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Higher Education Institutions and Technology Enabled Learning in Light of NEP 2020

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Abstract: The human society is undergoing a massive change in the knowledge landscape. The National Education Policy 2020 has been approved with a vision to revitalize the Indian Education system in tune with the rapid changes of technological advancements in society. The NEP 2020 has aptly recognized the importance of technology in education and brought the Digital India Campaign into the education domain as well. The present paper attempts to discuss the recommendations of NEP-2020 regarding the use and integration of technology in higher education to meet the emerging needs of the knowledge society and knowledge-based global economy in the context of teaching learning paradigm. Furthermore the digital initiatives of the Government for promoting Technology Enabled Learning (TEL) in Higher Education Institutions (HEIs), has been given much importance. The paper aims to evaluate NEP-2020 to interrelate relevance and excellence in Indian Higher Education by analyzing the role of National Educational Technology Forum (NETF) in shaping the future higher education in the country.

Key Words - National Education Policy 2020 (NEP2020), Technology Enabled Learning (TEL), Higher Education Institutions (HEIs), NationalEducational Technology Forum (NETF)

INTRODUCTION

Human society is constantly growing and changing in terms of enhancing and fortifying its resources and directing their prudent use towards enhancing the quality of life. Knowledge and information have long been the cornerstones of human society's quest for advancement and prosperity in all areas of life. A thorough examination of the profound shifts brought about by the Industrial Revolution since the middle of the eighteenth century shows that the advancement and prosperity of the economy and society are linked to the extraordinary and swift acceleration of knowledge creation and management. A nation's ability to harness and

produce knowledge capital defines its ability to empower its people and enable them to use their skills to the fullest for the social and economic development of the nation. Since knowledge is the primary driving forces of progress, it is necessary for a nation to modernize its educational system in order to promote the acquisition of critical skills that will enable it to keep up with advances in science, technology, and the economy. The implementation of technology in all educational levels through the New Education Policy-2020 is a commendable step towards upgrading and updating the Indian educational framework. This will strengthen the knowledge management system by expanding access to educational resources, creating relevant learning experiences, and enhancing student-centered learning.

In this era of unprecedented technological advancements, the success of economy and society are now directly linked with the development of knowledge. Eminent scholars like Peter Drucker and Alvin Toffler discussed deliberately at length the future of the developed and developing countries will be defined by the exploitation of knowledge and information. To quote Peter Drucker "Since ancient times, new knowledge and new inventions have periodically remade human societies. Today, however, knowledge is assuming greater importance than ever before; now more essential to the wealth of nations than either capital or labor" The innovation, creation and dissemination of knowledge have become a deciding factor for transformation of the self, the society and the economy. At present the human society is moving ahead to accommodate the fourth industrial revolution which is defined briefly as the vital interaction between human and machines in the form of Artificial Intelligence. In this fourth phase of Industrial revolution, the Industrial Revolution (IR) 4.0 technology is predicted to deeply affect the 2030 Sustainable Development Goals such as good health, clean water and sanitation, clean energy, sustainable cities, climate action. The upshot of IR 4.0 Technologies in the academic corridors is termed as Educational Revolution 4.0 as explained by Anthony Seldon in his book, The *Education Revolution: Will Artificial Intelligence Liberate or Infantilize Humanity*.

OBJECTIVES:

- To discuss the recommendations of NEP-2020 regarding the use and integration of technology in higher education.
- Analyzing the role of National Educational Technology Forum (NETF) in shaping the future higher education in the country.
- To find out the Challenges of NEP 2020 in promotion of Technology Enabled Learning.
- To provide strategies to address the challenges.

Education in Knowledge-Driven Society: Re-configuration of the Teaching-Learning Paradigm

The world we live is evolving to embrace "tech futures," and in order to keep up with the growing demands of the knowledge society and knowledge-based economy, the educational framework created for young minds must also adapt in terms of both content and delivery methods of content. Students now need to learn more than just how to fit in with the system; they also need to learn how to think critically and come up with new ideas. The NEP-2020 Report states right away, stressing the coordination of relevance and excellence in the educational system in the current situation,

