



APTI Women's Forum

# Newsletter



New Education Policy 2020  
Reforms, Opportunities and Challenges

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# Editor's Note



**Prof. Vandana B. Patravale**

Chief Editor, APTI Women's Forum Newsletter

## **Dear Readers,**

I am delighted to welcome you all, on behalf of APTI Women's Forum, to the present issue of our Newsletter. Education is the most essential tool for a nation's development and the current issue of APTI Women's Forum Newsletter will talk about the latest National Education Policy (NEP) 2020, that has been proposed by the Government of India. Our previous issues highlighted our battle against the ongoing COVID-19 pandemic along with ways to combat infectious diseases. The ongoing pandemic has been an eye opener on many levels including the education sector which is now completely running off campus since the past year. It is imperative that the educational sector is reformed in a manner that benefits the student community in these difficult times as well as in future. Change at the grassroots level will ensure that the future generations are trained in the most liberal as well as competent environment where they have the freedom to choose from multiple disciplines of study rather than constricting their focus on only one particular subject. The policy has been designed to inculcate overall holistic development of individuals right from school going age up to their higher education. Inculcation of subjects ranging from vocational, arts, music, commerce, science, and sports is a sought-out strategy throughout the policy in order to enable an individual to pursue all that he/she wants under one roof! The vast scale of development of global educational systems demands that the students that we prepare and train in our country should be able to compete without any hesitation on any global platform. It will not only ensure students' growth on an individual level, but also improve the socio-economic potential of the entire nation.

In this issue, we will aim to widen our readers' perspectives towards the educational reforms from the point of view of academicians as well as experienced industrial experts who have made invaluable contributions to the society. These expert opinions in the form of articles will serve as a guiding light for the students and enlighten all our readers in numerous ways by invoking a better understanding regarding NEP 2020. They will highlight the need, reforms, challenges and expected outcomes of the policy and their impact on the current education system. We also have an interesting interview line-up in this issue to answer all our queries regarding the impact of NEP 2020.

The editorial board extends most sincere appreciation towards all the authors for taking precious time out and making this newsletter immensely insightful. I would extend a special vote of thanks to Dr. John Disouza for taking lead in identifying experts for the interviews and preparing apt questionnaires, making the interview section a big highlight of this issue. I thank the entire editorial team for their efforts in conceptualizing this newsletter. I am hopeful that you all will take pleasure in reading this newsletter as much as we enjoyed bringing it forth to you.

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# *'Acharya Devo Bhava'* the Only Mantra to Re-emerge as *'Vishwa Guru'*: National Education Policy 2020



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## **Purpose of Education**

The education system believes in prior conceptions of an 'educatedness' and 'educated person'; which are often granted but generally not spelt out openly. For the educationists' it is important to sketch the portrayal of an educated person, so that if agreed on it, we can design and optimize educational programs to maximize our efforts in the educational setting(s) to generate educated persons. Educated person is one who has undergone a process of learning that results in enhanced mental capability to function effectively in familiar and novel situations in personal, social and professional life. In order to function effectively the person needs to acquire – basic minimum knowledge; thinking abilities involved in creating and critiquing knowledge; language abilities for clear, precise, and effective communication for epistemic purposes; independent learning abilities to enhance knowledge, thinking and language abilities; and mindset to facilitate all of these attributes (1,2). Based on this the higher education (HE) has four dovetailing goals (3):

1. Dissemination of existing knowledge;
2. Training of students to transform them into human resource that industry/ market expects;
3. Training of researchers for creating and critiquing knowledge; and
4. The development and enrichment of the intellectual, moral, emotional, physical, social, cultural, spiritual potentials of individuals.

In the world of employment, what matters is the specialised knowledge of a discipline and a set of specialised skills, a set of mental qualities and overall abilities which may be called as 'intelligences', explained as follows (4):

1. Learning intelligence: ability to learn new things, to adapt oneself to new situations;
2. Critical intelligence: ability to assess situations, ideas, and arrive at decision(s);
3. Creative intelligence: ability to innovate ideas, solutions;
4. Interpersonal intelligence: ability to deal with people;
5. Communicative intelligence: ability to express oneself clearly and effectively, to understand what others are saying, to persuade others.

These intelligences create the basis of the competitive edge in the job market. But 'what educators do to develop and enhance these qualities?' is a big question to be answered by HEIs. With the introduction of National Education Policy – 2020 (NEP-2020), the purpose of education is redesigned. The purpose of education is 'Nation's Development' through vibrant, inclusive, equitable quality education to all i.e. teaching-learning and assessment processes, helping every individual to achieve full of his/ her potential, through lifelong learning opportunities, as depicted in figure 1.

The aim of the NEP-2020 is to regain our status as ‘Vishwa Guru’ i.e. to transform Bharat into ‘Global Knowledge Power’, equitable and vibrant knowledge society. It is understood that this transition is possible if education can transform students into responsible, sensitive but strong and contributing Indian and Global citizens. Indian citizens with deep respect to fundamental duties and constitutional values; bonding with the country; awareness of one’s roles and responsibilities; and deep pride being Indian, not only in thoughts and words but in spirit, intellect and deeds. The global citizen with full set of knowledge, skills, values, and dispositions capable of addressing issues related to human rights, contributing in sustainable development and global well-being (5).

The HE must aim developing individual with good, well-rounded, thoughtful personality with deep knowledge, curiosity, creativity, scientific temper, spirit of service, social consciousness, developed ethical character with respect to constitutional values and capabilities across range of disciplines including sciences, social sciences, arts, humanities, languages, professional, technical and vocational. The skills should enable economic independence, personal accomplishment and enlightenment, constructive public engagement and productive contribution to society. This transformation will be possible only through holistic and multidisciplinary education instilling of skills and values; and setting education as basis for knowledge creation contributing to National economy. To achieve these aims NEP-2020 advocates (6):

- a. Bringing back the 64 ancient arts into main stream of education;
- b. Educational approach that integrates art with science, technology, engineering, mathematics (STEM);
- c. Constant positive learning outcomes; and
- d. Developing all capabilities – intellectual, emotional, ethical, physical, and social.

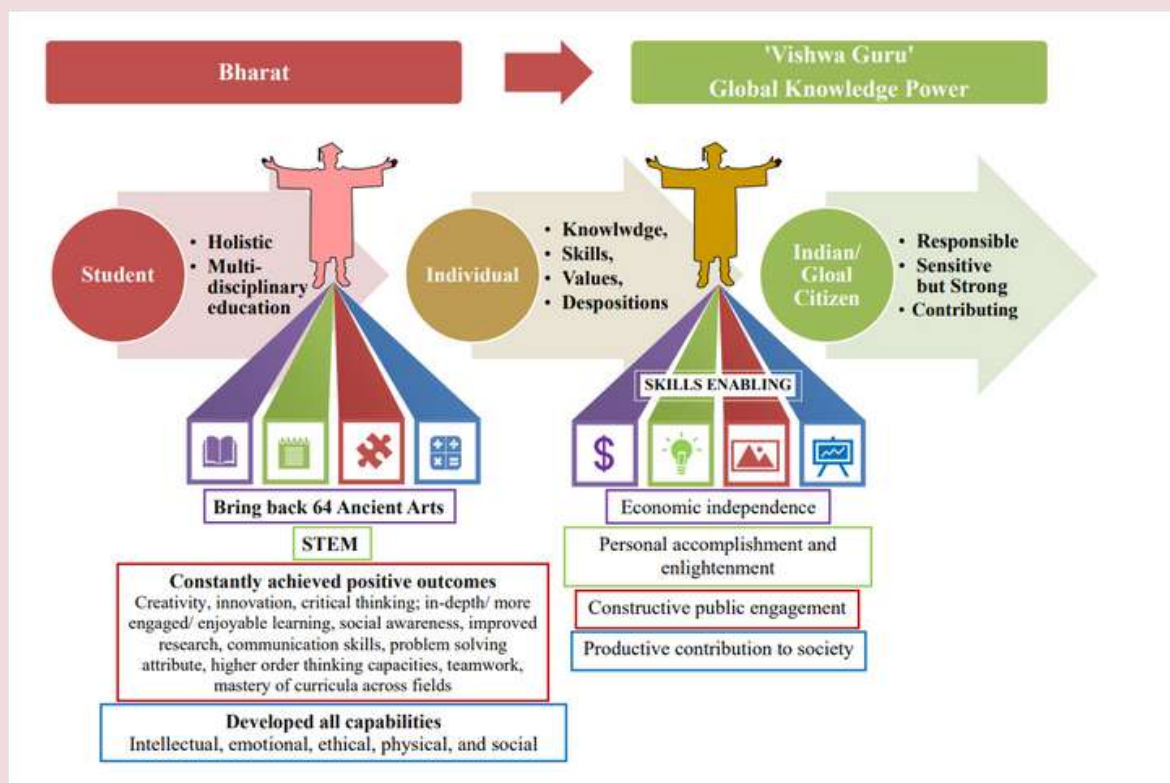


Figure 1: Aims, objectives, vision of India’s National Education Policy 2020

The constantly showed positive learning outcomes are – increased creativity, innovation, critical thinking; in-depth learning, increased social awareness, more engagement in learning, improved research, communication skills, problem solving attribute, higher order thinking capacities, teamwork, more enjoyment in learning, along with mastery of curricula across fields. This will be possible to achieve by enhanced quality in all the three domains – teaching-learning, research and community engagement; the core expectations of NEP-2020 (7).

Additionally, technical education must aim generating professionals in cutting edge technologies including artificial intelligence (AI), machine learning (ML) along with addressing their disruptive potential; 3D machining; big data analysis along with awareness of data privacy laws and standards of data handling and protection; genomics; nanotechnology; biotechnology; neuroscience etc. (8).

### **Image of Teacher**

Ancient days, India was known to the world by the names of great gurus like –Charaka and Susruta, Aryabhata, Bhaskaracharya, Chanakya, Patanjali, Panini etc. But down the timeline, then gurus and today's teachers have lost their respect in the society, whatever are the reasons (9).

The recently published Global Teacher Status Index survey (GTSI, 2018) depicts about the countries where teaching profession is most respected. The survey was carried on following bases (10):

- Respect to the teachers in relation to other professions;
- The social standing of teachers;
- Facts and people's perception of working hours and salaries paid to teachers;
- Do the salaries that teachers get are performance wise?
- How much teachers are trusted to deliver a good education to the students?
- Whether parents would encourage their children to be teacher?
- Whether it is perceived that children respect their teachers?

China stands top in the list of 25 countries been surveyed, followed by Malaysia, Taiwan, Russia, Indonesia, Korea, Turkey followed by India. Though sadly, it is accepted that in India – till today, the role of the teacher is circumscribed to clerical tasks and transaction of the curriculum and further conducting prescribed examinations.

### **Role of Teachers in 21st Century Education**

Teachers are most important and critical stakeholders of education system; the backbone of our education system. Responsibility of 'creating and shaping generations' lies on their shoulders. So, one of the major objective of NEP-2020 is to foster the spirit, '*Acharya Devo Bhava*', and it is very well accepted that – for education to be powerful, the teachers need to be empowered first; to be re-established at all levels, as the most respected and essential members of our society (11).

It is very well understood that – the success of HE is always governed by quality of faculty and engagement of faculty. Motivated, energized, capable, happy and enthusiastic teachers are the key to succeed in achieving objectives of education system.

Hence the policy directs few of the most important steps to be taken (12,13):

- Increased student: teacher ratio;
- A technology-based comprehensive teacher-requirement planning forecasting exercise to assess expected subject-wise teacher vacancies;

- Filling teacher vacancies at the earliest, in a time-bound manner;
- Transparent, systematized, responsible, merit-based recruitments with equitable presence and special attention to employing local teachers or those with familiarity with local languages;
- Measures to recruit the very best and brightest to enter the teaching profession at all levels, by ensuring livelihood, respect, dignity, and autonomy;
- Equipping basic infrastructure facilities along with the digital resources appropriately intertwined in the teaching-learning process with a focus on the process of knowledge creation;
- Instilling in the system basic methods of quality control and accountability;
- Training, encouragement and support for continuous professional development to develop and enhance all the dimensions including conceptual, practical, personal and social skills;
- Performance-based compensations;
- Career progression, professional development opportunities, motivation, ensuring culture of excellence, tenure track and incentives (rewards, promotion, recognition, movement in leadership level) to improvise the teachers' performance;
- Freedom in pedagogy; etc.

### Teacher Education

While considering the responsibilities of teachers in nation building, various reforms in teacher education are suggested by NEP-2020, as explained in figure 2. A new and comprehensive National Curriculum Framework for Teacher Education (NCFTE-2021) will be set by the National Council for Teacher Education (NCTE) in consultation with the National Council of Educational Research and Training (NCERT) (14,15).

