IMPACT OF TECHNICAL EDUCATION POLICY AMENDMENT: NEP 2020
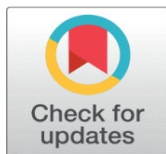
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ABSTRACT

An all-encompassing reform, the National Education Policy (NEP) 2020 seeks to revolutionize India's educational system. Development in all areas, including critical thinking and the acquisition of skills at a young age, are prioritized. NEP promotes flexibility in learning pathways, integration of arts and sciences, and technology-driven education. Its goals include encouraging research and innovation, raising awareness of the value of bilingualism, and improving the standard of education. NEP is in favor of rethinking teacher preparation programs, giving schools more freedom to operate as they see fit, and putting more emphasis on vocational education. In sum, the overarching goal of NEP 2020 is to build a school system that is both welcoming and equipped to meet the challenges of the twenty-first century. A new approach to education that emphasizes the development of well-rounded skills is promised by the National Education Policy (NEP) 2020 for technical education. Emphasizing critical thinking and creativity, it advocates for learner-centered approaches and integration of technology. NEP aims to empower students by offering flexibility in learning paths and promoting multidisciplinary education. For faculty, it offers continuous training opportunities and career advancement mechanisms. NEP also aligns vocational education with industry demands, fosters research and innovation, and enhances institutional autonomy. By addressing equity concerns and promoting international collaboration, NEP 2020 seeks to create a robust and inclusive educational ecosystem for India's future. Research in this area looks at how various players in the technical education sector have fared as a result of NEP 2020. It explores the many ways in which NEP 2020 affects Academics, Students, Faculties, Employment, Research, and Institutes, illuminating the complex effects and consequences for all of these important groups.

Keywords: National Education Policy, Policy Amendment, Education System, Technical Education

1. INTRODUCTION

In 1794, the survey school was established in Madras to educate Indian civilians to help British surveyors with land surveys and lay the groundwork for technical education. New technological institutes were established during the pre-independence era to meet the needs of the British. Since, 1794 Britishers have formed many commissions/committee which recommended various technical institutes in various parts of India for creating skilled labours, who will assist the Britisher's in achieving their ambitions and goal of ruling India. Till the end of 19th century the institutes used to train Indian personnel in carrying out maintenance of public buildings, road etc [1].

The early 20th century led to realisation of the importance of technical education which led to the foundation of the college of engineering at Jadavpur under auspices of National Council of Education. The college first offered the diploma

in mechanical engineering followed by chemical engineering. The Indian Institute of Science, which Sir Jamshedji Tata founded, also began offering electrical engineering certificate programs. Ten institutions, most of which operated out of small, substandard spaces, provided educational opportunities until the late 1930s.

The Planning and Development Department was established by the Indian government in 1944. Sir Ardeshir Dalal oversaw this department, whose mission was to restructure the Indian economy. He saw the value of higher education in boosting India's economy and believed that traditional Indian ways of living needed to alter for the country to become a global powerhouse. To achieve it he emphasised, training young persons in India in the institutions abroad. He also urged of promoting research for national benefit and survival. He felt that traditional life in India would need to change and to utilize the great opportunities created by science and technology, the services of highly qualified scientists, technologists and technicians would urgently be required.

In order to advance technical education and scientific research in India, the government took the following measures:

1) Establishment of Department of scientific and Industrial Research.
2) Forming a committee in 1945 under the chairmanship of Mr. N.R Sarkar
3) Establishment of overseas fellowship scheme for training of scientists and technologists abroad
4) Forming of All India council of technical education to advise the government in all aspects of development of technical education at diploma level and above levels, including post graduate teaching.

Maulana Abul Kalam Azad, India's first education minister, aimed to centralize government authority over the education system so that education delivery was uniform nationwide. Instead, the Union government created the University Education Commission (1948–1949) and Secondary Education Commission (1952–1953) to reform India's education system. In 1968, Indira Gandhi announced the National Policy on Education (NPE). It evaluated national training framework structure [2]. The Indian government realized that efficient planning, hard labor, and incentive are needed to build a strong economic and industrial base. India had 135 polytechnics from 1947 to 1968 [1]. Post-independence looking to economic and industrial development of country, no attention was towards developing a framework for higher studies or research in the field of engineering and technology. Later, the government realised the importance of higher education and research and its contribution towards nation's development, government founded 5 IITs with objective:

• To upgrade the knowledge and competence of teachers of technical institutions and to augment the pool of such teachers to meet the demands of future.