The reports of World Economic Forum (2018) stated that 65% of the students in school today will work in jobs that do not currently exist and 47% of today's jobs will be automated in the next decade. More than 50% of the content in a graduate degree will be useless in 5 years. These alarming data make the academia think more meticulously to look for new avenues to ensure quantitative and qualitative learning that helps the students to face the future. Now Education 4.0 can be seen as new paradigm which reinterprets the concepts as learning, student, teacher and school according to needs of Industry in Knowledge Based Society. Prior to this, Education 1.0 had been designed to meet the needs of agricultural society. Knowledge was used to be transferred from teacher to student and students focused on teacher's explanations. Education 2.0 appeared to meets the needs of industrial society. Later, Education 3.0 has evolved education to meet the needs of society by taking advantage of technology. Teachers in Education 4.0 are defined as everybody, everywhere and seen as innovation producing sources. It is need of the day that pedagogy must evolve to make education learner-centered, more experiential, holistic, inquiry-driven and discovery-oriented. The integration of technology into education facilitates the students in building the competencies they need for future; it facilitates the teacher to customize learning and create varying levels of scaffold support rather than to merely follow a one-size-fits-all approach in instruction.

Promotion of Technology Enabled Learning in Indian Higher Education and NEP-2020

The higher education system, which is at the center of knowledge creation, dissemination, and application, is essential for fostering critical and creative thinking as well as for train the professionals in technical and managerial skills that will enable the youth of the country to meet challenges in all aspects of their life. New Education Policy 2020 has been approved by Government of India with a vision to rejuvenate Indian Higher Education system in tune with Goal 4 of the UN Sustainable Development Goal (SDG 4) which seeks to ensure inclusive and equitable quality education and promote life-long opportunities for all in 2030. For creating a knowledge-based society, now India moving ahead for creating multi-skilled employability avenues. The NEP 2020 identifies the potential of new technologies such as Artificial Intelligence, block-chain, machine learning, smart boards, adaptive computer testing etc. in bringing transformation not only in what the student learn but also how they learn. Acknowledging the great impact of Artificial Intelligence on Education System, the NEP-2020 states, this policy has been formulated at a time when an unquestionably disruptive technology, Artificial Intelligence (AI), 3D/7D virtual Reality has emerged. As the cost of AI-based prediction falls, AI will be able to match or outperform and therefore be valuable aid to even skilled professionals such as doctors in certain predictive tasks. AI's disruptive potential in the workplace is clear and the education system must be poised to respond quickly (NEP-2020. 23-8, 57)

New situations and updated realities necessitate novel endeavors. The unusual COVID-19 outbreak and the ensuing lockdown have altered the educational landscape and made it necessary for us to be able to manage alternate, high-quality delivery methods in educational situations where traditional instruction is not feasible. The Indian government began a flagship initiative called Digital India in 2015 intending to transform the country into a knowledge economy and society that is enabled by technology. No doubt technology is going to impact education in multiple ways, only some of which can be foreseen the way digital initiatives of the government are implemented in Higher education in the form of MOOCS, Portals for Online Educational resources. These initiatives have been launched as flagship projects under National Mission on Education through ICT (NMEICT) which has been envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time anywhere mode. The projects under this scheme are designed for

- Connectivity along with provision for access devices to institutions and learners;

- Content generation.

This scheme plans to focus on appropriate pedagogy for e-learning, providing facility of performing experiments throughvirtual laboratories, on-line testing and certification, on-line availability of teachers to guiding and mentoring the learners, utilization of available Education Satellite, training and empowerment of teachers to effectively use the new method of teaching learning. The details about some of the flagship projects for digital education are as given below:

Table -1: Digital Initiatives in Education System by the Government of India under NMEICT

Sl. No.	Resources	Facilities for Learners
Audio Video Content		
1.	SWAYAM (Study Web of Active learning for Young Aspiring Minds)	Massive Open Online Courses
2.	SWAYAMPRABHA	High quality educational programs 24*7 on TV
Digital Content: Access Journals and e-books		
1.	National Digital Library (NDL)	Access e-content on multiple disciplines
2.	e-PG Pataskala	Get free books and curriculum-based e-content
3.	Shodhganga	Access theses of scholars of Indian Institute
4.	e-Shodhsindhu	Get access to full text e-resources
Accelerated Hands on Learning		
1.	e-Yantra: Engineering for better tomorrow	Get hands on experience on embedded systems
2.	FOSSEE: Free / Libre and Open Source Software for Education	Access and volunteer for the use of open-sourcesoftware
3.	Spoken Tutorial: Tutorial in IT application	Self-training in IT fields
4.	Virtual Labs: Web enabled experiments designed for remote operation	Try curriculum based virtual experiments
5.	National Internship Portal	Internships for students & fresh Engineers
6.	National Educational Alliance for Technology	Portal developed for the learners

Source: - https://www.education.gov.in/ict-initiatives

PM-e-Vidya is also a very useful project which houses online courses created by top hundred universities of India. It also offers e-contents and QR coded books. Transformation in digital landscape has enabled institutions to integrate technology in a wide array of teaching-learning activities e.g., online examination process in institutions like IIMs,

AIMA, Asoka University, Creation and Use of Artificial Intelligence enabled chatbot ALBELA by IIT, Guwahati. Rise of artificial intelligence applications has been phenomenal in Robotics. Higher Education Institutions (HEIs) will play an active role not only in conducting research on disruptive technologies but also in creating initial versions of instructional materials and courses including online courses in cutting-edge domains and assessing their impact on specific areas such as professional education.