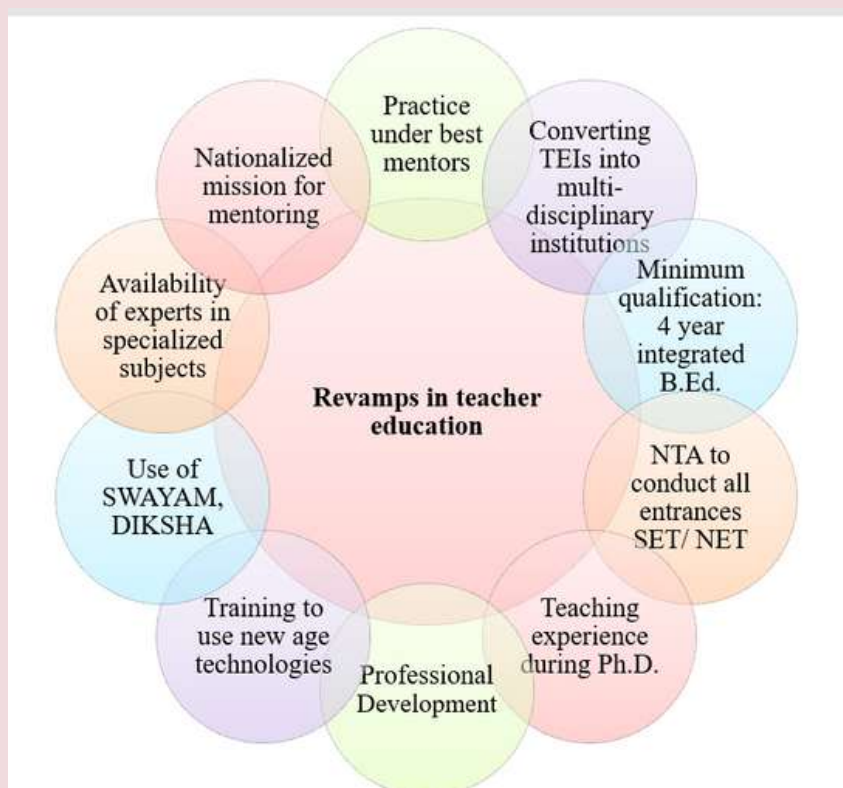


Figure 2: Revamps in teacher education, suggested by National Education Policy 2020

## Empowering teachers

If India needs to achieve aims and objectives of NEP-2020; teachers are necessarily to be improved in all the three domains – teaching-learning, research and community engagement (16).

### 1. Teaching-learning:

#### **Paradigm shift from teaching to learning**

Over last few decades the world of HE has been shifting its focus from teaching to learning. Earlier with less number of students per class, a teaching-led education was sufficed. Syllabus is to decide what should be taught, teachers use to do a sincere job of teaching. Smaller classes use to allow attention to individual students, with full possibility to assistance if student is facing difficulties. The expectations about what is learnt by a student was modest, as the employment world was simpler (17).

The situation is completely different now, due to massification of HE and workplace has become more complex, sophisticated and multidimensional. What is learnt in HE is not sufficient for working. Subsequently, demands regarding what students learn in HE have soared and the focus of education has shifted from ‘teaching by teachers’ to ‘learning by students’. The learning outcomes and graduates’ attributes are being driven largely by the workplace of the future. So, it must be ensured that – teaching should lead to good learning; only possible if teachers possess certain skills or capabilities or competencies basic minimum two are (18):

- Subject matter expertise (SME)
- Effective teaching techniques (ETT)

Learning will not be possibly achieved if a teacher with limited understanding of the subject teaches the subject to a large class. A teacher with SME, intelligence, analytical and creative capabilities developed while doing Ph.D., suffices modest learning expectations. For advanced learning by students, teaching has to be much more than “brilliant lectures by experts”. This focuses on importance of ETT in teaching-learning process. The set of ETT that can lead to great teaching is evolving, and it remain an area of research. Most favourite ETTs of 2020 are summarized in table 1 (19).

In fact, it is observed that good SME, without using ETT, the learning outcomes achieved will be modest – there are umpteen examples of brilliant scientists who were simply not good teachers. For instance, if we consider two dimensions – SME and ETT, and by considering capabilities as medium or high, we get 4 quadrants, the learning effected is explained in the matrix shown in figure 3.

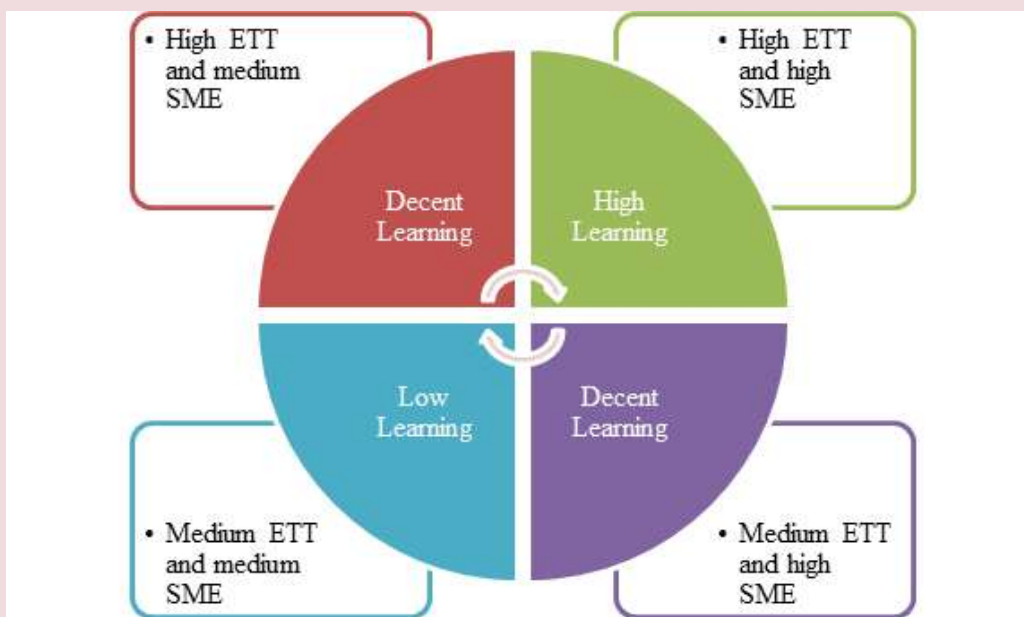


Figure 3: Matrix that suggests good combination of SME and ETT

Table 1: 13 effective teaching methods most widely used in year 2020

Sr. No.	ETT	Fundamental concept and advantage(s)
1.	Project-Based Method	Students have to complete a curriculum-based project assigned by a teacher and earn grades after suitable evaluation, which enhances involvement of student, knowledge depth leading higher-level learning
2.	Task-Based Method	Students have to complete task(s) given by teacher, that helps develop skills and competencies including decision making
3.	Creative Teaching	Teachers include creative tasks, different games or visual exercises to develop the creative thinking of learners in teaching-learning process and ask students to explore it
4.	Brainstorming Sessions	The class is divided into groups, pairs and involved into a discussion of a particular topic helps to make everyone participate in classroom activities and find out the solution, which improves problem solving and communicative skills of students
5.	Storyboard Teaching	Creating a storyboard helps students understand complicated topics in an easy way because of the visualization of the story, also helps to develop students' imagination
6.	Working on the Learning Environment	Equipping classrooms with all those facilities that students can use to explore their subject concepts, teachers can take them to field trip to better understand the subject(s)
7.	Flipped Classroom	Students get ready for the class at home by researching the materials, reading the given lectures, watch video tutorials and online webinars etc and teachers answer the questions of students and or encourage group discussions in classroom settings
8.	Self-Learning	Teachers provide learners with the central node of a topic and ask students to research the topic may be creating a mind map using their own ideas, leads to better understanding of the topic
9.	Gamification	Teachers can create games, projects or quizzes and provide extra motivation to encourage students, which makes learning more and more interesting and competition makes learners perform better
10.	Using Social Media	Using social media for keeping students busy in learning process as well as assigning task to be completed using social media
11.	Formative Assessment	In-process evaluations of student comprehension, learning needs, and academic progress that helps learners track their weak spots and find out the fields they need to concentrate more on and teachers to improve their teaching methods as well
12.	The Desire Method	Teachers show the benefits and the practical use of the knowledge to students in shaping their career for example knowledge of microbiology in microbiological quality control of medicines
13.	Using Audio Visual Material	To keep learners interested and involved and to improve understanding of visual and auditory learner's, audio(s) and video(s) are added into the traditional learning experience

In developed countries, where there are centres of 'teaching excellence' and an abundance of capable and qualified people, finding faculty with high SME is not much of a challenge, their goal is to strengthen the ETT.

In India, the situation is quite dissimilar. Faculty with apt SME are really available only in top HEIs. In most other HEIs, the SME of faculty is often not too deep. Consequently, most of the faculty training programs target the SME challenge. However, an effort to train faculty in ETT, can also help these HEIs improve the learning. It is possible that continued focus on 'good learning outcomes' may also result in improved SME, as desire to deliver learning outcomes will inevitably lead to 'learning by faculty' of important advances in the subject, designing interesting projects and assignments, reviewing what is being done in other HEIs etc. SME takes years to develop, learning ETT is not that hard or time consuming. What is really required is motivation and support to faculty to learn and apply these ETTs.

What we have discussed is only two levels of SME – medium and high, what if the teacher's SME is low? In many developed countries, unfortunately including India; there are indeed many faculty in HEIs who are not having even a decent SME. No amount of ETT can help in this situation (20).

### **Use of technology in teaching-learning process**

To increase Gross Enrolment Ratio (GER) in HE, NEP advocates use of open distance learning (ODL) and use of technology to make teaching-learning process more are more interesting and flexible and converting traditional classroom delivery to online is need of hour. With the availability of digital/ fiberoptic infrastructure and collaborations with National Research and Education Networks (NRENs) providing digital libraries, subsidized/ free cloud services, capacity building and learning management solutions (LMS) online learning can be affected. With the advent of various initiative like – Eduroam; EduGain; Up2U, LMS like Moodle, Blackboard, Canvas; CERNBox; SWAN; MOOC platforms like Coursera, EdX; video-conferencing solutions like ZOOM, D2L, WebEx, Google Meet, Microsoft Team, Connect, Skype for Business; open source solutions like Big Blue Button, EduMEET; and cloud providers such as Amazon Web Services, Microsoft, Google and NRENs themselves infinite things are now possible as per as ODL is concerned. What is required is – mending technological gaps and training teachers in effective use of technology in teaching-learning and continuous assessment too (21).

## **2. Research**

India may be the only large country where HEIs conducting research are not clearly defined and supported by government or private entities. Out of India's 900-odd universities, only a handful conduct good quality research and have their papers published in reputed international journals. The rest are largely teaching-focused doing little and probably mediocre research. Only 10% of HEIs are research-intensive precisely counted as 70 by Carnegie Classification (22).

Some of the observations of research outcomes of Indian Universities, in comparison with other countries are depicted in figure 4. Countries GDP expenditure on research, quality of research publications, patents granted and applied, international collaborations and impacts of publications are considered as the indicators of the performance (23).

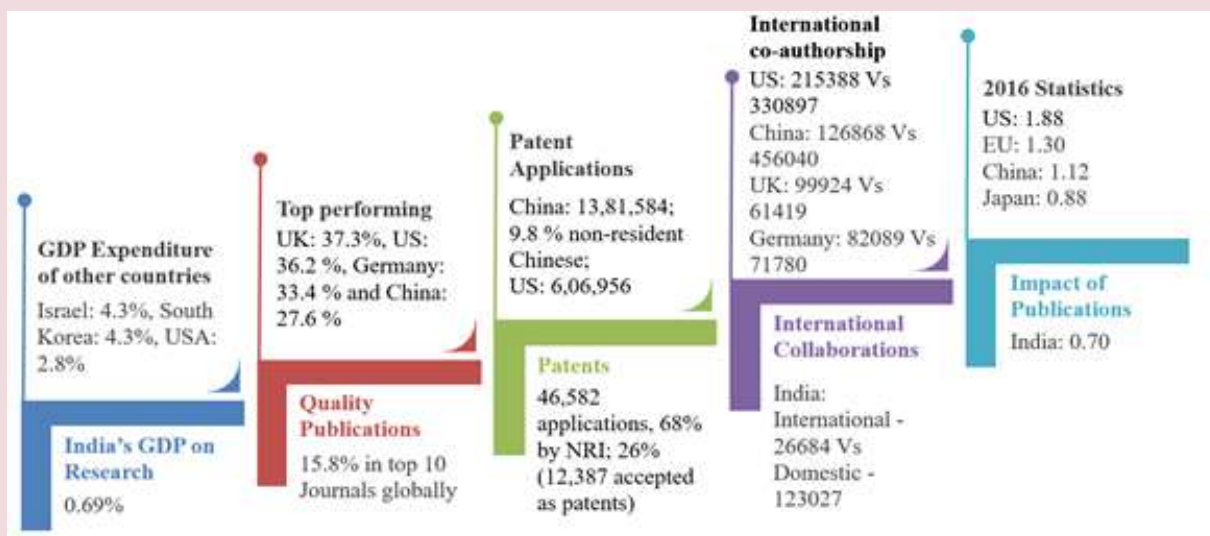


Figure 4: Research performance of Indian Universities in global context (as per the data of year 2016 & 2018)

Research expenditure of India is poor. Indian HEIs needs to leverage in both quantity and quality of research projects that they take and if they really want to excel in research then they should work in 10 domains of outcome of research as depicted in figure 5 (24).