• To develop adequate facilities for training manpower for research and development and to provide leadership in this area.

With the above objectives the facilities for post graduate studies and Research were expanded in India.

1.1. OBJECTIVE OF EDUCATION POLICIES

Education in India is free and mandatory for all students, at least for the first few years of primary and secondary education, as stated in the country's educational policy. The nation's economy and progress rest on the strength of its technical education system. Thus the government of India is now focusing on technical education and promoting research in last few years. Looking into the first NPE i.e NPE 1968 [2], the main objective was to provide primary education to as many as possible, also to train teachers for quality education. The NPE was focused on three dialect equation i.e people should know three languages i) English ii) Hindi iii) regional dialect. NPE 1979 [2] was focused on providing basic training for the improvement of identity and character. It focused on learning of arithmetic, history, language, elementary sciences and so on.

According to NPE 2020 [3], schools should strive to help students become well-rounded people by focusing on more than simply academics. The objective is to raise morally upright individuals who can reason and act rationally; they should also have strong ethical principles and the following traits: empathy, compassion, bravery, resilience, a scientific outlook, and creative imagination. Integrating cutting-edge fields such as AI, 3-D machining, big data analysis, and machine learning into the curriculum will help students stay up with global advancements and prepare them for careers in the industry. Other subjects that will be covered include genomic studies, biotechnology, nanotechnology, and neuroscience, all of which have important implications for health, the environment, and sustainable living.

1.2. NEED OF EDUCATION POLICIES AMENDMENT

Education policies of India are aimed to provide literacy to all citizens, such that they can be self-reliable. The motive of technical education is to boost the position of India on the globe amongst the developed nations. The change in science is technology is so rapid, that to walk hand in hand with the developed nations like USA, Germany and so, India has to learn the technology and develop technology which can boost Indian economy by increasing the demand amongst the world. Thus amendments in technical education are inevitable and universities and colleges will have to adapt to it and impart that knowledge to the young technicians/technocrats.

The paper is drafted into 6 sections. Section II describes Literature Review related to Higher Education Policy. Section III discuss about the Brief Evolution of National Education Policy in India. Section IV discuss about the Degrees and Certificate Provisions in NEP 2020 For Technical Education. Section V provides an overview about Impact of NEP 2020 in fields of Technical Education. Section VI concludes the paper with the impact of NEP2020 in Technical Education.

2. LITERATURE REVIEW

Here Educational Policies and amendments of different countries and continents will be studied and explore its impact in Technical Education.

2.1. EUROPEAN HIGHER EDUCATION

The European Union considers universities to be a public good [4]. After finishing elementary and secondary school, the best pupils are invited to attend public universities for a targeted major (e.g., biology, law, engineering, business administration, etc.) after a long and competitive selection procedure. Learning "on the job" is commonplace in European universities, but students aren't prepared for the real world because their education is mostly focused on theoretical studies rather than the practical implications of what they study. Due to its selective nature, the method was effective, albeit only a tiny percentage of students were able to graduate. Colleges and universities have not been known for conducting research in the past.

The Bologna Declaration of European Union

1) The six basic principles of the Bologna Declaration [4] are –
2) The adoption of a system of easily comparable degrees;
3) The foundation of a system that runs on two primary cycles, one for undergraduates and one for graduates
4) The European Credit Transfer System (ECTS), a standardized credit system, was put into place to encourage extensive student mobility.
5) Formulating a plan to remove barriers and guarantee mobility for faculty, staff, students, and researchers
6) Fostering European cooperation to guarantee high-quality higher education by creating standardized evaluation tools

The development of the necessary European dimensions in higher education, particularly through curricular development, inter-institutional cooperation, mobility schemes and integrated programmes of study, training and research

A growing number of students from outside the European Union (EU) have enrolled in EU universities since 1999. It would appear that the Bologna Process is largely responsible for the growing acceptance of earning a degree from a European institution among international students from all over the globe, including those from the United States. Compared to the United States, Europe is seeing a greater increase in the number of international students (Brookes and Huisman, 2009). The United States saw a 17% increase in international enrolment in 2006, while the United Kingdom (UK), Germany (46%), and France (81%). The Institute of foreign Education estimates that the foreign student market contributes around $14.5 billion to the global economy each year, with the majority of this amount going toward tuition and living expenditures. This bodes well for the European economy. This is the main reason why more and more international students are choosing to study in Europe rather than the United States.

