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# Challenges before standalone UG Engineering Institution in Implementation of NEP 2020

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**ABSTRACT —**The National Education Policy (NEP) 2020 is a major policy reform in the Indian education sector. It aims to transform the education system to make it more relevant, equitable, and inclusive. The NEP has several provisions that are relevant to stand-alone undergraduate engineering institutions (UGIs). However, there are also some challenges that these institutions will face in implementing the NEP. NEP 2020 is a new initiative and not much research has been undertaken on this policy. This gives opportunity for research so as to understand the difficulties the HEI especially UG engineering institutions are likely to face in the process of implementation of the new policy. Institutions in India can be Universities (State, State Private, deemed to be Universities), Institutions (Autonomous or Affiliated and Standalone). To understand the various bottlenecks in implementation process brainstorming was undertaken with managements and Principals of few institutions came up with their opinions. The various pillars of NEP were discussed so that all understand the NEP requirements in detail. The inputs from stakeholders on the major points were included and recorded on a google form which was distributed randomly in various social media groups to solicit their opinion. The respondents were from various states of the nation, had a varied experience ranging from 17 years to 42 years and occupied various positions from Associate Professor to Professor, Dean, Vice Principal and Principal. The inferences drawn indicate that over 57% of the respondent's institutions have not gone for NAAC accreditation, and they were aware of the various initiatives of the nation viz. National Research Foundation and National Credit Framework. As it's too early to decide 71% of the respondents have not taken a call on the type of university they wish to become in coming years (Unitary or Cluster university) but 50 % of respondents have shown interest to be a research-intensive university with 35% being focused on Teaching intensive university. Majority of the institutions represented were offering single program (60%) and only 40% of institutions were offering more than one program. Majority of the respondents plan to introduce technical programs in coming years, followed by humanities program to make the institution multi-disciplinary. The data reveals that as of now the institutions do not have scope for future expansion and need to invest in additional built-up area to cater to new programs.

**Keywords—**NEP 2020, Implementation Challenges, Educational Policy, Engineering Education

## I. INTRODUCTION

The NEP 2020 is a major policy reform policy introduced in India with the aim of transforming the country's education system in the Indian education sector. It aims to transform the education system to make it more relevant, equitable, and inclusive. The NEP

has several provisions that are relevant to stand-alone UGIs. However, NEP 2020 encompasses various levels of education, including engineering education, and sets out to bring about significant changes to improve the quality, relevance, and inclusivity of education in the country.

NEP 2020 holds particular significance for engineering education as it seeks to address the challenges and gaps in the current engineering curriculum and pedagogy. The policy emphasizes a multidisciplinary approach, hands-on learning, and the integration of industry-relevant skills to ensure that engineering graduates are well-equipped for the dynamic demands of the modern world.

Understanding the challenges specific to standalone UG engineering institutions is crucial as they play a significant role in engineering education across the country. By identifying and addressing these challenges, policymakers, administrators, and stakeholders can better support these institutions in effectively implementing the reforms outlined in NEP 2020.

The purpose of this paper is to examine the challenges faced by standalone undergraduate (UG) engineering institutions in implementing NEP 2020. Standalone UG engineering institutions refer to engineering colleges or institutions that are not affiliated with larger universities but operate independently. These institutions often have their own unique set of circumstances, constraints, and resources. This paper aims to shed light on the specific challenges faced by standalone UG engineering institutions and provide insights and recommendations to address these challenges. By doing so, the paper seeks to contribute to the existing body of knowledge on the implementation of NEP 2020 in the context of engineering education, and ultimately, facilitate the successful transformation of standalone UG engineering institutions in alignment with the goals of NEP 2020.

## II. LITERATURE REVIEW

Maharashtra Govt in 2023-2024 has initiated Implementation of NEP 2020 for UG Courses (Non-Professional) and has plans to implement the same in professional institutions by 2024-25 (144 Institutions in Maharashtra to Start NEP Implementation This Yr: Patil, n.d.).