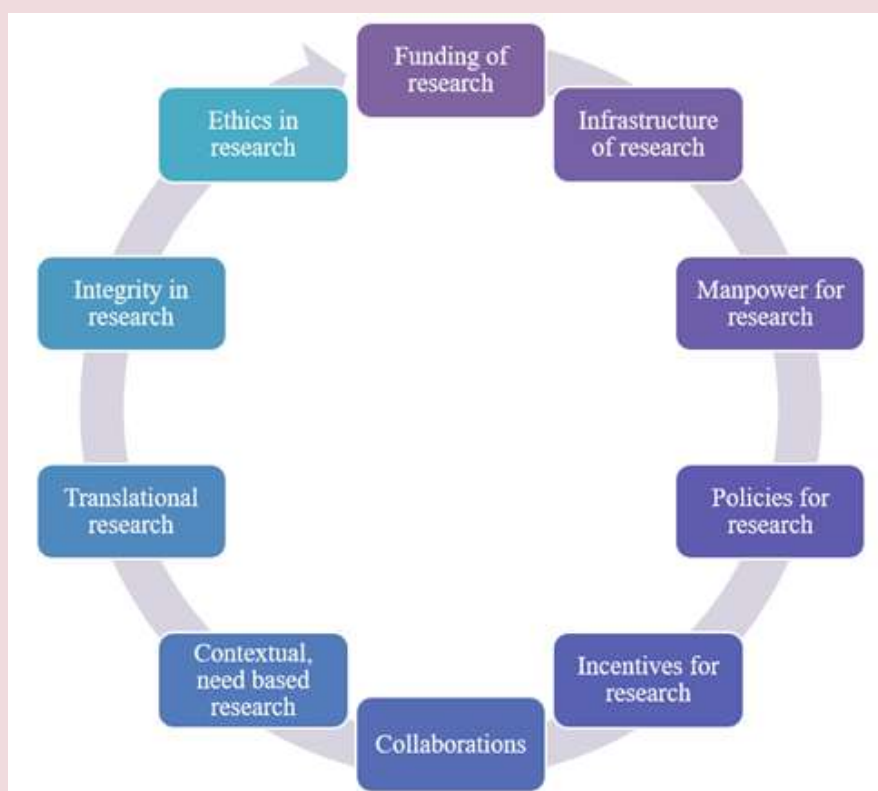


Figure 5: Top ten measures to enhance research quality and output

Catalysing research is one of the important initiative of NEP-2020, as it is rightly understood that – knowledge creation and research is must to develop vibrant economy. NEP emphasizes on development of research mindset in school education itself and plans to take strong steps to improvise quality of research like;

- Building robust ecosystem on research;
- Significant expansion of research capabilities across disciplines;
- Comprehensive approach to transform quality & quantity of research in India;
- Focus on societal challenges like – climate change, population dynamics, clean drinking water, sanitation, healthcare, air quality, energy, rising AI-ML etc.;
- Establishment of National Research Foundation (NRF) to fund and support research.

NRF will be established to seed developing research infrastructure; fund quality research in particular in leading societal issues; liaison between researcher and government, industry, other researchers; and recognise outstanding research as depicted in figure 6. Teachers of HE must empower themselves to take the advantage of these changing scenario and must take trans/ multi-disciplinary research while contributing in new knowledge development and hence transforming India into vibrant knowledge society (6).

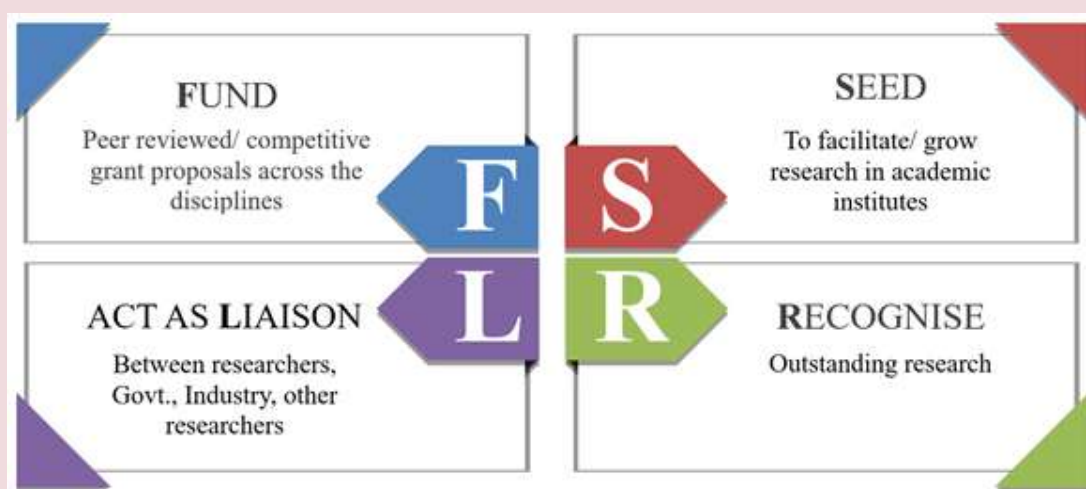


Figure 6: Fundamental functions of National Research Foundation

### 3. Community Engagement

By rightly understanding role of active community engagement (CE) of HEIs in achieving socio-economic development, India is preparing to foster CE in HEIs. Unnat Bharat Abhiyaan (UBA) 2.0 was launched in 2018 by the Ministry of Human Resource Development (MHRD), with aim to bring a transformation in rural development by the active participation of HEIs with rural communities and reorientation of communities' thorough research and development. In response to this the University Grant Commission (UGC) has formed the Subject Expert Group (SEG) on Curricular Reforms and for achieving the objectives of UBA(25).

### Global Initiatives

Around the world, HEIs are being encouraged to foster social responsibility (SR) and CE in their teaching and research activities over the past decade. In 1999, UNESCO supported a new Global University Network for Innovations (GUNi) ([www.guninetwork.org](http://www.guninetwork.org)). In 2014, GUNi's 5th World Report on HE brings together global experiences on the theme “Knowledge, Engagement and HE: Contributing to Social Change”; proposing integration of CE into all institutional activities, as a way of ranking and rating (26). The global initiatives taken demonstrating the growing practice of CE, few worth mentioning are (27):

- Living Knowledge Network in Europe (<https://www.livingknowledge.org/>); emerged from the movement of ‘Science Shops’, began in the Netherlands in 1970s to mediate research on community identified problems jointly.

- PASCAL International Observatory ([www.pascalobservatory.org](http://www.pascalobservatory.org)); with focused attention on promoting HE partnerships with regional and local governments.
- The Talloires Network (<https://talloiresnetwork.tufts.edu/>); began in 2005 focusing on the promotion of HE engagement in communities to strengthen democratic citizenship amongst youth.
- National Centre for Coordinating Public Engagement (<https://www.publicengagement.ac.uk/>); supported by the Government of UK.
- European Union's Horizon 2020, Responsible Research and Innovation (<https://rri-tools.eu/>); focused on mainstreaming public engagement in all research projects of universities.

India is a signatory to United Nations 17 Sustainable Development Goals (SDGs). In achieving these 17 SDG goals HEIs can play significant role. GUNi in its 6th 'World Report beacons HEIs to engage with SDGs' (5,28):

1. Educating the SDG generation to make the SDGs a reality; with the necessary knowledge, skills, competencies and partnerships, thereby helping to produce new SDG leaders;
2. Conducting transversal reviews and refinements to ensure the mainstreaming of SDG issues across curricula and including new values and practices for economic development that enhance social equity and resolve environmental risks.

### Community Engagement in India

CE of HEIs in India is still in infancy. A national review conducted in 2011 by a Committee of Experts, set up by the then Planning Commission have proposed many recommendations to promote CE in HEIs. The key principles that guides CE of HEIs are – mutual learning and respect; university-wide, across faculties/ disciplines inclusion in CE; credits to students and teachers engages in CE; and linkages with local institutions as depicted in figure 7.

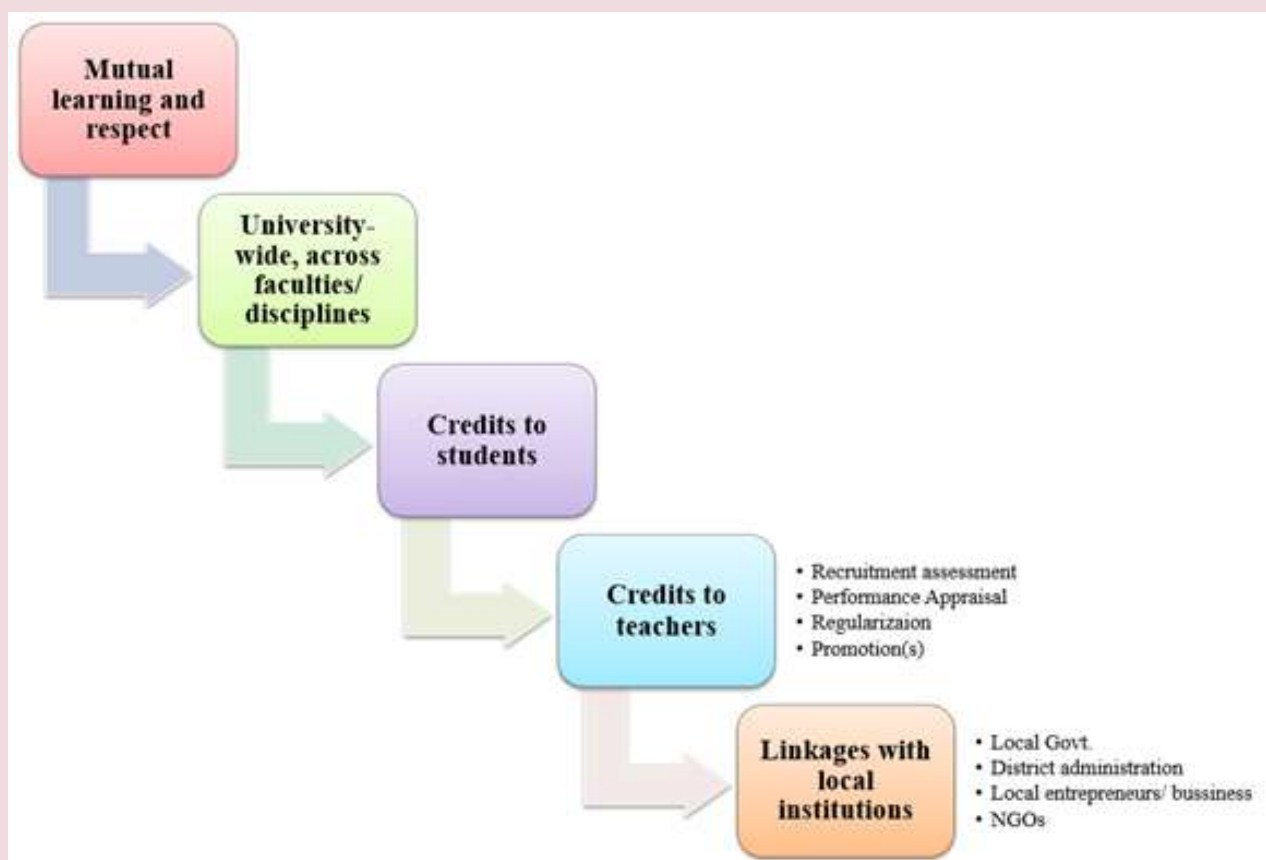


Figure 7: Key principles of community engagement in HEIs

Once the principles of CE are applied in practice by HEIs, any combination of the various forms of CE may be adopted:

**a) Linking learning with community service;** achieved through the model like ‘service-learning’ where students/ teachers can apply their knowledge to address the challenges of the community.

**b) Linking research with community knowledge;** where research is designed on the basis of community knowledge through model like Community-Based Participatory Research (CBPR).

**c) Knowledge sharing and knowledge mobilization;** where knowledge available in HEIs is made available to the local community to realize its developmental aspirations, secure its entitlements and access its benefits from various agencies and schemes.

**d) Devising new curriculum and courses;** where new curricula in existing courses and new courses are designed to engage with community.

**e) Including practitioners as teachers;** where local community and civil society practitioners who are with enormous practical knowledge are involved to co-teach courses both in the classrooms and in the field.

**f) Social innovations by students;** where students are encouraged to take learning projects with a social impact.

HEIs are supposed to participate in CE by various means like – conducting compulsory CE course(s), adapting CE components in existing course(s), offering CE based courses, and undertaking research partnerships with local community etc. (29).

### **1. Compulsory community engagement course(s)**

It is recommended that each HEI conducts a compulsory course to provide CE to all undergraduate (UG) and post graduate (PG) students so that their appreciation of rural field realities is holistic, respectful and inspiring. Table 2, depicts summary of some of the courses that expert committee has recommended (30).

### **2. Adapting existing courses**

Special efforts must be taken to link classroom theory with the realities of the local fields. This will enrich curriculum, improve quality of learning in HEIs and inclusion of CE will bring satisfaction of service to the society in the minds of students and teachers of HEIs, examples – farm on campus, involvement of students/ teachers in national health programmes including immunisation, health-hygiene awareness, sanitation, energy, employment, women’s livelihood, rural tourism etc.

### **3. Offering new course(s)**

Effective CE leads to dynamic revision of curriculum and introduction of new courses. HEIs must design and introduce new course(s) at UG and PG levels fostering SR and enabling CE. For instance, engineering students can take courses in water harvesting, non-conventional energy generation, energy conservation low cost housing etc.