The original intent of Bologna was to expand the number of universities and diversify their courses in response to emerging trends. Flaws of EU system with American system are -

1) Students do not realise the cost of education and are not serious towards their graduation.
2) Industry academia interaction is lagging
3) Connecting instructions with research

- United States Higher Education System

In the US, students typically spend four years in college taking general education courses rather than deciding on a major after high school [4]. They can't enrol in a graduate program in a field like law, medicine, engineering, etc., until they graduate. The higher education in United States of America (USA) is very expensive as the higher education is handled by private agencies and government is not participating much in the education system. Education system in USA is more practical driven, the students are trained in a skill thoroughly, which makes them devoid of vocational skills. Consequently, American academic programs are substantially more varied than their European counterparts. Despite the fact that many American universities require students to take general education classes like art, math, religion, and history before they can begin their majors, many American universities prioritize preparing students for jobs over helping them develop their minds.

Universities often solicit funding from businesses in order to fund research, which in turn causes faculty to devote less time to teaching and more time to research, despite the fact that research is fundamental to the system. Flaws of US system with EU system are -

1) Lack of vocational training
2) Making education public
3) Developing intellectual capabilities
4) Connecting research with teaching

- Technical Education in India

The Indian government and private sector do not place a high priority on technical education. In terms of financing and university autonomy, there is no connection between the government and academia. Similarly, the industry – academia linkage is poor, technology is rapidly changing with a huge pace, in which the Indian academia has a meagre contribution. The patents filed by Indians are way less than the other countries, due to lack of funding.

The industries should approach the academia for research and development of research and to catalyse this government should come out with some policy which compels such kind of association for both industry as well as academia. Then only Indian technology will be dissipated throughout the world.

If we look at the scenario of patent filing all around the world India has filed 2053 patents which is around 1 % of global filings as per data compiled by Geneva bases World Intellectual Property Organization (WIPO) reported in financial express. This number indicates the need of encouragement to institutes as well as industries to work in this direction. Industries can come up with problems to academicians and both can collaborate in their own capacities.

- Major Amendments till 2019

Educational policy of India is mainly focused on quantifying the education rather than quality of education. Technical education was not focused earlier as it required a lot of funding. If we look at the pre independence era, technical education was provided only to fulfil the assistance for British colonial government. But post-Independence, India realised the importance of technical education in boosting the economy. Thus, various premium institutes were established like IITs to furnish the demand of technocrats in the country. Now the government has established many universities and colleges, as well government allowed private players to contribute by establishing deemed / to be deemed universities. To improve the quality of technical teachers, government has developed many programmes, where teachers are allowed to carry out doctoral studies at premium institutes of India. To boost research, government research agencies are granting research funds to carry out research which is in the direction of sustainable energy and has socio economic importance. To check the quality of technical education, government has created accreditation bodies viz.

NAAC and NBA which evaluates the institutes and programs, respectively and provides accreditation to keep the quality check of education in India.

- **A way ahead with NPE 2020**

The National Policy on Education (NPE) 2020 [5] aims to promote students' well-being throughout all levels of schooling. With this policy, we hope to raise the bar even higher in the realm of higher education. The policy talks about enhancing the student's calibre by seeking education in multidisciplinary areas rather than focussing in one area of expertise. Subjects of humanities are integral part of curricula, and students are encouraged to get vocational training, to establish a firm base for their career. The policy talks about choice-based credit system in which students can choose their subjects of their liking and study it throughout their career.

It is aimed that the short comings of Technical Education listed in the section titled "Technical Education in India" shall be overcome under the regime of NEP 2020. NPE 2020 encourages more on vocational training as well as skill development. The vocational trainings need to be backed up by the industries. This will increase institute-industry interaction, which will lead to employable technocrats/technicians. NEP 2020 also offers flexibility in choice of subjects and time frames. NEP 2020 has found overwhelming response both in academia as well as in society. It is envisaged that it will pave a new path in the field of global education.