NEP-2020 and Promotion of Technology Enabled Learning: Initiatives to Meet the Challenges

To remain relevant in the fast-changing field of educational technology, the NEP-2020 recommends the creation of "National Educational Technology Forum (NETF) to maintain a regular inflow of authentic data from multiple sources including educational technology innovators and practitioners and will engage with a diverse set of researchers to analyze the data. To support the development of a vibrant body of knowledge and practice, the NETF will organize multiple regional and national conferences, workshops, etc. to solicit inputs from national and international educational technology researchers, entrepreneurs, and practitioners. "The thrust of technological interventions will be for the purposes of improving teaching-learning and evaluation processes, supporting teacher preparation and professional development, enhancing educational access, and streamlining educational planning, management, and administration including processes related to admissions, attendance, assessments, etc." (NEP- 2020,23.5)

In the para 23.7 of the NEP-2020, it is stated that particular attention will be paid to emerging disruptive technologies that will necessarily transform the education system. When the 1986 and 1992 National Policy on Education was formulated, it was difficult to predict the disruptive effect that the internet would have brought. In present education scenario, competition is growing more intense, but the system is incapable to adapt to these swift and disruptive changes and it create both individuals and the country at risk. For instance, our education system at all levels unduly burdens pupils with factual and procedural knowledge at the expense of developing their higher-order competencies, despite the fact that computers have mostly outperformed humans in this regard.

Acknowledging its potential risks and dangers, the NEP-2020 recognizes the importance of leveraging the advantages of technology and calls for rigorous and transparent evaluation of these technological interventions in educational framework in relevant context. The Policy recommends "National Educational Technology Forum

(NETF) as a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, administration and so no" (NEP-2020, para 23.3,56). The functions of NETF as explained in NEP-2020 are as follow:

a) Provide independent evidence-based advice to central and state government agencies on technology-based interventions
b) Build intellectual and institutional capacities in educational technology
c) Envision strategic thrust areas in this domain; and
d) Articulate new directions for research and innovation.

The NETF would facilitate induction, deployment and effective management of technology in education. With the objectives of synchronizing with the emergence of digital technologies and the emerging importance of leveraging technology for teaching-learning at all levels from school to higher education, NEP-2020 recommends following initiatives which are enlisted in para 24.4 of NEP-2020: -

- Pilot studies for online education to evaluate the benefits of integrating education with online education while mitigating the downsides.
- Digital infrastructure to ensure that the technology-based solutions do not become outdated with the rapid advances in technology.
- Online teaching platform such as SWAYAM will be extended to provide teachers with a structured, user-friendly, rich set of assistive tools for monitoring progress of learners.
- Creation of a digital repository of content including creation of coursework, Learning Games & Simulations, Augmented Reality and Virtual Reality. For fun-based learning student-appropriate tools like apps, gasification of Indian art and culture, in multiple languages, with clear operating instructions, will also be created.
- Addressing the digital divide, the existing mass media, such as television, radio, and community radio will be extensively used for telecast and broadcasts.
- Training and incentives for teachers to work upon learner-centric pedagogy and on how to become high-quality online content creators themselves using online teaching platforms and tools.
- Emphasis on adoption of Blended models of learning to enable learning environment for optimal learning.

Challenges of NEP 2020 in Promotion of Technology Enabled Learning:

The National Education Policy 2020 (NEP-2020) is a comprehensive policy that aims to transform the higher education system in India. While the policy has several positive aspects, there are also several challenges that need to be addressed.