### **4. Undertaking research in partnership with local community**

If a mutually beneficial partnership with local communities may become supportive of new knowledge and its use, that can provide solutions to local challenges. Examples of few of such initiative already undertaken are (31):

- Community-University Research Alliance (CURA) in Canada
- Community-Based Participatory Research (CBPR) in India
- Knowledge4Change (K4C) Consortium by Pt. Ravi Shankar Shukla University, Raipur
- Centre for Indigenous Knowledge in Agriculture (CIKA) at Gandhigram Rural University, Tamil Nadu
- Centre for Society-University Interface and Research (CSUIR) at BPS University, Haryana

Table 2: Summary of academic programmes that can be planned in community engagement courses

Module	Module content	Teaching-learning methodology
Rural society	Rural life style, Rural society, Caste and gender relationship, Rural values with respect to community, Nature and resources, Elaboration of 'soul of India lies in villages', Rural infrastructure etc.	<ul style="list-style-type: none"> <li>- Classroom discussion</li> <li>- Field visit</li> <li>- Assignment map</li> </ul>
Rural economy and livelihood	Agriculture, Farming, Water management, Animal husbandry, Non-farm livelihoods and artisans, Rural entrepreneurs, Rural markets etc.	<ul style="list-style-type: none"> <li>- Field visits</li> <li>- Group discussions in class</li> <li>- Assignments</li> </ul>
Rural institutions	Traditional rural organisations, Self-help groups, Panchayati raj institutions (Gram sabha, Gram panchayat, Standing committees), Local civil society, Local administration etc.	<ul style="list-style-type: none"> <li>- Classroom</li> <li>- Field visit</li> <li>- Group presentation of assignment</li> </ul>
Rural development programmes	History of rural development in India, Current national programmes: Sarva Shiksha Abhiyan <ul style="list-style-type: none"> <li>- Beti bachao, Beti padhao,</li> <li>- Ayushman Bharat,</li> <li>- Swachh Bharat,</li> <li>- PM Awas Yojana,</li> <li>- Skill India,</li> <li>- Gram Panchayat Decentralised Planning,</li> <li>- NRLM,</li> <li>- MNREGA etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Classroom</li> <li>- Each student selects one program for field visit</li> <li>- Written assignment</li> </ul>

### Conclusion

In order to enable teachers to truly revamp the HE in India there is need to transform existing teachers into 21st century teachers, empowered in all the three dimensions – teaching-learning, research and community engagement. They should not merely be involved in transforming information in the classroom settings but should take responsibility of translating students into not just qualified but responsible person and contributing global citizen. This demand – rebuilding status of teachers in society i.e. 'Acharya devo bhava', so that most talented and dedicated people can take teaching as profession and put their serious efforts in improvising in teaching-learning, research and community engagement; leading to successful implementation of NEP-2020; leading to strong nation building and ultimately regaining the status of 'Vishwa Guru'.

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# NEP 2020: Administrative Challenges and Opportunities for Pharmacy



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## **Introduction**

The Union Cabinet has approved the National Education Policy (NEP) 2020 on July 29, 2020, which is an inclusive framework focusing on the elementary level to higher education in the country. A holistic and multidisciplinary education approach is the soul of the NEP, which aims for the Gross Enrollment Ratio (GER) in higher education to be increased from 26.3 % in 2018 to 50 % by 2035. All 'higher education institutions' (HEIs) shall aim to be multidisciplinary by 2040 where students of science and technology can aim to learn more arts, humanities, vocational subjects, and soft skills. The main challenge is to implement the highly comprehensive NEP 2020. There would be many opportunities for multidimensional development of the profession that we must understand for Pharmacy.

## **Structure of HEIs**

The highest recommendation of NEP is to break down harmful silos of higher education by transforming HEIs into fully autonomous large multidisciplinary clusters. It expects to phase out single-stream HEIs over time and insists all HEIs to plan to become multidisciplinary by 2030. Accordingly, all institutions offering either professional or general education will aim to organically evolve into clusters both seamlessly and in an integrated manner within a decade. Similarly, stand-alone universities like technical, health, agricultural or legal universities, and stand-alone institutions, shall aim to become multidisciplinary institutions as one coherent ecosystem of higher education. The existing institutes and universities, through the attainment of graded accreditation will gradually move towards full autonomy to enable this vibrant culture in a phased manner over a period of 15 years. The present complex nomenclature such as 'affiliating university', 'deemed to be university' shall be replaced simply by 'university'. All colleges currently affiliated to a university will eventually become autonomous degree-granting colleges. Accordingly, three categories of HEIs will emerge as – a) Autonomous degree-granting College (AC), a multidisciplinary institution that grants undergraduate degrees; b) Teaching-Intensive Universities, institutions with greater emphasis on teaching but still conduct significant research and c) Research-intensive Universities, institutions with equal emphasis on teaching and research. HEIs will have the autonomy and freedom to move gradually towards upper level if they aspire. High performing universities will be encouraged to set up campuses in other countries; similarly, international universities those from among the top 100 ranks will be facilitated to operate in India to promote peer learning and to create healthy competition.

The proposed structure is convenient to attain by existing universities and private institutions providing professional, general, and liberal education in a single campus. Moreover, such

individual institutes should practice working as a cluster. A single pharmacy institute or campus of institutes of any single discipline should start finding academic partners. Secondly, those institutes which are not accredited till date, including D.Pharm, should initiate the process as rehearsal to get converted to HEI dreamt by NEP.

### **Disciplines**

The fragmented higher education in the form of general (art, commerce, science etc.), technical (engineering, pharmacy, management etc.), health (allopathic, ayurvedic, nursing etc.), vocational and liberal arts is going to end. For example, all students of allopathic medical education must have a basic understanding of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy and vice versa. A candidate who wants to become an engineer can study music and who wants to be a pharmacist can complete E &TC.

As per NEP statement, technical education includes degree and diploma programmes in engineering, technology, management, architecture, town planning, pharmacy, hotel management, catering technology etc. However, the role of pharmacy graduates is not only restricted as technocrat; moreover, it has been comparatively more holistic than other technical streams. From inception, pharmacy graduates serve in technical areas like drug synthesis, manufacturing and testing of medicines, managerial skills like sales & marketing, project management and entrepreneurship, as well as in health care sector like clinical and hospital pharmacists. The recent pharmacy programme, Pharm. D. is completely clinical oriented. In addition, pharmacy graduates working in genomic studies, biotech and nanomedicines have increased its share in health care. Therefore, a candidate entering in science stream with pharmacy as major subject should have an equal scope to study subjects from the technical and medical stream. For that, Pharmacy council and professional bodies like IPA, APTI should keep pace with policy makers right from initial days.

### **Structure of UG and PG programmes**

The UG programme will be of either 3- or 4-year duration, with multiple exit options within this period, with appropriate certifications, viz.

- a) 'Certificate' for completing 1 year in a discipline or field including vocational and professional areas.
- b) 'Diploma' after 2 years of study, or
- c) 'Bachelor's degree' after a 3-year, and
- d) The 4-year programme may also lead to a 'Degree with Research' if the student completes a research project in their major area(s) of study.

There are two major challenges, first is design of syllabus and second is assurance of 'sufficient enrolment' in each academic year. Though the details of major and minor courses, its sequence, and duration to complete these in a year and for fulfillment of each above stage-wise degree is not clear; every stage should provide 'good package of knowledge and skills'. For example, pharmacy courses covered in certificate level should satisfy criteria to appoint the candidate as assistant in medical store or technical staff in any chemistry/biology science lab; the 'Diploma graduate' should be equivalent to D.Pharm, requirement to operate retail pharmacy/lab assistant in labs including animal experiments etc.

It will benefit the polytechnic institutes to be a part of HEI. Three-year program should fulfill criteria required for production, instrumental analysis, marketing, clinical & hospital

pharmacy, etc. Research in a particular major area of pharmacy including clinical research and drug regulations can be syllabus for 'Degree with Research'.

Second important feature of the NEP is the freedom to discontinue or re-enter at any stage of the programme and transfer their admissions to other disciplines, institutes, and universities. It can be major challenge to attract and retain students to a HEI and even for course/specialization. It will have more impact on financial feasibility of HEI and stability of faculty. Since there will not be protective cover of affiliated university, overall quality and perception created by individual HEIs will be the sole deciding factor attaining practically feasible enrolment. The existing statutory, deemed, and private universities have created some structure to attract students, however, other private institutes should initiate to conglomerate as a single HEI.

PG programmes will be of 1 or 2 years. A 2-year PG is for those who have completed the 3-year UG and 1 year PG for those completing 4-year UG. There may be an integrated 5-year Bachelor's/Master's programme.

### **Syllabus and Faculty**

NEP believes in imaginative and flexible curricular structures that would offer multiple entry and exit points, thus, removing currently prevalent rigid boundaries. Faculty will be given the freedom to design their own curricular and pedagogical approaches within the framework approved by General Education Council (GEC). Major and minor courses including vocational education will be integrated where later can be provided as Open Distance Learning or online programmes by HEIs or in partnership with industry and NGOs. Revised flexible criterion-based grading system will be adopted to assess student. Teaching in Indian languages will be promoted and proficiency in Indian languages will be included as part of qualification parameters for employment opportunities.

Teaching duties also will not be excessive, so that the activity of teaching remains pleasant and there is adequate time for interaction with students, conducting research etc. Faculty will be appointed as full time to individual institutions and generally not be transferable across institutions so that they feel committed to their institution and community. Every HEI will aim to have Artist(s)-in-Residence to expose students to liberal arts.

A multidisciplinary institute supported with senior and passionate faculty, managed by outstanding and effective institutional leadership is extremely important for managing the HEI. Leadership positions shall not remain vacant but overlapped during transitions in leadership. Further challenges include uncertain student enrollment, and thus a change in number of faculty. Therefore, a faculty should be multifaceted to get adjusted during lower enrollment situations. Secondly, institutes should employ a system to appoint faculty in prescribed numbers with right quality and at right time.

### **Students**

Students are the focus of the NEP with full freedom to select their courses, HEIs, and universities. Aspirants can select a particular HEI based on availability of disciplines of their interest. An Academic Bank of Credit (ABC) will digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded to a candidate. It is expected that the various initiatives mentioned above will also help in having larger numbers of international students studying in India and foreign collaborations can ease students exchange across the globe. The challenging part is that students admitted in first year may not

be permanent for a particular discipline or HEI. Unlike what expected for appointing full time faculty, fast-moving- graduate (FMG) may not develop feel of commitment to their institution and community.

### **Finance**

There will be common national guidelines for all legislative Acts that will form private HEIs. Private HEIs will be empowered to set fees for their programmes independently, though within the laid-out norms. There shall be no arbitrary increases in the fees during the period of enrolment of any student. NEP also states that private HEI should provide free-ships and scholarships in significant numbers to their students.

### **Regulation**

NEP states that the mechanistic and disempowering nature of the regulatory system has been rife with very basic problems. Therefore, decentralization with empowering HEI is an objective of NEP. Four independent verticals within autonomous umbrella -the Higher Education Commission of India (HECI) will work viz. a) National Higher Education Regulatory Council (NHERC) will regulate HEIs in a 'light but tight' mode, National Accreditation Council (NAC) an independent ecosystem of accrediting institutions, Higher Education Grants Council (HEGC) will be entrusted with the disbursement of scholarships and developmental funds and General Education Council (GEC) will frame expected learning outcomes, credit transfer and equivalence for higher education programmes. The National Skills Qualifications Framework (NSQF) will integrate vocational education into higher education. The professional councils like AICTE and PCI will act as Professional Standard Setting Bodies (PSSBs). PSSBs will be invited members of the GEC that will continue to draw the curricula, lay down academic standards of their domain/discipline, but these will not have regulatory role. National Research Foundation (NRF) will competitively fund research in all disciplines for that it will carefully coordinate with other funding agencies.

Upon receiving the appropriate graded accreditations that deem the HEI ready to establish a Board of Governors (BoG) for meeting all regulatory guidelines mandated by the NHERC, the institutional development plan (IDP) shall be prepared with the joint participation of BoG, institutional leaders, faculty and students.

To attain the set objectives, the policy commits to increase public investment in education to 6 % of the GDP, from the current 4.43 %. However, such transformation will require existing structures and institutions to reinvent themselves and undergo an evolution of sorts. It is expected that in the decade of 2030-40, the entire policy will be in an operational mode. Are you ready for converting challenges into opportunities?

# New Education Policy 2020 for Higher Education: Reforms, Opportunities and Challenges



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### Introduction:

The National Education Policy [NEP] envisions an education system rooted in Indian ethos that contributes directly to transforming India, that is Bharat, sustainably into an equitable and vibrant knowledge society, by providing high-quality education to all, and thereby making India a global knowledge superpower. This is in line with Government of India's various initiatives like 'Creative India; Innovative India', 'Make in India' and 'Startup India'.

The policy published by the Ministry of Human Resource Development, Government of India is broadly divided into four categories –

1. School education
2. Higher education
3. Other key areas of focus including professional education
4. Implementation of the policy

This article focuses on the higher education part with an emphasis on Pharmaceutical Education and Research. The major challenges faced by higher education institutions (HEIs) in India as per the policy are listed in table 1.

The new education policy emphasizes about healthcare and technical education.

*Healthcare education needs to be re-envisioned so that the duration, structure, and design of the educational programmes need to match the role requirements that graduates will play. Students will be assessed at regular intervals on well-defined parameters primarily required for working in primary care and in secondary hospitals. Given that people exercise pluralistic choices in healthcare, our healthcare education system must be integrative meaning thereby that all students of allopathic medical education must have a basic understanding of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH), and vice versa. There shall also be a much greater emphasis on preventive healthcare and community medicine in all forms of healthcare education.*

*Technical education includes degree and diploma programmes in engineering, technology, management, architecture, town planning, pharmacy, hotel management, catering technology etc., which are critical to India's overall development. There will not only be a greater demand for well-qualified manpower in these sectors, it will also require closer collaborations between industry and HEIs to drive innovation and research in these fields. Furthermore, influence of technology on human endeavours is expected to erode the silos between technical education*

and other disciplines too. Technical education will, thus, also aim to be offered within multidisciplinary education institutions and programmes and have a renewed focus on opportunities to engage deeply with other disciplines. India must also take the lead in preparing professionals in cutting-edge areas that are fast gaining prominence, such as Artificial Intelligence, 3-D machining, big data analysis, and machine learning, in addition to genomic studies, biotechnology, nanotechnology, and neuroscience, with important applications to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth.