3. A BRIEF ON EVOLUTION OF NATIONAL EDUCATION POLICY OF INDIA

Since independence in 1947, India has launched several programs to eradicate rural and urban illiteracy. The first Indian Minister of Education, Maulana Abul Kalam Azad, wanted all pupils to follow the same curriculum. To modernize education, the Union created multiple commissions. University Education Commission (1948–1949), Secondary Education Commission (1952–1953), University Grants Commission, and Kothari Commission (1964–1966). The Resolution on Scientific Policy and funding for recognized institutes of technology like the Indian Institutes of Technology were passed under Prime Minister Jawaharlal Nehru. The Union government formed the National Council of Educational Research and Training (NCERT) in 1961 as an independent institution to advise on federal and state educational policy.

The first National Policy for education was introduced in 1968 (NPE-1968) and second as NPE-1986. The third National Education Policy 2020 has come after 34 years which focuses on all round development of students, value based and skill-based education which will help build New India and Atmanirbhar bharat maturing Indian students into good global citizens.

National Policy on Education - 1968

Following the recommendations of the Kothari Commission (1964–1966), Prime Minister Indira Gandhi's administration enacted the first National Policy on Education in 1968. The strategy's stated objectives were fostering national cohesion, ensuring equal educational opportunities, and enhancing cultural and economic development through a "radical restructuring" of the educational system.

Focus Area

- The Constitution of India mandates free and compulsory education for all children up to the age of 14.
- There should be ongoing specialized training and qualification enhancement for teachers, along with ensuring academic freedom and a respected status for teachers in society.
- The policy includes the implementation of the "three-language formula" in secondary education, which involves teaching English, the official language of the respective state, and Hindi.
- There is a strong emphasis on promoting the teaching of Sanskrit, recognizing it as a vital component of India's cultural and historical heritage.
- Equal education opportunities for all be removing regional imbalances in providing educational facilities in rural and backward areas. Girls education should receive special emphasis.
- Community service and national reconstruction.
- Science education and research, particularly in the fields of agriculture and industry, are given high priority.
- Production of high quality textbooks for school and university.

- Opportunity for secondary education and increase facility for technical and vocational education.
- University education based on available resources.
- Development of part time education and correspondence courses in university level.
- Promotion of literacy and adult education.
- Uniform education structure in the pattern of 10+2+3.
- Increasing education spending to six percent of the national income.

Advantages

- Ensured compulsory education for all starting from childhood in rural and backward areas.
- Enhanced training and qualification of teachers ensured quality education. Stress on academic freedom of teachers to purse and publish independent studies and research.
- Language education was considered crucial to bridge the gap between the intellectual elite and the general population.
- The promotion and learning of Hindi were encouraged to foster a common language for all Indians.
- Raising the investment in education 6 per cent of the national income will ensure development in education.

Limitations

The decision to adopt Hindi as the national language sparked controversy and faced resistance from certain regions of India.

3.2. LIMITED EMPHASIS ON UNIVERSITY EDUCATION.

National Policy on Education 1986

The new National Policy on Education, instituted in 1986 by the Rajiv Gandhi administration, focused on improving educational opportunities for women and members of Scheduled Tribes (ST) and Scheduled Castes (SC) populations in India. The declared purpose of the policy was to ensure that all populations had equal access to quality education and to eradicate educational disparities.

During P. V. Narasimha Rao's presidency in 1992, the National Policy on Education, which had been in place since 1986, was amended. In 2005, it was included in the Common Minimum Program, which was spearheaded by Prime Minister Manmohan Singh. Several crucial areas were the focus of the 1992 Programme of Action (PoA), which was a component of the National Policy on Education (NPE) beginning in 1986:

- Expansion of scholarships
- Promotion of adult education
- Recruitment of more teachers from the SC and ST communities
- Incentives for economically disadvantaged families to ensure regular school attendance of their children
- Development of new educational institutions
- Provision of housing and services

The program in 1986 initiated "Operation Blackboard" to enhance primary schools nationwide and prioritized a "child-cantered approach" to instructing young students. As part of its efforts to broaden access to higher education, the plan also assisted in the 1985 establishment of the Indira Gandhi National Open University. More than that, it helped fund rural universities that were modeled after those of Mahatma Gandhi, with the goal of fostering economic and social growth at the grassroots level in rural India.