The NEP 2020 curriculum framework offers

i. The flexibility to move from one discipline of study to another;

ii. The opportunity for learners to choose the courses of their interest in all disciplines;

iii. The multiple entry and exit options with the award of UG certificate/ UG diploma/ or three-year degree depending upon the number of credits secured;

iv. The flexibility for learners to move from one institution to another to enable them to have multi and/or interdisciplinary learning;

v. The flexibility to switch to alternative modes of learning (offline, ODL, and Online learning, and hybrid modes of learning).

## III. NATIONAL EDUCATION POLICY 2020:

The NEP 2020 is a comprehensive policy framework for the development of education in India (Kalyani, 2020). It was approved by the Government of India in July 2020 and aims to bring about transformative changes across all levels of education, from school to higher education. Here are the key highlights and objectives of the NEP 2020:

1. Holistic and Multidisciplinary Education: The NEP 2020 promotes a holistic and multidisciplinary approach to education, emphasizing the integration of various disciplines and skills. It aims to develop well-rounded individuals with a broad knowledge base, critical thinking abilities, and creativity.

2. Universalization of Early Childhood Care and Education: The policy emphasizes the importance of early childhood care and education, aiming to provide quality early childhood education for children in the age group of 3 to 6 years. It recognizes the crucial role of foundational education in a child's development (Siraj-Blatchford et al., 2008) .

3. Foundational Literacy and Numeracy: The NEP 2020 places significant emphasis on foundational literacy and numeracy skills. It aims to ensure that every child achieves basic proficiency in reading, writing, and mathematics by Grade 3.

4. Flexibility in Choice of Subjects: The policy provides flexibility in choosing subjects and promotes a multidisciplinary approach at the secondary level. It enables students to select subjects based on their interests and aptitudes, fostering a holistic development and facilitating a seamless transition to higher education (A Strong Focus on Vocational Education in NEP 2020, n.d.; Markowitsch & Hefler, 2019).

5. Technology Integration: The NEP 2020 recognizes the importance of technology in education and promotes its effective integration. It aims to leverage technology for improving teaching and learning processes, online education, and the development of digital infrastructure.

6. Vocational Education and Skill Development: The policy emphasizes the integration of vocational education and skill development into the mainstream curriculum. It aims to provide students with practical skills and experiences that enhance their employability and entrepreneurship capabilities.

7. Teacher Training and Professional Development: The NEP 2020 focuses on the continuous professional development of teachers, enhancing their skills and competencies. It emphasizes the use of technology for teacher training and encourages the establishment of dedicated teacher education institutions (Need for Compulsory Teacher Education Courses for Higher Education Faculty for Effective Implementation of NEP 2020 - ProQuest, n.d.).

8. Higher Education Reforms: The policy envisions significant reforms in higher education, including a flexible and multidisciplinary approach, the establishment of a National Research Foundation, promotion of research and innovation, and the internationalization of higher education (Gupta et al., 2021).

9. Promotion of Indian Languages: The NEP 2020 emphasizes the promotion and preservation of Indian languages, recognizing the importance of linguistic diversity and multilingualism in education. It encourages the teaching and learning of local languages alongside regional and international languages (Aithal & Aithal, 2020).

10. Regulatory Framework: The policy proposes the establishment of a single overarching regulatory body for higher education, called the Higher Education Commission of India (HECI), to replace existing regulatory bodies. It aims to streamline and strengthen the regulatory framework for higher education.

The NEP 2020 aims to transform the education system in India, making it more inclusive, flexible, and relevant to the needs of the 21st century. It seeks to promote quality education, innovation, and research, preparing students to meet the challenges of a rapidly changing world.

