of NEP, 2020 perspectives towards fostering a technical education system in India which is on par with the best institutions in the world.

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