The policy set a target of allocating 6% of the GDP for education.

1992 Modified Policy

A standardized entrance exam for all of India's technical and professional degree programs was to be administered in 1992 as part of the revised policy. As part of a Three-Exam Scheme, the government instituted the Joint Entrance Examination (JE) and the All India Engineering Entrance Examination (AIEEE) for entry into national-level engineering

and architecture/planning programs, as well as the State Level Engineering Entrance Examination (SLEEE) for state-level institutions, with the option to enroll in AIEEE.

Advantages of these initiatives included standardizing admission procedures and maintaining professional standards while reducing the burden on students and parents associated with multiple entrance examinations.

However, the policies had certain limitations:

They did not address the condition of schools operating on commercial lines throughout the country.

Measures to bridge the educational disparities between underprivileged children and those from more privileged backgrounds were lacking.

Admission based solely on capability might exclude many youths from accessing university education.

The effectiveness of open universities as a substitute for regular universities was uncertain.

• Recommendations for technical institutions to implement capitation fees could put worthy students out of reach financially, preventing them from pursuing technical education.

National Education Policy 2020

In 2019, the Ministry of Human Resource Development released a Draft New Education Policy 2019, which was followed by a number of public consultations. On 29th July 2020, the cabinet approved a new National Education Policy with an aim to introduce several changes to the existing Indian education system.

Focus Area

Introduction of "5+3+3+4" design that covers children in the age group between 3 and 18 years. The new structure is as follows:

PRE-PRIMARY: There is a five-year preparatory phase. Three of those years are spent in elementary school, while the other two are split between first and second grade.

LATER PRIMARY: There will be three years of getting ready. Classes 3, 4, and 5 comprise these.

UPPER PRIMARY: The middle stage lasts for three years. Those are the sixth, seventh, and eighth grades.

SECONDARY: This stage includes Higher Level. They are Grades 9, 10, 11 and 12.

A four-year integrated Bachelor of Education degree is the bare minimum for teaching positions. This is scheduled to be implemented by the year 2030. In addition, educators will receive professional development in the form of online courses. Methods applicable to the Indian context will be the primary emphasis of the course. This will contribute to closing the digital gap.

Points relevant to School Education

o Up until the fifth grade, it is required to teach in the child's native language. The goal is to ensure that all children have access to pre-primary education by the year 2025. Children between the ages of three and six are considered to be in the pre-primary age bracket. Its other stated goal is the universalization of elementary and secondary education by the year 2030. Additionally, the Gross Enrollment Ratio of Secondary level is targeted to reach 100% by the year 2030.

New curriculum at preschool and Anganwadi.

The students will be allowed to take the exams twice. The exams will test core competencies rather than memorizing facts.

Points relevant to Higher Education

It will be the goal of every college to eventually become a university or other independent institution that grants degrees.

The goal is to raise the Gross Enrollment Ratio (GER) for higher education, which includes vocational education, from 26.3% in 2018 to 50% by 2035.

The General Education Council, the National Higher Education Regulatory Council, the Higher Education Grants Council, and the National Accreditation Council will all work together under the new Higher Education Commission of India (HECI), which will serve as an overarching body for higher education in India.

Single-stream higher education institutions will transition to multidisciplinary institutions over time, with colleges gradually gaining autonomy over a 15-year period.

The policy promotes interdisciplinary learning, allowing students to choose subjects across various streams without rigid separations.

Undergraduate degrees will have flexible durations of 3 or 4 years, with multiple exit options along the way (certificate after 1 year, diploma after 2 years, or Bachelor's degree after 3 years). The policy eliminates the M.Phil degree.

An Academic Bank of Credit will be established to digitally store academic credits earned from different institutions for transfer and accumulation towards degrees.

The regulation of higher education will be "light but tight," overseen by a single regulatory authority to enhance access, equity, and inclusion.

By 2040, higher education institutions aim to become multidisciplinary, each accommodating at least 3,000 students, with large multidisciplinary institutions planned for each district by 2030.