## IV. METHODOLOGY

To understand the various bottlenecks in implementation process brainstorming was undertaken with managements and Principals of few institutions came up with their opinions. The various pillars of NEP 2020 were discussed so that all understand the NEP requirements in detail. The inputs from stakeholders on the major points were included and a google form was created compiling all the 62 questions under the eight different sections. The sections included Multi-disciplinary approach, Flexibility and CBCS, Skill Development, Research & innovation, Faculty development and continuous learning, Industry academia collaboration and use of technology. This google form was distributed randomly in various social media groups of the authors to solicit their opinion. The respondents were from various states of the nation, had a varied experience ranging from 17 years to 42 years and occupied various positions from Associate Professor to Professor, Dean, Vice Principal, Principal and Controller of Examination. The analysis of the results are being discussed in the results and discussion column below.

## V. RESULTS AND DISCUSSION

The respondents were from various states of the nation, had a varied experience ranging from 17 years to 42 years and occupied various positions from Associate Professor to Professor, Dean, Vice Principal and Principal and are from affiliated, autonomous institutions, State Public University, State Private University and deemed to be University with 80% of them being Doctorates. The respondents belonged majorly from the southern states of Maharashtra, Karnataka, Telangana, Tamilnadu and few from Delhi and Jammu and Kashmir.

The inferences drawn indicate that over 57% of the respondent's institutions have not gone for NAAC accreditation, and they were aware of the various initiatives of the nation viz. National Research Foundation and National Credit Framework. As it's too early to decide 71% of the respondents have not taken a call on the type of university they wish to become in coming years (Unitary or Cluster university) but 50 % of respondents have shown interest to be a research intensive university with 37.5% being focused on Teaching intensive university.

**Multidisciplinary Approach**: NEP 2020 encourages a multidisciplinary approach to education, including engineering programs. It emphasizes the integration of different disciplines and the development of well-rounded individuals with a broad knowledge base. Standalone UG engineering institutions can leverage this aspect to offer interdisciplinary courses, allowing students to explore diverse fields and develop a comprehensive understanding of the interconnected nature of knowledge.

Majority of the institutions represented were offering single program (57%) and only 43% of institutions were offering more than one program. To be multi-disciplinary the institutions plan to add Management Program (25%) but half of the institutions wish to open up new Technical programs like BE, B.Tech. and 41% have opted for humanities. These programs shall be regulated by AICTE, PCI and mostly affiliated to the universities. To offer new programs nearly 70% of institutions need added built up space with new class rooms, ICT facilities and laboratories. Due to the varied nature of programs the respondents are not very convinced about the economic viability of the new programs they will be offering in due course of time.