1. A rigid separation of academic disciplines due to a highly fragmented higher education ecosystem. This policy's major goal is to stop the fragmentation of higher education by turning institutions of higher learning into multidisciplinary universities. Make sure there is a large, multidisciplinary university or college in or close to every district as part of the higher education system. Transforming HEIs into sizable multidisciplinary institutions with a target enrollment of 3,000 students or more. By 2030, every district must have at least one multidisciplinary HEI.
2. NEP2020 aims to simply double the Gross Enrollment Ratio in higher education by the year 2035 which requires us to build one new institution every week for the following 15 years.
3. Few HEIs offer the local language as a medium of instruction. All HEIs in India should provide courses or programs in regional or local Indian languages.
4. Low standards of undergraduate education are a byproduct of large affiliated universities. The policy aims to push institutions towards academic and administrative autonomy.
5. As opposed to the current teacher-centric model, in which teachers decide the courses, curriculum, evaluation and pedagogy, a student-centric model will be developed that will give students the right to decide their learning and its pace for enhanced teaching-learning experiences. The strategy calls for a comprehensive structural redesign of the curriculum, but in order to deliver this curriculum effectively, we need teachers who have received pedagogical training and are aware of its requirements.
6. Favorable environment for Ed Tech: The proliferation of online education is also greatly influenced by the accessibility of devices and the simple, affordable, and easy-to-use internet. Economically and environmentally, digital is cheaper and cleaner than paper-based materials to distribute and update. With respect to cost and diversity of delivery, Ed Tech is more portable, reaches remote areas and can be used to reduce the constraints of geography. Accessing remote areas can help expand perspectives. The rationale is that an enhanced infrastructure affords greater access to better education for all. This is where reasonably priced online learning is useful with the quicker adoption of digital education in HEIs. Open Universities can address the issue of accessibility and availability of high-quality education.

Enrollment issues could be addressed by utilizing quick, adaptable, and affordable digital infrastructure.

7. NEP2020 has made several reasonable and reformative steps toward the encouragement of online education through MOOCs. The government encourages SWAYAM and other MOOC platforms in HEIs. Now eContent, digital repository, and coursework are publicly available on Swayam, Swayamprabha, NPTEL, NDL, Subodh, Subodhganga, and Vidwan.

But this initiative leads to various insufficiencies as below:

1. Generates more and more burden and overcrowding on the centralized MOOC model.
2. MOOCs lack direct interaction and feedback from instructors. Course contents are one-sided and non-interactive which is regarded as a passive method of learning.
3. The learning is not outcome-based which is not according to NAAC compliance.
4. The quality of MOOCs varies greatly, and some may not meet the expectations of students. Sometimes excessive courses on the same topic, programs or discipline, and occasionally the course content are restricted.
5. MOOC content is based on a publicly-shared curriculum and is not compatible with HEIs curriculum and course syllabus.
6. Sufficient Resources and Content are not available for most of the course.
7. Teachers and course instructors who appear in videos are different from their offline counterparts which may create a conflict of interest.
8. Course creation is a continuous process that requires constant effort.
9. These contents lack reliable backup, restore and version management mechanisms.
10. Continuous tracking and follow-up system is required.
11. Technical issues are not addressed immediately.
12. To be successful online educators, teachers must receive the proper training and growth. A good instructor in a traditional classroom may not necessarily be a good instructor in an online classroom.
13. Scaling up online assessments while preventing unethical behaviour presents many difficulties.

To avoid this dire situation and to make whole Online Education comprehensive and efficient, HEIs can use institute-owned LMSs which are comparable to SWAYAM MOOCs.

Institute-owned Learning Management Systems (LMS) have several advantages, including

1. Customization: An institute-owned LMS can be customized to meet the specific needs of the institution, making it more effective and efficient.
2. Control: The institute has complete control over the LMS, including data management, security, and user access. Reliable backup, restore and version management mechanisms.
3. Dual mode: teacher-led study as well as individual study.
4. Localization: It provides resources and classes in the relevant local language.
5. Integration: An institute-owned LMS can be easily integrated with other institutional systems, such as student information systems and assessment tools.
6. Cost-effective: In the long run, an institute-owned LMS can be more cost-effective compared to subscription-based models.
7. Data privacy: An institute-owned LMS ensures that sensitive institutional and student data remains within the control of the institution.
8. Reliability: An institute-owned LMS can provide more reliable and consistent performance, as the institution can manage its own hardware and software infrastructure.

Strategies to address the Challenges:

Higher Education Institutions can contribute effectively to realize the objectives of National education policy 2020 by adopting sustainable (green ocean), competitive (red ocean), monopoly (blue ocean), and their mix called growth and prosper strategies. Universities should have a dynamic leader to implement educational innovations to get first-movers-advantage in quality improvement. Some of the specific strategies for higher education space are listed below:

(1) Developing a progressive curriculum: Updating curriculum periodically as per current and future industry requirements by adding the latest changes and developments in the subject are essential to create interest among the students and to improve their innovativeness is essential. Developing new and effective pedagogy is also important to an effective and efficient teaching–learning process.