Universities will focus on holistic education, offering quality teaching, research, and community engagement, with a spectrum of institutions ranging from research-intensive to teaching-intensive universities.

High-performing Indian universities will be encouraged to establish campuses abroad, and top global universities will be supported to operate in India.

Vocational education will be integrated into all schools and higher education institutions progressively, aiming for 50% learner exposure by 2025.

Efforts will incentivize the academic merit of students from marginalized communities.

India will be promoted as a global study destination, offering premium education at affordable costs, with dedicated International Students Offices at host institutions.

A robust research culture in universities will be fostered by the establishment of a National Research Foundation (NRF).

In order to maintain and advance linguistic variety and translation studies, two new institutes will be founded: one in India and one at the national level.

Advantages

Undergraduate programs will now last three or four years and offer many ways out within that time. A certificate, diploma, or Bachelor's degree will be awarded by colleges after one year of study in any subject or field (including vocational and professional sectors), two years of study, and three years of study, respectively.

The goal of the new policy is to raise the Gross Enrollment Ratio (GER) in all types of higher education from 26.3% in 2018 to 50% by 2035. This includes vocational education. In order to accommodate this, universities will be allocated an additional 35 million seats.

In order to stimulate and accelerate research and innovation in all academic fields, especially at the college and university levels, the government will establish a National Research Foundation (NRF).

A common college entrance exam, similar to the SAT, will be administered twice yearly by the National Testing Agency (NTA).

The authority to grant degrees will be gradually increased to colleges over the course of the following fifteen years. Universities will no longer be officially recognized, although these schools will be considered equivalent to universities.

A limit on fees charged by private institutions in the higher education sector is proposed by the new policy.

India will make it easier for highly regarded universities from around the world to visit. It is also planned to encourage top Indian institutions to expand internationally.

The Master of Philosophy program would be eliminated, allowing master's degree holders to pursue doctoral degrees.

4. LIMITATIONS

The new educational policy is going to widen the gap between different parts of society even more. Students at private schools will begin learning English in the first grade, while those in public schools will learn their native tongue. Students who struggle with the English language will grow in number since they will start learning the language seven years later than their private school counterparts.

The new system mandates a four-year course of study for graduation. Can the student earn the diploma in two years? If so, will they continue with the program? Even if he or she dropped out of the program in the middle of the second year, that's still two years of excellent professional experience.

Developing study materials in mother tongues and finding qualified teachers fluent in many languages might be challenges when incorporating mother languages into academic institutions for each discipline.

5. DEGREES AND CERTIFICATE PROVISIONS IN NEP 2020 FOR TECHNICAL EDUCATION

The NEP 2020 suggests to specify well defined pathway for the students receiving vocational education or to offer competency certificate to students who drop the education. The National Vocational Education Qualification Frame Work (NVEQF) proposed in 2012 specifies various competencies certificate level corresponding to conventional degree being offered by university. The proposed frame work provides entry qualification, and duration for the degree offered in technical education. It also provides the competency certificate to be given to students who drop the program at various stages. However, it is not possible to offer competency certificate if university follows the present curriculum. Therefore, it is also recommended to implement Choice Based Credit System (CBCS) and Academic Credit Bank (ACB) as proposed in NEP 2020. For example if student drops after 1st year in undergraduate (B.E. / B.Tech) program in mining; he may not have studied discipline specific courses in first year of engineering to offer any competency certificate. Therefore, the CBCS curriculum provides opportunity to student to opt for the courses to be eligible to receive minimum credit requirements to receive competency certificate. In case of diploma or undergraduate program in mining few competency areas as given below may be considered and certificate may be offered.

- Mining Processes
- Underground Mining
- Surface Mining
- Mining Geo-mechanics
- Metal Extraction Process
- Drilling and Blasting
- Sustainability and Environment
- Mineral Processing and Unit Operation

The university needs to prepare the CBCS based curriculum offering number of elective courses in specified competency areas such that student takes courses in a competency area of his interest. The credits earned by students from the courses are deposited in Academic Credit Bank (ACB). The National Competency Certificate at appropriate level can be offered based on the credits earned by students and deposited in ACB.

The table given below presents the level of certificate may be given to students if he/she drops the program before it stipulated time and credits earned.