## **Pharmacy education in India**

The pharmaceutical education system in India has been robust in terms of fulfilling requirement of the growing pharmaceutical industries over last few decades and has contributed significantly for the growth of the industry with quality education. Pharmacy education has traditionally been a mix of both healthcare and technical educations. Rather, it has inherently included both the healthcare [i.e., clinical] education and technical [drug engineering] education.

### **Opportunities for Pharmacy education post NEP 2020**

#### **1. Multidisciplinary education**

Pharmacy education has various disciplines ranging from basic sciences [physics, chemistry, biology], engineering [drug engineering, pharmaceutical technology, industrial pharmacy], healthcare [pharmacology, clinical, pharmacovigilance], legal [regulatory affairs, jurisprudence], technology [computer applications], life sciences [microbiology, biotechnology, biochemistry], business and the like. This provides greater ambit of opportunities for multidisciplinary education specifically at post graduate level and research level. Inclusion of technologically advanced sciences like 3d printing technologies, artificial intelligence, and machine learning would not only provide uniqueness in the education but also ensure that the pharmacy education in India can also make advancement as per the global pharmaceutical industries' requirements. Combining science with business and law is the need of the hour as scientific community has to ensure that the scientific research is not merely published but also commercialized. Domains like pharmacoconomics, pharmaceutical competition law are some examples to cite. This can be achieved in a phased manner as given below:

<b>Phase I</b>	<b>Introductory courses / Inclusion in the syllabus</b>
<b>Phase II</b>	<b>Add-on courses and hands on training</b>
<b>Phase III</b>	<b>Specialized courses in multidisciplinary domain</b>
<b>Phase IV</b>	<b>Research in the focus areas</b>

One of the major challenges for multidisciplinary education in India is the focus on competition rather than collaborations. Multidisciplinary education always need collaborations. And this has been the key area where all the government or accreditation agencies have been emphasizing

Table 1: Major challenges faced by higher academic institutions in India and solutions in NEP

Challenges	Solutions provided by NEP
A severely fragmented higher educational ecosystem	Institutional restructuring and consolidation
Less emphasis on the development of cognitive skills and learning outcomes	Optimal learning environments and support for students
A rigid separation of disciplines, with early specialisation and streaming of students into narrow areas of study	Holistic and multidisciplinary education
Limited access particularly in socio-economically disadvantaged areas, with few HEIs that teach in local languages	Equity and inclusion in higher education, Technology use and integration, Online and digital education
Limited teacher and institutional autonomy	Internationalization
Inadequate mechanisms for merit-based career management and progression of faculty and institutional leaders	Motivated, energized, and capable faculty teacher education Vocational education
Lesser emphasis on research at most universities and colleges, and lack of competitive peer-reviewed research funding across disciplines	Catalysing quality academic research in all fields through a new national research foundation
Suboptimal governance and leadership of HEIs	Effective governance and leadership for HEIs
An ineffective regulatory system	Transforming the regulatory system of higher education
Large affiliating universities resulting in low standards of undergraduate education	Quality Universities and Colleges: A new and forward-looking vision for India's higher education system

## 2. Internationalization

Internationalization of the education provides another big opportunity for pharmaceutical education. Indian pharmaceutical industry has been traditionally generic drug industry. In the recent past, most of the bigger organizations have shifted the focus to complex products, specialty products and value added products to compete with the global players. Most of the pharma organizations have global subsidiaries or collaborators or partners.

Pharmacy education on the other hand need to upgrade itself with the newer technologies, processes and quality standards. Internationalization of the education is crucial as industries, the job creators, are

globalizing and restricting the education may not be a good move. Internationalization of the education should not be merely restricted to recruiting the international faculties, but also should have inclusive syllabus considering the global dynamics and focus areas of the industry.

### **3. Faculty development**

Another area that provides great opportunity for the transformation of education is faculty development. Faculties in Indian pharmacy educational system are involved in administration, teaching, research and so many other activities simultaneously with limited opportunities to improve on various fronts. Faculty development can be achieved through simple solutions like professional development activities which need not be restricted to the scientific area. The overall development can be achieved through trainings for life skills, emotional intelligence, mentoring and management trainings. Unfortunately, the Indian education system does not provide formal trainings for the faculties for these skills which are very much crucial for their overall development and the entire ecosystem of education. Faculty development programs in these areas can be an option.

### **4. Technology use and integration and Online and digital education**

Recent pandemic has provided a big boost for online and digital education. To utilize this as an opportunity, the pharmacy education institutions need to work on hybrid education model henceforth. This is pretty possible with the inclusion of the technology and online and digital education in the current system.

With simple tools like Youtube channels, Zoom meetings, Google classrooms, the internationalization of the education is feasible through the hybrid model. The digital content generation and updation would provide better avenues to upgrade the syllabus frequently and easily. The use of the technology, specifically in the area of student projects at undergraduate levels may be implemented easily. This would provide the students with an opportunity to get used to the technology at the early stage and ensure the minimum skillset once they enter the industries. This in turn can help the students inculcate the significance of innovation and creativity with the technology tools. Going digital for add on courses or industry interaction with outside faculties may also be an option to ponder as this would help the entire education ecosystem.

### **5. Catalysing Quality Academic Research**

As the NEP outlines, 'a robust ecosystem of research is perhaps more important than ever with the rapid changes occurring in the world today'. This is aptly applicable to academic research in pharmaceutical education in India.

NEP proposes establishment of a National Research Foundation (NRF) which would involve (a) fund competitive, peer-reviewed grant proposals of all types and across all disciplines; (b) seed, grow, and facilitate research through mentoring at academic institutions, particularly universities and colleges where research is currently in a nascent stage; (c) act as a liaison between researchers and relevant branches of government as well as industry, so that research scholars are constantly made aware of the most urgent national research issues, and the policymakers are constantly made aware of the latest research breakthroughs, which will facilitate breakthroughs to be optimally brought into policy and/or implementation; and (d) recognise outstanding research and progress.

Institutions that currently fund research at some level, such as the Department of Science and Technology (DST), Department of Atomic Energy (DAE), Department of Bio-Technology (DBT), Indian Council of Agriculture Research (ICAR), Indian Council of Medical Research (ICMR), Indian Council of Historical Research (ICHR), and University Grants Commission (UGC), as well as various private and philanthropic organizations, will continue to independently fund research according to their priorities

and needs. However, NRF will carefully coordinate with other funding agencies and will work with science, engineering, and other academies to ensure synergy of purpose and avoid duplication of efforts.

This would ease out the process of grants and funding for academic institutions. Also, as in the multidisciplinary education, the multidisciplinary research would provide better avenues for funding. Pharmaceutical research has been multidisciplinary and can get benefitted with the new policy and focus on multidisciplinary academic research.

## **6. Transformation of the higher education structure**

NEP 2020 reforms also plan to implement

- Institutional restructuring and consolidation ending the fragmentation of higher education.
- Equity and inclusion in higher education by providing opportunities to socially and economically disadvantaged groups (SEDGs).
- Transforming the regulatory system of higher education by creation of the Higher Education Commission of India (HECI).
- Curbing commercialization of education with audits.
- Effective governance and leadership for HEIs

These measures are going to transform the entire education system from bottom to top providing more avenues for the institutions in terms of opportunities to change as per the requirements.

Three step approach may help the institutions to adapt the structure

- having a vision for the institute in line with the NEP 2020;
- self-assessment and identifying the weakness areas;
- execution through measurable goals.

## **7. Healthcare education**

Integrative system of healthcare combining the allopathic education with AYUSH [Ayurveda, yoga, Naturopathy, Unani] is going to provide challenges for the pharmacy educational institutions. Pharmacies have focussed on allopathic medicines for long. Including the medicines systems of AYUSH, especially in the laboratories may be challenging. However, this also provides the opportunity to create newer job avenues within these industries as these systems have not been in focus for long.

### **Disclaimer:**

All the opinions in the article are author's own and does not represent the organization he represents.

### **Reference:**

National Education Policy 2020, Ministry of Human Resource Development, Government of India available on <https://www.education.gov.in/>

# An Interview on NEP 2020 from an Academic Perspective



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Anant Paradkar is Professor and Director, Centre for Pharmaceutical Engineering Science, at the School of Pharmacy and Medical Science, University of Bradford. Anant completed his pharmacy education and worked in India for around 20 years in academics at Nagpur College of Pharmacy and Bharati Vidyapeeth, Poona College of Pharmacy. In 2008, he joined University of Bradford. His major research interests are interdisciplinary approaches to enhance understanding in crystal and particle engineering and product and process innovation. He has published more than 175 peer reviewed research papers, supervised more than 40 PhDs, and generated more than £ 4 million from funding agencies and companies. Anant works very closely with companies in the nutraceutical, pharmaceutical and medical device sectors.

**Poor GER (26.3%), skewed distribution of HEIs, poor employability of graduates, inability to achieve basic objectives like quality, equity, access and affordability, declining examination standards hence overall quality in the institutions with autonomous status are major worries of the existing education system to be addressed by NEP-2020. According to you, what are causes of this situation of Indian education system, because until and unless root-cause analysis of the existing problem is not done, how can we find the solution(s)?**

There are several factors that resulted in the current issues in the Indian education system. We have never undertaken any major reforms in last 70 years which was very obvious due to the other challenges like poverty the country had to fight. The relatively low budgetary allocation for education, high rates of population growth, challenges in the governance, lack of autonomy, and leadership were the basic issues. As discussed in the NEP, our universities with large number of affiliated colleges and rigid regulatory frameworks reduced opportunities for creativity and innovations in the education. This is the main cause that we are generating graduates with poor employability. The curriculum without defined learning outcomes, undefined assessment strategies resulted in the examination-oriented graduates instead of developing the lifelong.

Pharmacy education though has made some changes with the introduction of the PharmD programme but the regulatory framework remain to be complex with controls across two agencies for long time. Despite regulatory controls from Pharmacy Council of India and All India Council for Technical Education, the quality of the pharmacy education continued to suffer. It can be attributed to the under-resourced colleges, lack of training, and motivation for the academics and flaws in the curriculum and assessment. No doubt, introduction of the PharmD introduced good opportunity for interdisciplinarity.

**NEP-2020 advocates quality multidisciplinary universities/ colleges instead of stand-alone HEIs, inculcating 21st century skills across range of disciplines and overall holistic development of students instead of just information transfer, thereby leading to knowledge creation and nation's growth. How easy it will be to adopt this system, as the expectations of NEP-2020 demands radical changes? Further, how will the contributions from faculty and institutional autonomy help in improvising the quality of higher education?**

Development of the autonomous universities is already underway for last 15 years; I am sure this will definitely reduce the burden on the state/central universities with large number of affiliated colleges. The small autonomous universities can only provide interdisciplinary ecosystem along with high quality of governance and autonomy. It is necessary to keep in mind that in India we have number of private universities and institutions. Even after providing autonomy to many institutions, converting those into deemed/private autonomous universities, very few universities have effectively used this opportunity to achieve holistic development of the students. This demonstrates that it is a task which is easier said than done. Implementation of the multidisciplinary universities to deliver the desired outcomes will require significant reforms as you can have colleges/ departments of different disciplines on a small campus, but it is challenging to embed the interdisciplinary culture.

**Integrity of Faculty is one of the most important factors that can lead to enhance quality of education. How we can reaffirm Integrity of Faculty?**

There should be development of a suitable institutional framework and its implementation through an established board comprising academic and supporting staff and civil society members. A well-defined research concordat can be adopted in line with the international standard.

**Policy recommends special efforts for SEDGs, like instructions in local language. The generation of resource material in local language is going to be most critical to succeed in this. AICTE has already take initiatives in developing it. So, what is your opinion what initiative HEIs should take in this direction?**

The colonial impact on the education system of the country with the diversity that exists in a country like India resulted in a cultural and societal disconnect to the great extent. This is one of the reason that our investment in the education did not provide expected return on investment or benefit to the society.

**As far as the present pandemic is concerned and to increase the access and flexibility, policy recommends integration of ODL in academic programmes. What are its drawbacks and limitations? How should we make use of ODL in pharmacy education?**

ODL will provide a number of advantages to the education system overall including pharmacy. There are some limitations such as limited opportunity to impart practical skills. Considering Government of India's digital initiative, and potential of 5G roll out in next couple of years, distance learning will provide a great opportunity. The curriculum may be designed in such a way that the practical labs can be integrated as separate single module which can be delivered as per a specified schedule in the laboratories on the campus and rest can be delivered online via suitable ODL platform.

**It advocates restructuring of HEIs by end of fragmentation, bringing back India's pride, enhanced quality in teaching-learning/ research/ community engagement, autonomy through transparent and graded accreditation, increasing GER to 50% by 2035, and integrated approach (vocational-professional). What is your opinion on how this is going to increase outcomes of education and nation's growth as in whole?**

The NEP has set an ambitious target of 50% GER by 2025, achievement of this target requires an out of box approach, strategic approach from top to bottom. It is important that research and teaching should be targeted to address the needs of the country. Providing autonomy at all levels will be essential to achieve these targets.

**The major revamps recommended by NEP-2020 are credit-based courses, research internships, multiple exits, projects in areas of community engagement, services, value based education, GCED, ABC, setting up of startups, incubation centres, technology development centres, more Industry-Institute linkages, centres in frontier areas of research. Can you please elaborate on these aspects of NEP?**

Lack of flexibility in our education system has made significant impact on the development of number of young aspirants. The credit based degree programme will allow exits at different stages with certificates, diploma, degree as well as opportunity to have a placement year at the place of work, society or clinics. It is important to include the opportunity to develop the innovation and entrepreneurial qualities in the students and researchers at all the levels. The HEIs need to develop the suitable ecosystem for startups including mentoring, investment and incubation centers to take the research to the commercial level.