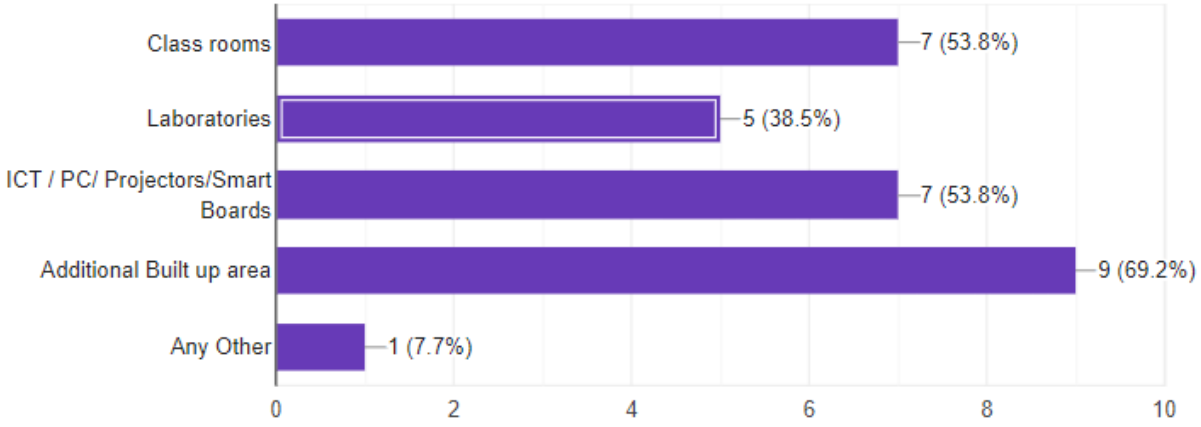


Figure 1 Need for infrastructure to start new programs by institutions

**Flexibility and Choice-based Credit System:** NEP 2020 promotes flexibility in curriculum design and the adoption of a choice-based credit system. Standalone UG engineering institutions can benefit from this by offering a more flexible range of courses, allowing students to customize their learning based on their interests and career goals. This facilitates a broader education experience and encourages students to pursue subjects beyond the core engineering disciplines.

Over 87% of the respondent's institutions are offering CBCS ie Choice Based Credit System as mandated by UGC and mostly the institutions responded were engineering institution with few being from the commerce and management streams. CBCS is being offered right from 2015 and institutions have over the years switched to CBCS. As a part of CBCS open electives are being offered by 72% of the institutions and the total credits for the elective subjects is ranging from 6 to 15 credits. Many institutions in line of NEP 2020 have already stated offering minor/major program and honors program.

**Emphasis on Skill Development**: NEP 2020 recognizes the importance of skill development alongside academic learning. Standalone UG engineering institutions can align their programs with the skill development initiatives outlined in NEP 2020, focusing on practical training, industry collaborations, and the development of transferable skills such as communication, problem-solving, and teamwork. This prepares students to be job-ready and adaptable in a rapidly evolving professional landscape.

All the institutions have introduced skill training to their students clearly highlights the importance of NEP and the future holds for skilled professionals.

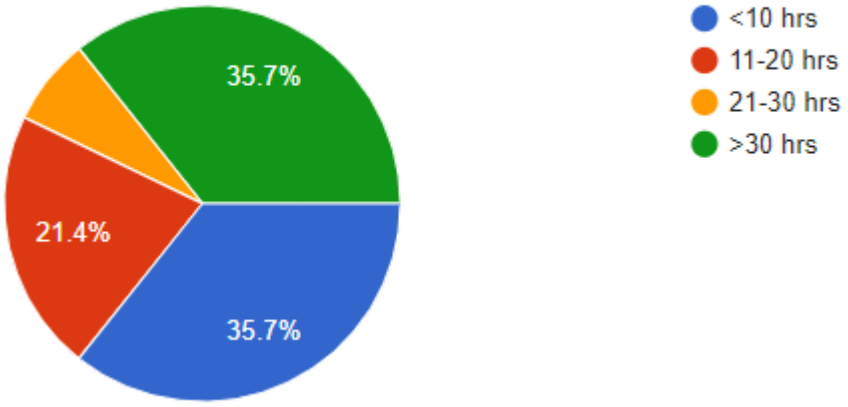


Figure 2 No. of hours of skill training provided to students

The skill training provided is mainly in the technology domain@80% related to IT fields and are long duration training program of over 30 hours' duration. Ability Enhancement Courses AEC are being offered as they have been incorporated in the curriculum but still about a third of institutions are yet to offer the same for want of guidelines from the universities. The awareness on Indian Knowledge System (IKS) is growing /catching up and it shall be wide spread in years to follow.