Table 1: Degree and Certificate Provisions

Course	Qualification (Entry)	Duration	Major Reforms		Remarks
			NVEQF Equivalent	**Certifying body**	
Diploma	10th Standard OR Equivalent	3 years (After 3 years student receives Diploma in selected specialization)	NCC – 1 (After 1 year drop) NCC – 2 (After 2 year drop) NCC – 3 Equivalent to Diploma	Technological University or Technical Education Board or Sector Skill Council	• At the time of drop out student may need to take few courses related to competency certificate area having credits equivalent to 1st year diploma courses. For example, to avail NCC in Underground Mining courses related to underground mining may be opted. (level-1 requires total 980 hours of course work, level-2 requires 1030 hours, and level-3 requires 1040 hours of course work • NCC-3 requires total number of credits which are equivalent to total credits required for diploma.
					Note: Choice Based Credit System must be implemented so that student may select particular competency related courses to attain competency certificate is interested (As per NEP 2020 [3]) **Note:** The Academic Credit Bank must be implemented in which students can deposit the earned credits and attain certificate based on credit earned in particular competency (As per NEP 2020 [3])
Degree (B.E.)	Diploma, 12th, NCC-3	4 years (B.E.)	NCC – 4 (After 2 year drop) NCC – 5 (After 3 year drop) equivalent to Advance Diploma (Note equivalent to B.E. degree)	Technological University	
Integrated M.E.	Diploma, 12th, NCC-3	5 Years At the end of 5th year student	If dropped after 4 years then student receives B.E. Degree		Last year must be for research activities

		receives M.E. degree			
M.E./ M.Tech	B.E./B.Tech	2 years At the end of 2nd year student receives M.E. degree	After 1st year drop NCC-6 or Post Graduate Diploma		

National Vocational Education Qualification Framework (NVEQF) - 2012 NCC: National Competency Certificate

6. IMPACT OF NEP 2020 IN FIELDS OF TECHNICAL EDUCATION

Impact of NEP 2020 in fields of Technical Education in the following areas are discussed in this section -
1) Academics
2) Students
3) Faculties
4) Employment
5) Research
6) Institute

6.1. IMPACT ON ACADEMIC UNDER NEP 2020 IN TECHNICAL EDUCATION

1) The focus in education should shift from rote memorization of facts to cultivating students' capacity for critical thinking, analysis, and problem solving. The result should be a student who is more able to think creatively, innovatively, adaptively, and across disciplines. Education should strive to be more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centered, discussion-based, adaptable, profitable, rewarding, and pleasant through the pedagogy.

2) The National Educational Technology Forum will be established as an independent entity to facilitate the free flow of ideas regarding the integration of technology into the planning, learning, assessment, and administration processes.

3) Thoroughly planned and adequately scaled pilot studies are necessary for weighing the benefits and drawbacks.

4) The concerns of equity must be adequately addressed by the use of technology for online and digital education.

5) Continuing and improving digital platforms and educational initiatives that utilize information and communication technologies is crucial in order to meet the current and future demands of providing quality education to everyone.

6.2. IMPACT ON STUDENTS UNDER NEP 2020 IN TECHNICAL EDUCATION

1) Recognizing, identifying, and nurturing the unique capabilities of each student by sensitizing teachers and parents to promote holistic development in academic and non-academic aspects.

2) Incorporating flexibility into the learning process to empower learners in choosing their educational paths based on their talents and interests.

3) Eliminating rigid separations between arts and sciences, curricular and extra-curricular activities, and vocational and academic streams to break down hierarchies and integrate different areas of learning.

4) Providing multidisciplinary and holistic education to uphold the unity and integrity of all knowledge.

5) Prioritizing conceptual understanding over rote learning and exam-centric education.

6) Admission process will be relaxed for the students because of implementation of one common entrance exam with the option to choose subjects under UG admission.

7) Most of the students from shall have an exposure to vocational courses.

8) Increase in focus on the skill development and competency development of students

9) Make students future ready by building 21 century skills

10) Make students focus on both academic and non-academic pursuits

11) Mid-term drop students will be able to complete after break

6.3. IMPACT ON FACULTIES UNDER NEP 2020 IN TECHNICAL EDUCATION

1) A good teacher in a traditional classroom may not be that effective teacher in an online classroom. So, to be

2) effective online educators' teachers require suitable training and development.