**Availability of quality faculty (happy, enthusiastic, motivated, energized, capable) and engagement of faculty are the 2 most critical and important factors governing success of education. How can we ensure this? What type of efforts we need to take to improvise teachers' performance?**

The solution to develop quality faculty will start from the recruitment stage. The recruitment should be based on the well-defined job description. The faculty when selected need to integrate in the vibrant, supportive work atmosphere with enough challenging and rewarding culture. The HEIs should adopt policies for merit based progression and provide support and mentoring for development opportunities. The HEIs should adopt a framework which considers all the factors including career breaks and other personal responsibilities as expected by standard HR practices. Avoid any framework which will provide stress for the early career academics in procuring funding or publication. Quality of education is considered as joint responsibility of government and HEIs.

**Phase-wise integration of Vocational Education with schools & HEIs is one of the major objectives of the NEP. What would be the advantages of integrating vocational education with school as well as higher education?**

Vocational education and skill development is one of the important aspect in the employability. One of the reason for the generation of the graduates with poor employability in the current scenario is due to lack of attention to the skill development.

**Knowledge creation & research leads to vibrant economy. Establishing NRF and promoting both quantity and quality of research is considered as priority. In particular, research in societal issues will be highly funded in future. What would be its impact on existing research setting in HEIs? What efforts HEIs needs to take to get advantage of this changing funding system as per as academic research is concerned?**

It is clear that the academics will need to develop impact-oriented research with strong scientific understanding. It is always important that impact oriented does not mean weaker

fundamental research, but it should be other way, a strong fundamental research with a well identified pathway to impact will be funded. This change in the funding strategy will be useful in achieving significant societal impact which may be commercial, environmental or a policy impact.

**According to you how important is the role of leaders to ensure Cultures of Excellence in HEIs? Effective leadership and governance is most important for the success of education system. What type of leadership can serve the purpose; can help successfully attain the objectives that NEP-2020 aims? How can we reaffirm institutional leadership? How can we develop leaderships in existing faculty so that they can be leaders of higher education in future?**

One of the major challenges in the current system is regulatory framework which does not allow evaluation of the leadership qualities of the senior as well as junior members of the staff. The academic and administrative leadership at the institutional level can be in the form of a leadership board. The identification, training and mentoring of the leader in different fields including teaching, research, equity and ethics, quality assurance and administration will be helpful to develop a strong leadership board. The existing staff should be provided opportunity for the leadership development by undertaking suitable sabbatical or academic programmes such as MBA or specialized certifications or diplomas. It is very important to provide attention and appropriate development opportunities to the early career academics. One important factor which needs to be taken into consideration is to provide equal and fair opportunity to the women, disabled, and socially deprived individuals which is essential to ensure complete representation.

# An Interview on NEP 2020 from an Academic Perspective



## Md. Salahuddin

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Md. Salahuddin completed his B.Pharm, M.Pharm and Ph.D studies from V. L. College of Pharmacy, Raichur (Karnataka) under Rajiv Gandhi University of Health Sciences, Bangalore in Pharmaceutical Chemistry Specialization. He started his professional life as a Medical Representative for Glenmark Pharmaceuticals and Bayer India Ltd, and also worked as Product Manager at Micro Labs, Bangalore where he successfully contributed towards launch of 3 new products. He started his academia life at Mesco College of Pharmacy, Hyderabad for a brief period followed by V. L. College of Pharmacy, Raichur; during this period, he completed his PhD from RGUHS. He is currently working as Professor & Principal at Farooqia College of Pharmacy, Mysore. He has also served as Asst. Professor at College of Pharmacy, Omar Al-Mukhtar University, Albeida, Libya. Dr. Salahuddin has 2 patents and 38 publications with cumulative impact factor of 13.63. He has served as Head, Examination control for Faculty of Pharmacy, Omar Al-Mukhtar University, Libya. He has chaired many sessions in conferences and also served as an evaluator. He has delivered many Invited Lectures in FDP, STTP & Career Guidance Programmes in various institutions. His major research areas are Synthetic Medicinal Chemistry, thieno [2,3-d] Pyrimidines, Antidiabetic & Anti-Inflammatory actives.

**Poor GER (26.3%), skewed distribution of HEIs, poor employability of graduates, inability to achieve basic objectives like quality, equity, access and affordability, declining examination standards hence overall quality in the institutions with autonomous status are major worries of the existing education system to be addressed by NEP-2020. According to you, what are the causes of this situation of Indian education system, because until and unless root-cause analysis of the existing problem is not done how can we find the solution(s)?**

The major root-cause for all the above problems mentioned is due to the recognition of too many state recognized universities. These universities have no control of apex bodies in particular, UGC. Permission to start new courses/programs was accorded based on mere online document submission. I do believe that until and unless strict guidelines are not implemented for violations, things may not change.

**NEP-2020 advocates quality multidisciplinary universities/ colleges instead of stand-alone HEIs, inculcating 21st century skills across range of disciplines and overall holistic development of students instead of just information transfer, thereby leading to knowledge creation and nation's growth. How easy is it to adopt this system considering that the expectations of NEP-2020 demand radical changes?**

It is very difficult to define how easy it will be to adopt this system of NEP-2020. In one way it will definitely help to improve quality of single stream institution to get upgraded to multidisciplinary Universities/Institutions (autonomous) that may have over all better impact for student's benefit, but status of good old standalone Institutions who can't get upgraded to the University/Autonomous status is not clarified in the NEP-2020. In my view, a time-line of 10-15 years will help to upgrade to multi-disciplinary HEI's. For instance,

- a) First 0-5 years to phase out/preparation activity to implement NEP
- b) Second 6-10 years to implement/transit time of NEP
- c) Third 10-15 years to fully make NEP policy functional

This will give both the Universities and the Institutions sufficient time for effective implementation of NEP.

**Faculty and Institutional Autonomy is one of the important aspects of quality education. What is your opinion on how this will help improvising quality of higher education?**

The flagship point of NEP-2020 is that it helps in fostering the unique capabilities of each student by sensitizing teachers as well as parents to promote each student's holistic development in both academic and non-academic spheres. It has flexibilities in academic program that helps student to choose their duration and path according to their capabilities. NEP-2020 is concept-based learning that helps in creativity and critical thinking amongst the teachers and students. Techno savvy teachers with outstanding research helps in innovation and generation of out-of-the-box ideas through autonomy, good governance, and empowerment, making the system more of practical and skill based. I have a mixed response to the Institutional autonomy; in one way it will give liberty to the institution to improve and carry out their quality improvement activity without any hindrance. In other way, this liberty of autonomy with no control of apex bodies/universities may result in dilution of quality. There is a need to have stricter guidelines for granting autonomy/university status

**Appropriate curriculum, engaging pedagogy, adequate student support systems and continuous formative assessments are 4 major keys suggested by NEP-2020 to optimise learning environment. How HEIs can improvise in all these 4 aspects to increase outcome of the education system? How important is the training of faculty as far as the engaging pedagogy, continuous formative assessments and use of technology is concerned?**

As per the NEP-2020, the appropriate curriculum helps the students with less stressful learning and making it more learner oriented; it enhances essential learning and critical thinking ability. The curriculum should be more of student centric, giving flexibility to students to pursue their passion and enhance their skills. Pedagogical curriculum will help to adopt more of experimental learning including hands on learning, arts-integrated and sports-integrated education. The above 4 major key aspects suggested by NEP-2020 will no doubt revive the mindset of implementation of education regulation that helps in transforming from conventional to the techno tech NEP-2020.

**Integrity of faculty is one of the most important factor that can lead to enhanced quality of education. How we can we reaffirm integrity of faculty?**

Faculty members are the main pillars of an institution. They are instrumental in protecting and promoting academic integrity on campus. As an educational leader, they have the responsibility to model and practice the values of honesty, trust, respect, fairness, and responsibility with aims of creating a culture of academic integrity for students to learn. Teachers have always been behind the scenes in imparting of quality education and academic success of the students. Nothing can replace guru, as it is said *Guru Brahma, Guru Vishnu, Guru Devo Maheshwara!*

**Policy recommends special efforts for SEDGs, like instructions in local language. The generation of resource material in local language is going to be most critical to succeed in this. AICTE has already take initiatives in developing it. So, what is your opinion on the initiatives HEIs should take in this direction?**

NEP 2020 aims to ensure that no child loses any opportunity to learn and excel because of the circumstances of birth or background. A special emphasis is on Socially and Economically Disadvantaged Groups (SEDG), which include gender, socio-cultural and geographical identities and disabilities. This includes setting up of a gender inclusion fund and also special education zones for disadvantaged regions and groups.

Children with disabilities will get an enabling atmosphere to fully participate in the regular schooling process from the foundation stage to higher education, with support of educators with cross disability training, resource centres, accommodations, assistive devices, appropriate technology-based tools and other support mechanisms, tailored to suit their needs.

HEI's will get more focused in delivery of their curriculum with impact, as regional culture plays more importance that helps in effective dissemination of knowledge that helps in more understanding, cultured and competitive pass out students.

**Considering situations like present pandemic and an aim to increase the access and flexibility, policy recommends integration of ODL in academic programmes. What are its drawbacks? How should we make use of ODL in pharmacy education?**

NEP recommendation with respective integration of ODL in academic programmes is a welcoming note. This pandemic has really taken us 5 years ahead to think and develop the academic curriculum that is more futuristic/flexible. Those days of making it a compulsion for to students to attend regular physical attendance will become a thing of the past. In my opinion, a blended mode of academic program will be the best to make education more powerful and acceptable. Having only online programmes will reduce the value of education, particularly where practical skills will be more required than theoretical. Pharmacy being a health science course, it can be best upgraded and can be made more competitive with blended mode of education, this will help to effectively bring out more powerful teaching including both theory and practical classes. Probably in a ratio of 70+30% (offline and online) will be best to cater and bring out quality in education.

**NEP advocates restructuring of HEIs by end of fragmentation, bringing back India's pride, enhanced quality in teaching-learning, research, community engagement, autonomy through transparent and graded accreditation, increasing GER to 50% by 2035, and an integrated approach (vocational-professional). What is your opinion on how this is going to increase outcome of education and nation's growth as a whole?**

Looking into the NEP's restructuring of HEI's, I do feel it will definitely enhance the quality of education. As it will give more autonomy to the institutions with graded accreditation, the single stream HEI's will get converted into vibrant multidisciplinary institutions or HEI's clusters. With this we will be talking teaching and research at undergraduate level only and not just teaching, Gross Enrolment Ratio in higher education including vocational education to increase from 26.3% (2018) to 50% by 2035 (3.5 crores new seats in HEI's) due to the integration of professional and vocational courses, this will increase literacy ratio as it gives flexibility to students to earn while learning.

However, I am worried about the utilization of autonomy by the institution. Leniency should not become dilution. I feel stricter norms for granting autonomy and running of vocational courses will decide further implementation of quality education.

**The major revamps recommended by NEP-2020 are credit-based courses, research internships, multiple exits, projects in areas of community engagement, services, value based education, GCED, ABC, setting up of startups, incubation centres, technology development centres, more Industry-Institute linkages, centres in frontier areas of research. Can you please elaborate on these aspects of NEP?**

The new revamps recommended by NEP-2020 is challenging but will have more transparent recognitions. Credit based courses are recognized internationally as it helps to keep track of students' progress, helps in transfer to another university programme while keeping in part or all previously earned credit points. Credits act as proof of previous studies when looking for a job. Research Internships are not new as it is already there with the existing educational curriculum, hence I don't see their will be much impact of implementation.

I am worried with the implementation of multiple exits; students will definitely get benefit with this implementation as they will have the flexibility of exit at any point of study year and take benefit of the same. But, when it comes to institutions, it is very difficult and even I am curious to know how it is going to help/compensate to the HEI. Its implementation, especially for degree program looks tough for HEI. As it is said in the NEP-2020 the undergraduate degree will be of either 3 or 4-year duration, with multiple exit options within this period, with appropriate certifications, e.g., a certificate after completing 1 year in a discipline or field including vocational and professional areas, or a diploma after 2 years of study, or a Bachelor's degree after a 3-year programme. The 4-year multidisciplinary Bachelor's programme, however, shall be the preferred option. If a student exits after 1 year of study, how does the institution in a 3-year programme compensate with the lost seats? The NEP needs to solve this problem.

Projects in the areas of community engagement and service, environmental education, and value-based education is already part of curriculum of many courses. Hence, this will add up more value to the NEP-2020.

Academic Bank of Credit (ABC) will help digitally store the academic credits earned by student from various recognized HEIs so that the degrees from an HEI can be awarded taking into account credits earned. The multiple exits carried out by student will definitely help him and prevent the time loss. This a good move by NEP-2020.

The present education regulations already have the policy of startups, incubation centres, technology development centres, industry-institute linkages and centres in frontier areas of research. As we all know that entrepreneurship in India is on the verge of explosive growth. Angel investors, venture capital, media, startup clubs, service providers, mentors and training companies are going to grow, incubator is the place where startups are born. NEP-2020 giving more preference to these startups and research centres will help Indians to shine globally in business.

**Availability of quality faculty (happy, enthusiastic, motivated, energized, capable) and engagement of faculty are the 2 most critical and important factors governing success of education. How can we ensure this? What type of efforts we need to take to improve teachers' performance?**

In my view availability of quality faculty can be done with the implementation of compulsory recognition of teachers based on their academic performance, communication skills, knowledge, and expertise in respective domain. Certification from the teachers training institute should be mandated to bring out effective delivery and output in performance of teachers. Today's teachers are joining profession by chance, and this has affected the quality of effective delivery of services. I believe the profession catered by choice will have best outcome in performance that benefits to all the students, organization and profession. More important, when we talk about quality of teachers, there should be uniformity in implementation of salary scales too. The ambiguity in salary disbursement has brought down the quality of education, as many teachers are living in poverty. The NEP-2020 should give autonomous status only to those institutions who effectively implement the pay scales as per the norms implemented by government from time to time.