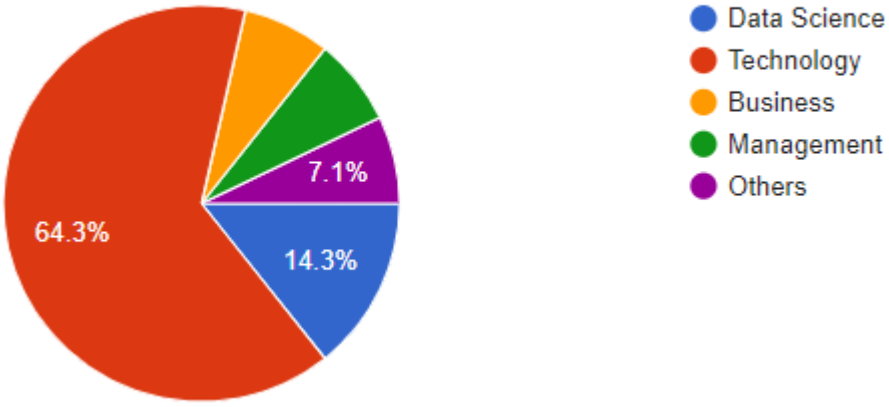


Figure 3 Skill Training Domains

**Research and Innovation:** NEP 2020 emphasizes the promotion of research and innovation in higher education, including engineering. Standalone UG engineering institutions can create a conducive environment for research and innovation by encouraging faculty and students to undertake research projects, collaborate with industries, and engage in entrepreneurial activities. This fosters a culture of innovation, contributes to knowledge creation, and enhances the quality of engineering education.

Majority of the institutions have already brainstormed and come out with a well-documented research policy and are providing financial support to teachers and students to

undertake research and publish their findings. Institutions have initiated various measures to further research and IPR activities by entering into collaborations (MoUs), providing training and development, sponsoring faculty members for doctoral program and even incentivizing research and subsequent publication.

**Faculty Development and Continuous Learning**: NEP 2020 emphasizes the importance of faculty development and continuous learning. Standalone UG engineering institutions can invest in faculty training programs, workshops, and collaborations with other institutions to enhance the teaching and research capabilities of their faculty members. This ensures the delivery of high-quality education and promotes a vibrant academic community.

As observed in the case of research, the institutions have drafted clear and written policies for encouraging faculty members to attend conferences, FDPs, STTPs and workshops organized by various other institutions within or outside their respective states. Various measures of support are extended be it through non-financial support (granting duty leaves to cover their absence from work) financial support (covering part or the entire cost involved) or even both. Hence the institutions are encouraging the faculty members to take up SWAYAM courses many of them being recognized as FDP by AICTE/UGC.

**Industry-Academia Collaboration:** NEP 2020 encourages closer collaboration between academia and industry. Standalone UG engineering institutions can establish stronger ties with industries, enabling students to gain practical exposure through internships, industry projects, and guest lectures. This enhances the relevance of engineering education, bridges the gap between academia and the industry, and enhances students' employability.

Institutions lately have opened up to their interactions with the industries and over 80 % of respondents have claimed that their institutions have a functional IIIC. The institutions duly recognizing the importance of industry and its personnel have appointed them on their Board of Studies/ Departmental Advisory Boards and PAQIC Program assessment and Quality Assurance Cell.

**Use of Technology**: NEP 2020 promotes the integration of technology in education. Standalone UG engineering institutions can leverage technological tools and platforms to enhance teaching methodologies, facilitate online learning, and create virtual labs for practical training. This ensures that students have access to the latest tools and resources, preparing them for the technologically-driven engineering landscape.

Over half of the institutions have set up virtual labs for the benefit of the students. Over 1/3 of them have shown keenness to collaborate with IIT Bombay for the V Lab project (Nodal Centre). The awareness of IIT Spoken Tutorial is on the rise to learn about the new technologies in emerging areas. Digital recording studio to encourage online learning (blended learning) is being established by the intuitions. Similarly, procurement of smart boards/ interactive panels is being undertaken and the teaching content is also being developed. The UGC Regulations, 2021 permit up to 40% of the total courses being offered in a particular programme in a semester through the Online Learning Courses offered through the SWAYAM platform and/or other State Level Common Platforms which can be developed in due course with the participation of different Universities/ HEIs.

The various courses being planned to be implemented by the institution include E&C courses, design thinking, AI/ML, Ability Enhancement courses, open electives as the

affiliating universities are following the guidelines of UGC and are encouraging OEC in curriculum as a part of implementing OBE.

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