(2) Research focus: As per NEP-2020, research and publication is the focus of higher education. Research components in the curriculum in all levels of higher education stimulate independent and innovative thinking among students. Through developing researching mindset, students develop attitude for problem identification, identifying alternative

solutions, analyzing these solutions to find the optimum solution, and implementing such solution in real world problem.

(3) Introduction of Multidisciplinary subjects: Studying multidisciplinary subjects in higher education encourages students to think laterally and creatively while analyzing a problem or situation. Introducing STEAM based curriculum is found to be more effective than STEM based curriculum in the higher education system.

(4) Choice of Teaching focuses university or Research focus University or mixed university: Depending on the goal set by the university based on the available resources, it can eventually end up into research focused university or teaching focused university. Teaching focused universities have to compete with other universities while offering innovative undergraduate and postgraduate programs. Hence, they have to follow competitive strategies suggested by Porter, M. E. [23]. The research focussed universities can prosper and become unique performers in selected super specialty areas and become centre of excellence in certain identified subjects which are futuristic by following the blue ocean strategy suggested by Kim, W. C. (2005) [13].

(5) Competitive and unique infrastructure: It is known that generation Z and generation A are tech-savvy and health-savvy, and they are the customers of universities in future days. In order to attract these new generations, universities have to focus on developing attractive physical and digital infrastructure including facilities for co-curricular and extra-curricular activities. It is expected that future generations can be attracted to the university education to increase GER by creating unique infrastructure in the campus both for academic teaching learning and comfortable living facilities.

(6) Monopoly research and contribution: Universities should develop specialized research centers in futuristic areas which are capable to contribute uniquely to solve basic needs for sustainability, advanced wants for comfort ability and dreamy desires for the fantasy of people in society by using monopoly strategy.

(7) Low cost & high quality for students: In order to attract students of all economic categories to higher education to enhance GER towards 100%, universities should provide high quality education at a low cost. By using emerging technologies effectively and strategically, universities can increase their class size without compromising quality can become low cost players. Additionally, the administrators of the universities should be role-models to others by adopting simple lifestyles with honesty and openness.

(8) Strategic collaboration with industries for internship & job: Strategic collaboration is a part of the competitive strategy. By identifying and networking with related industries, the

various departments of the universities can have a cordial relationship with national and international companies of selected industries to offer paid internship to the students and campus directed job opportunities to the graduates.

(9)) Collaborative strategy with other Universities and Institutions: In order to become low cost player and yet provide required infrastructural facilities to the students, the universities have to follow a collaborative strategy with other universities and super specialty educational institutions.

(10) Expansion strategy by absorbing weak colleges as constituent colleges: One of the beauties of NEP-2020 is the well-defined life-cycle of HEIs. Accordingly, if an HEI is failed to expand and improve as an independent degree granting autonomous institution or university during 10 years timeline, eventually it will be absorbed by the affiliating university to become part of large supportive system. This is an opportunity for public funded colleges but a challenge and punishment for private institutions. Thus, all affiliated colleges should plan and implement proper expansion strategy to become an autonomous degree granting institution. Alternatively, public universities get an opportunity to absorb such weak colleges that fails to transform them into the next autonomous category.

(11) University publication press and peer reviewed & indexed journals: The end of every research project is the publication of results in the form of copyrighted scholarly publication in journals or patented products or processes. In order to present developed new knowledge and new interpretations to the public society at comparatively high speed before they get obsolete, universities should plan to start or support their own publication unit for both books and indexed scholarly journals in different fields.

(12) Strategy for increment and promotions: Universities should adopt performance based annual increments and promotions by developing a progressive annual performance indicator format which should encourage the planned, committed, and dedicated contributing faculty members through hard work for prosper.

(13) Strategy of adopting Accountability: Every university should develop a strong accountability policy for its employees from top to bottom. The leaders or heads of university and departments should be role-models and motivate others in their university and departments for exceptional performance to increase the research productivity of the university.

Conclusion: -There is no denying the fact that the integration of technology in education to foster life-long learning is need of the day. The emerging knowledge society is looking for the people who are able to maximize their creative potential, the people who not only master existing skills and knowledge, but who are capable of creating new skills and knowledge. The government of India is keen to promote TEL to make higher education accessible to all deserving students as it is evident in the recommendation of NEP-2020. The success of these plans and recommendation lies in the way the efforts for execution are made, the way the challenges are handled, the way awareness is created among students as well teaching fraternity. Every new initiative taken in the direction of integrating technology in education should aim atco-ordinating excellence and relevance, maintaining a balance between the quality i.e., the intellectual and educational mission of higher education and the relevance i.e., the social function of higher education for a progressive society.

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