**Quality of education is considered as joint responsibility of government and HEIs. What is your opinion about the efforts to be taken by HEIs as far as achieving of this objective is considered?**

I do believe that integrity plays a very important role in delivery of quality education. Government may have a role to monitor the effective implementation of policy of education in institutions, but it is the integrity and sincerity of HEI's that helps in bringing better quality education output. In my view, at present all state government recognized universities are not doing well, they are working more with pressure rather than pleasure. The pressure is taking them more towards the dilution of education and making a business out of education. These serious issues should be noted and attended. Institutions' are the temple of learning, there shouldn't be any influence and compromise to quality of education.

**Phase-wise integration of vocational education with schools and HEIs is one of the major objectives of the NEP. What would be the advantages of integrating vocational education with school as well as higher education?**

As I said, the pandemic has cleared more of our doubts and brought us closer to implement/integrate the vocational education in schooling and HEI's. The present education time-line is lengthier and time-consuming. Integration of vocational education like vocational education training (VET) and Career & technical education (CTE) will help students to get early into service sector as per their ability and needs as it prepares the learners for jobs that are based in manual or practical activities, traditionally non-academic and totally related to a specific trade, occupation or vocation, that helps the learner directly develop expertise in a particular group of techniques or technology. As we all know, the labor market has become more specialized, and economies demand higher levels of skill. Integration of these courses with the schools and HEI's will help more knowledgeable quality manpower for our country.

**Knowledge creation and research leads to vibrant economy. Establishing NRF and promoting both quantity and quality of research is considered as priority. In particular, research in societal issues will be highly funded in future. What would be its impact on existing research setting in HEIs? What efforts HEIs need to take to get advantage of this changing funding system as far as academic research is concerned?**

This is going to be quite challenging to implement. It is very difficult to promote and mandate quality and quantity implementation of research in existing HEI's as the present infrastructure of most of the HEI's is unfit to carry out research. Poor/lack of competitive peer-reviewed research funding across disciplines has propped up many institutions with no research. In such a case, institutions first needed to upgrade to carry out research, they need funds to establish research facilities and infrastructure, the HEI's can take advantage of this NEP-2020 clause of research establishment and funding. This will definitely help overall development of institutions with quality research. This NRF should come out with a policy of funds disbursement for all; irrespective of standard/level of institution research.

**According to you how important is the role of leaders to ensure Cultures of Excellence in HEIs?**

The role of leaders is very important in ensuring excellent performance of HEI's. Visionary leader motivates and inspires people to engage with his vision. Leaders will have an innate ability to understand their team members, define each member's goals and aspirations and bring everyone together to make a difference. In HEI, the role of head of institution is very challenging as he has to co-ordinate with the management, faculty (teaching and non-teaching), students, and parents. At times when we have the transformation of education curriculum, leader's role becomes more important. The head of organization should look into the needs of upgrading Institutional activity in multidimensional way. A dynamic, pro to development leader, takes all into confidence, and awakens faith in subordinates to bring out quality outcome in every activity of institution that helps to grow the profession, organization, faculty and students.

**Effective leadership and governance is most important as far as the success of education system is concerned. What type of leadership can serve the purpose and help to successfully attain the objectives that NEP-2020 aims? How can we reaffirm institutional leadership? How can we develop leaderships in existing faculty so that they can be leaders of higher education in future?**

In my opinion the leaders having following qualities can serve the purpose to attain the effective implementation of NEP-2020.

- A leader who can lead from the front as a role model, looks for consistency and excellence to achieve his goals and visions
- Leaders who imposes expectations and outcomes, delegates initiatives to team members so that they can share the responsibility and get serious in execution of work
- A leader who punishes for mistakes and rewards for good work done helps in setting clear goals to team members, that helps to complete the task on time

- A leader who inspires his team members by leading from the front and encourages them to achieve their goals on time.

In my view, a true leader always tries to engage in the institutional growth and professional development, organizes resources and people for predetermined objectives and outcomes, catalyzes commitment and vigorous pursuit of a compelling vision and builds enduring greatness through personal humility and professional will. He develops the successors for even more greatness in order to fill the vacuum that gets created in his absence.

I take this opportunity to thank Dr. Vandana Patravale & Dr. John Disouza for giving me an opportunity to answer Questionnaire as an academic leader.

# An Interview on NEP-2020 from an Industrial Perspective



## Vinay Thakur

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Vinay Thakur is the Founder of Mistair Health and Hygiene Pvt. Ltd., Kolhapur. He is native to Kolhapur and pursued his B. Pharm (Gold Medalist) from Karad followed by M. Pharm from UDPS, Nagpur. He has 20 years of research experience wherein he was associated with Johnson & Johnson for 14 years. He worked for 6 years with Apte Amalgamations in Mumbai as a G. M. Setup Project to manufacture Baby Care products at Kolhapur. He went on to acquire the same company in October 1999 and developed it to manufacture pharmaceutical products in 2002. His company has units pertaining to WHO approved oral liquids, semisolids, powders (oral, external) and veterinary products along with International FDA approved products. His company currently operates in contract research and manufacturing space. He has been a member of The Shivaji University, Board of College & University Development (2006-2010) and BOS (Pharma) of Shivaji University & Bharati University, Pune.

**NEP-2020 has proposed imaginative and flexible curricular structures; creative combinations of disciplines for study; multiple entry and exit points (removing currently prevalent rigid boundaries) and creating new possibilities for life-long learning. Will this enable development of human resource that industry expects?**

As far as the Indian pharmaceutical sector is concerned, India is considered as 'Pharmacy of World' wherein we consider the share of global sale of medicines, generic products and vaccines as well. This is mainly due to our capabilities to manufacture quality pharmaceuticals at cheapest costs. We, being the country with highest percentage of young population, have great potential to be 'World's Human Resource Factory' too. So, reforms in NEP-2020 are most welcome. Relevant and updated curriculum will help graduates to keep themselves updated with industrial developments. The creative combination of core subjects along with arts and sports will groom graduates holistically. Sports teaches you how to lose without losing your heart, it teaches you to be a team player. Even today people in all sectors are living in the crab effect, pulling others down. Holistic approach can bring it down.

Importantly, what is most expected by the industry is human being with his or her own thought process, which can be applied at various places in their careers. Random Brownian movement should start in an individual brain for evolution of concrete ideas. Generating confidence in asking questions and admitting when we don't know something. Mr. Swami, a senior official from J&J (from the time I used to work there), once asked me a very simple and basic query during his visit, and the very basic nature of his question shocked me then but realise its importance today. I expect graduates must possess sound, in-depth and updated knowledge of the subjects they are taught in HEIs.

They should be a Jack first, to be the Master later. It is unfortunate that no where in education, we teach them logic. Understanding the things logically and ability to apply their knowledge in everyday practice is key to the success. Example is Bernoulli's theorem and its application in moisture removal by applying vacuum during dry powder sterilization. Attitude of life-long-learning will only take them to the journey of experiences leading success.

**As part of a holistic education, students at all HEIs will be provided with opportunities for internships with local industry, as well as research internships with faculty and researchers at their own or other HEIs/research institutions. According to you, what type of benefits we will get out of this?**

Indian pharmaceutical sector is not doing much as per as research is concerned. Most of the Indian Pharma R&Ds are involved in generic product developments. While when we see the global scenario – with the present days example of ‘mixed monoclonal antibodies’ been entering into Indian market to treat COVID-19 infections; I feel academia and industry must take initiatives in leveraging research in advance branches of life sciences including molecular biology, genomics and biotechnology along with nanotechnology and other novel drug delivery approaches of small molecules. This will help both HEIs and industries to grow hand-in-hand.

**HEIs will focus on research and innovation by setting up start-up incubation centres, technology development centres, etc. Do you feel that this will help students develop their employability skills?**

To develop good start-up culture there is nation-wide collaboration of industry and academia. As pharmaceutical industries in India have history and habit of moving into clusters to take advantages of subsidies, they are populated more in certain parts of the country, while there are no pharmaceutical industries located in other parts of the nation. There is need to set up industries in all parts of the country to encourage overall development as well as employability.

By setting up start-ups and technology centres in HEIs for example pilot-scale plant which can allow hands-on experience to graduates of industrial processes including various unit operations like granulation, coating, sterile techniques etc., will help generate skilled hands.

**There is a need for bridging the industry-academia gap in today's time. What is your comment on need for development of forums where industry and academia can interact?**

Indeed, it is very much needed. But my question is – how many academic leaders approach industry? Visit industry? Interact with industrialist/ industrial experts? Unfortunately, the answer is very few. The priorities of academicians must change. Industry will not approach HEIs, HEIs needs to approach industry, if they feel that this gap needs to be bridged.

Industry institute interactions are far better in institutes of national importance, may it be IITs, NIPER or ICT and the reputed institutions in metro cities. These institutions are highly collaborated, and faculty of such HEIs are providing research consultancies too. According to my understanding, these HEIs prefer collaborations with industries with big names and they are doing great. But I appeal that they should extend their interactions with small industries located across nation, especially in rural parts of India.

Any business is always headed by people from marketing. They occupy highest position in management, and they are the only decision makers. So, instead of just communicating with technical people, academic researchers must contact marketing people to enhance collaborative efforts. And this will surely leverage collaborations with industry.

Also, pharmacy graduates are not much interested in career in pharmaceutical marketing. And this is because not much is taught during their academic career as far as pharma marketing is concerned. This is very bad. Career in marketing is most lucrative and powerful and this gap also needs to be urgently addressed. Pharmacy graduates are to be trained to opt marketing as career. They should be trained in sales promotion, strategic planning, supply chain, pharma-economics and yes in how to read balance sheet too.

Also, all the professional forums/ associations need to be more inclusive, with equal opportunities to all academic leaders/ academicians and industrial experts so that there can be greater exchange of ideas. This will help us see vibrant professional activities leading into more and better industry-institute-interactions and collaborations.

**Higher education institutions will offer vocational education either on their own or in partnership with industry and NGOs. Vocational education will be integrated into all school and higher education institutions in a phased manner over the next decade. What is your opinion about this?**

The way vocational education is developed in various branches of engineering, it needs to be developed in pharmaceutical science also. Pharmaceutical industry is involved with multiple repair-maintenance activities, including processing and analytical instrumentation maintenance e.g., AHUs, granulation, tablet compression, coating, packaging and labelling. There is an unimaginable shortage of skilled workers. Carton machines for e.g., need highly trained operators. Laundry, sales, supply chain, distribution, clinical studies, pharmacovigilance are the areas which demands vocational skills. Most of the existing efforts in developing research skills students go into product development and rarely anyone goes into process improvement. So, it is high time that we generate pharma graduates skilled in process improvisation too. Improved understanding of ever-changing technologies in all sectors of the industry is the key to decide on various disciplines in which HEIs can start vocational courses.

**The NRF will competitively fund quality research in all disciplines. Successful research will be recognized, and where relevant, implemented through close linkages with governmental agencies as well as with industry and private/philanthropic organizations. Will industry be so receptive to have collaborations with academia to do such research and implement the research outcomes of such research in industrial settings?**

Impact of research is always being considered on the basis of its commercialization potential. To transfer the research into reality, i.e., from 'bench to the bedside', always demands investment potential and collaboration with the industries can serve the purpose. Industry is always receptive of collaboration with HEIs. The major hurdle is the difference in culture in academia and industries. Many of the industries do have philanthropic cause than just profit making. My intention of setting Mistair was to make jobs available to youth of this rural part of the country. If academia and industry can work in closer association, I am sure it will not only leverage research, but will also help serve the purpose of the higher education i.e., improving quality of life and nation building at large.

### **What do students lack with respect to industry needs?**

Students from different areas of India are at different intellectual levels, possess different skills and they need to be duly trained before entering industry. Though the syllabus has changed, and it has become uniform throughout the nation due to initiatives by PCI, there are certain areas in which graduates are needed to be trained like –

- Language and communication skills
- Knowledge across all disciplines
- Exposure to new age technologies
- Technological skills including ICT
- Leadership and working in teams
- Creative thinking
- Self-discipline
- Self-initiative
- Networking beyond country's boundaries etc.

The new policy will help students to cross the boundaries of their core subjects. They can take art, language, sports, NCC as optional subject. This will groom them into all-round personalities. This is need of hour.

### **What are value systems according to you? How influential are they?**

There is a very good book called *Bottle of Lies*, that explains this concept very well. We all must refer this book. We should imbibe values in young age only. But to be honest not all schools and not all homes teach moral science. I still remember my own school Principal teaching us moral science in 1960's. The value system plays key role in your success. It guides you, it goes hand in hand with quality of life we live, it helps inculcate quality culture in the organisation we work, if not follow the organisation's culture at least. Along with the value system, courage of conviction is also very important.

FDA's data integrity issues can be easily resolved if we can imbibe 'culture of honesty' in academic settings. Simplest thing that we must start is the way how journal completion takes place in colleges. We must ensure that they have written their experiments right at the time they do experiments; checking how it is written, whether any copy-paste practice is followed? language/ grammar of writing, whether it has affected the understanding of the things been written etc. This practice will inculcate good documentation practice in graduates. Students must be trained not only to use instruments/ equipment but to calibrate them too equipment they use. They must be trained to design SOPs. Training teachers to train students in all these is most critical and important.