3) Through the use of technical platforms like DIKSHA, SWAYAM etc. the faculties will have continuous learning opportunities, continuous training opportunities and minimal career gap while pursuing their careers.

4) Faculty can advance the career opportunities through operationalization of career-progression mechanism, professional development opportunities and improved structures of incentives.

5) Vast opportunities for faculties through enhanced scholarships

6) Introduction of professional teaching standards

7) Clearer outlined roles and responsibilities

8) Training to monitor and improve their capabilities.

6.4. IMPACT ON EMPLOYMENT UNDER NEP 2020 IN TECHNICAL EDUCATION

Market orientation of vocational education will be increased as NEP focuses to develop industry-linkages and demand-driven vocational courses keeping in centre the expectations of the industry.

6.5. IMPACT ON RESEARCH UNDER NEP 2020 IN TECHNICAL EDUCATION

1) Encouraging creative and critical thinking to foster logical decision-making and innovation.

2) Promoting multilingualism and leveraging the power of language in educational instruction and learning.

3) Emphasizing regular formative assessments focused on learning progress, moving away from the prevalent 'coaching culture' associated with summative assessments.

4) Leveraging technology extensively in teaching and learning to break language barriers, enhance accessibility for students with disabilities, and improve educational planning and management.

5) Implementing a 'light but tight' regulatory framework to ensure integrity, transparency, and resource efficiency within the educational system through audits and public disclosure, while also encouraging innovation through autonomy, good governance, and empowerment.

6.6. IMPACT ON INSTITUTE UNDER NEP 2020 IN TECHNICAL EDUCATION

1) Gradual phase out of affiliating college system to establish greater institutional autonomy through independent Board of Governance (BoG).

2) Suggestion to implement a BoG, as a single regulatory body, consisting of highly qualified and competent individuals will definitely work to improve efficiency of governance.

3) Fabulous resource sharing and outcome monitoring will be achieved through reformation and stabilization of the institutes which will have a major impact on the magnitude of the institutions by downsizing them to nearly one-third. It will result in less fragmented educational institutions in the country.

4) Improved Budgetary efficiency, which can be directed towards enhancing educational outcomes.

5) Multi-disciplinary education will focus on quality education in diversified streams.

6) International academia will be attracted to participate in the Indian Educational System because of the International reforms proposed by NEP 2020 which will result in the integration of global skills in Indian curricula thereby creating an International Education ecosystem in India for Indian students and faculties.

7) Open Distance Learning (ODL) will create opportunities for expanding and increasing enrollments, online programmes and branch campuses in other countries.

8) Better mobilization opportunities will open up for ITIs and Diploma institutes to collaborate and merger with secondary schools which will help address issues related to awareness and perception.

7. CONCLUSION

The implementation of the National Education Policy (NEP) 2020 in technical education is poised to bring about significant transformations across various stakeholders. From a pedagogical perspective, there's a shift towards fostering critical thinking, creativity, and problem-solving skills, alongside leveraging technology for a more experiential and learner-centric approach. The establishment of the National Educational Technology Forum underscores the commitment to embracing technology for educational enhancement while ensuring equity and inclusivity in digital education. For students, the NEP emphasizes recognizing and nurturing individual talents, offering flexibility in learning pathways, and integrating disciplinary boundaries to promote holistic development. By prioritizing conceptual understanding over rote learning and streamlining admission processes, the policy aims to make education more accessible and relevant to diverse learner needs. Faculty members stand to benefit from continuous learning opportunities, career progression mechanisms, and professional standards, enabling them to adapt to evolving educational landscapes and enhance their teaching capabilities. The emphasis on research encourages critical thinking and innovation, while multilingualism and technology integration facilitate inclusive and effective learning environments. Institutes are expected to undergo structural reforms towards greater autonomy, efficiency, and international collaboration, leading to improved educational outcomes and resource utilization. The phased transition from affiliating colleges to independent governance boards and the consolidation of institutions aim to streamline administration and enhance educational quality. Overall, the NEP 2020 in technical education signals a paradigm shift towards a more dynamic, inclusive, and globally competitive educational ecosystem, poised to equip learners and educators alike with the skills and opportunities necessary for success in the 21st century.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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