**What are your words of advice for the teaching fraternity of today? Thoughts on PCI initiative to send pharma teachers for industrial training.**

The process of training students must start with training the teachers. It will be a tough task to change the way teachers think. You can't become good in your field unless you have had the right teacher during your academic journey. It is high time to teach teachers – how to learn? How to have the quest to learn? Habit of asking questions. The initiatives by PCI to sponsor training of teachers in industry is highly appreciable. It is need of hour. But teachers should take it proactively. They should take the advantage of it and get themselves accustomed to the industrial practices. It should not remain merely for generating documents of training completion, with no learning.

How to transfer the knowledge they have gained, into graduates? – is again very much important. Teachers like Prof. Vandana Patravale can bring massive change, if they can keep on working on teacher's mentality and attitude.

# An interview on NEP 2020 from an Industrial Perspective



## Gargi Nadkarni

Senior Manager – Portfolio & Strategy

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Gargi Nadkarni has around 12 years of experience in IP Litigations, Portfolio and Strategy. Her role currently includes identifying robust generic products for regulated markets & 505(b)(2) opportunities. She started her career as an IP professional, where she worked hand-in-hand with R&D & outside counsel to develop effective IP strategy for generic products. Over the years, her repertoire has evolved into a rich amalgam of technical, legal, commercial & regulatory aspects of product selection and development. She has extensive experience in patent litigation, settlement negotiations & the entire gamut of Hatch Waxman activities & is an expert in shaping IP strategy. She has worked across geographies & cultures, & independently handled IP activities for business functions such as In-licensing & New Product Identification. Gargi is a qualified lawyer & has completed her post-graduation in Pharmaceutical Sciences with specialization in Drug Delivery Technology from prestigious institutes. She has received numerous scholarships & accolades throughout her educational journey.

**NEP-2020 has proposed imaginative and flexible curricular structures; creative combinations of disciplines for study; multiple entry and exit points (removing currently prevalent rigid boundaries) and creating new possibilities for life-long learning. Will this enable development of human resource that Industry expects?**

Yes, absolutely, provided implementation of the policy is done at the ground level and the reach of these innovative measures is even to the rural hinterlands.

The NEP-2020 envisages flexibility to a never seen before level in India. Multidisciplinary branches of study, flexible entry-exit points with a credit-based system will all allow students to pursue education in fields of their interest with added options of pursuing internships in the midst of the course. This, according to me, will intensify curiosity, practicality and will broaden the mind of the learner. All these values will tremendously benefit the individual, organization and nation at large.

The multidisciplinary approach is very interesting, particularly for me, as it is a very forward-looking concept. I can only imagine the employment and entrepreneurial opportunities available to a student majoring both in Pharmaceutical sciences and Artificial Intelligence for example!

**NEP-2020 advocates 'graduate-level, master's and doctoral education in large multidisciplinary universities, while providing rigorous research-based specialization providing opportunities for multidisciplinary work in collaboration with industry'. Do you feel this can really aid improving employability of graduates?**

Certainly! I am looking forward to the implementation of the National Research Foundation as envisioned by the NEP-2020. This will not only bolster innovation but will uplift the general status of R&D in the country. Right now, not many pharmaceutical companies are investing into R&D. This is the disconnect between academic institutions and industry where we see good research being done at the academic level, but that does not translate into industrialization of the technology. Hopefully, with the entry of a dedicated government initiative to promote research, industry will be made an important stakeholder in this initiative. If we look at countries that invest hugely into R&D such as Israel, USA or South Korea, we see that Industry is an active stakeholder into research projects. The USA is a great example where we have seen numerous drug discovery programmes of Universities being converted into commercial successes by Industry. USA introduced the Student Apprenticeship Act which basically introduced a tripartite arrangement between industry, student and the educational institution. We need something similar in India. Even the NEP doesn't, by law, make the industry a compulsory participant as of now.

**As part of a holistic education, students at all HEIs will be provided with opportunities for internships with local industry, as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability. Will that help industry in troubleshooting the problem that it faces?**

Right now, when the industry employs students as freshers, they have only theoretical knowledge. Industry needs to invest resources into training of the individual so that he/she can engage into their work efficiently. If this training becomes a part of the curriculum during graduation or post-graduation coursework, this will not only save the time and resources of industry but will also increase the employability of students. On an individual level, students will be more prepared to handle the challenges that are presented to them in their professional lives.

**HEIs will focus on research and innovation by setting up start-up incubation centres; technology development centres; centres in frontier areas of research; greater industry-academic linkages; and interdisciplinary research including humanities and social sciences research. Do you feel this will help leverage research that industry takes and help students develop their employability skills?**

Absolutely! As I mentioned earlier, there are no boundaries for opportunities presented by a multidisciplinary study as laid out by the NEP-2020. This will encourage not only employability but opportunity creation. I also feel students should be taught skills like how to monetize one's idea, regulatory hurdles in entrepreneurship, raising funds for one's start-up, etc. Industry greatly benefits by licensing or acquiring new technologies and start-ups will fund a majority of such opportunities.

**Higher education institutions will offer vocational education either on their own or in partnership with industry and NGOs. Vocational education will be integrated into all school and higher education institutions in a phased manner over the next decade. Focus areas for vocational education will be chosen based on skills gap analysis and mapping of local opportunities. MHRD will constitute a National Committee for the Integration of Vocational Education (NCIVE), consisting of experts in vocational education and representatives from across Ministries, in collaboration with industry, to oversee this effort. What is your opinion about this, will that really help HEIs to develop various technical and social skills in the graduates? Are there any skill sets in your mind related to pharmaceutical field that every graduate should have? Do you suggest any such certificate/ diploma/ PG diplomas etc. courses that pharma academia should start to bridge the gap between what academia produces and what industry expects?**

Imparting relevant vocational training will certainly help the industry in identifying the right talent. As I mentioned earlier, currently the industry undertakes a lot of the training aspect once a fresher joins the industry. The employee will learn 'on the job' which is both time consuming and prone to errors. Sometimes this gap also becomes too difficult for the fresher to breach when he/she is employed, leading to repercussions. This may be avoided by imparting specific vocational training at college level itself.

Specifically for pharma, students may be imparted with skills that teach product development as per industry requirements, regulatory requirements of different markets, marketability or valuation of products, innovation and patentability, business aspects of decision making, handling of laboratory and plant equipment and troubleshooting, etc.

I think academia should impart vocational training to students on above mentioned topics and specifically provide certifications through industry-based professionals or trainers. This will immensely help academia, students and industry and raise the bar of students that graduate every year.

**The NRF will competitively fund research in all disciplines. Successful research will be recognized, and where relevant, implemented through close linkages with governmental agencies as well as with industry and private/philanthropic organizations. NRF will act as a liaison between researchers and relevant branches of government as well as industry, so that research scholars are constantly made aware of the most urgent national research issues, and so that policymakers are constantly made aware of the latest research breakthroughs; so as to allow breakthroughs to be optimally brought into policy and/or implementation. Will this be improving quantity and quality of research undertaken in HEIs? And will industry be so receptive to have collaborations with academia to do such research and implement the research outcomes of such research in industrial settings?**

NRF will be an important connection between academia and industry. As mentioned earlier, we should incentivise a system similar to Israel or USA with dedicated innovation centres that help in identifying relevant research opportunities, connect academia with industry for proper funding and also help in protecting smaller researchers by securing patents for the research. It will be important that NRF plays an active part in such collaborations rather than the passive

role played by existing government research funding agencies. Industry will obviously be receptive to relevant technologies and products that are commercially viable.

**Technical education will also require closer collaborations between industry and higher education institutions to drive innovation and research in these fields. Will industry be open for such closer collaboration to drive research and innovation? Which areas of research in pharmaceutical sector should be taken as priority?**

As I mentioned earlier, sometimes research carried out in India is not relevant to the industry or maybe too futuristic. Hence such research may not be commercialized. The need of the hour is to invest in research that caters to the industry thought process whilst maintaining high standards of innovation. India is on the brink of catapulting as a global pharmaceutical leader and in order to do that, we must balance innovation with scalable technologies that can be marketed with batch reproducibility.

I think we need to conduct research on India specific health requirements such as diabetes, oncology, infectious diseases such as malaria, tuberculosis and hepatitis, biotechnological products, etc. A great example of how multidisciplinary approaches can be used to manage diseases is the development of smart devices delivering insulin that with the help of sensors can better manage continuous glucose monitoring, thus improving health outcomes.

We, as researchers, should speak to clinicians and hospitals on what the unmet need is for a particular therapy and determine what patients would greatly benefit from. We should then devise solutions to these problems that are ideally simple, cost-effective and scalable. This approach of keeping the solutions patient-centric will benefit doctors, patients and industry alike.

## **Employability**

**As part of a holistic education, students at all HEIs will be provided with opportunities for internships with local industry, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability. Do you really feel that these steps that HEIs may take will increase employability potential of higher education programmes?**

Yes. Internships give students an insight into what really happens in the industry. Getting to do projects in various departments will also help students take smart decisions on their career interests. Thus, internships will certainly help increase employability.

**Education must build character, enable learners to be ethical, rational, compassionate, and caring, while at the same time prepare them for gainful, fulfilling employment. How important are the ethics and value systems in your opinion? What should be included in the education system to inculcate values, life-long-learning attitude, well developed ethical, rational, social character in graduates?**

Values are of utmost importance in one's personal as well as professional life. Society, in general, gives a lot of importance to the personality of the individual than to the character of the individual. Secondly, we as pharmacists are indirect healthcare providers, thus having well-rounded professionals will create a better healthcare system. An ethically driven individual will also give more importance to the organizational goals rather than his individual goals, thus creating a more balanced system. Ethical companies in turn create products where quality is of primary importance as much as profits.

**How are the cutting-edge technologies like AI-ML, big data analysis, 3D machining revamping pharmaceutical sector? And as per the academic point of view, what initiatives we should take to develop human resource that can enhance use of these cutting-edge-technologies as well as can deal with the disruptive nature of it?**

Machine learning and Artificial Intelligence are the future of every industry existing today. Many top pharmaceutical companies have started leveraging the use of AI in their business to reduce costs and improve outcomes. AI and data analysis are being used in computer aided drug design, improvement in clinical trial outcomes, better diagnosis of the disease, pharmacovigilance, predicting ways to reduce wastage during manufacturing, etc. Use of AI can thus make processes better, read data quickly, predict outcomes efficiently and thus reduce costs. These skills should be imparted to students who can help develop efficient programs specifically for the pharma industry. While the AI revolution is disruptive, it also allows doctors, workers and management to focus on other problems and on ways to innovate rather than spending time on reading data, interpreting it and predicting the outcomes manually. AI will become an indispensable part of the pharmaceutical industry in the future, and we will need to learn skills enabling us to use it more effectively.

# An Interview on NEP-2020 and Examination Reforms



## B. M. Hirdekar

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B. M. Hirdekar is one of the rarest academic leaders, a true blend of sincere academician and skilful administrator. He has a postgraduate degree in English and a degree in law with specialisation in labour laws. He then completed his Ph.D. in University Administration. He had undertaken several administrative positions including the Controller of Examination, Shivaji University, Kolhapur; Registrar, D. Y. Patil University, Mumbai; Senior Executive Administration, Symbiosis, Pune; Registrar SGU, Kolhapur; Deputy Registrar, Shivaji University, Kolhapur and Principal, Mohite Patil College, Rahimatpur. He has a teaching experience of more than 15 years in junior and senior colleges and more than 7 years in schools. He had instrumented various ICT driven initiatives in conducting examinations while working as a COE. He has delivered more than 1000 lectures on various important topics including quality of education, parent education, personality development, leadership etc. His social work through NSS programmes and active participation in 'Reading Moment' is very well appreciated. He has published many books and book chapters including a poetry book called 'Ruturang'. He has published and presented many research papers in journals and conferences of repute. His talks on literature and education are broadcasted on radio. Presently, he is serving as a stakeholder in education as a consultant in quality education, administration, and management and also offers counselling in lifestyle management, career, and menace of copying in examinations, to name a few.

**One of the most highlighted drawbacks of today's examination system is emphasis on rote memorization. NEP-2020 advocates formative assessment, involving scientific, continuous, comprehensive testing, learning, and conceptual understanding. These examinations would test achievements of basic learning outcomes through assessment of core concepts and knowledge from the national and local curricula, along with relevant higher-order skills and application of knowledge in real-life situations. How will this system of evaluation be useful to enhance quality of Higher Education? How much is this important as far as graduates' progress in his life is concerned along with nation building?**

Formative assessment system suggested in NEP 2020 is not a new system. We have been using it and it is being practiced in the schools and colleges. The problem is that the existing assessment tools, assessment styles, assessment approaches are not appropriate. For instance,

- Measurement and evaluation of education outcome is at the end of teaching-learning process.

Instead of learning-teaching, relearning (if not learnt properly) re-teaching or remedial teaching doesn't happen simultaneously.

Hence, reforms in evaluation suggested by NEP 2020 recommend that – ‘the evaluation needs to be scientific, continuous and comprehensive’. All these words are important, and they have special purpose and meaning. In outcome-based learning and teaching, whatever is taught is supposed to be learnt by the students. In existing situations this is not a reality; it is teacher’s assumption.

**a. Scientific:** Scientific measurement means:

- Whatever was supposed to be evaluated, is evaluated.
- Whatever is evaluated, is properly evaluated.
- It is evaluated with reference to the weightage given, and
- It is evaluated and reflected visibly in the competencies, knowledge level, skills and attitudinal change of the students.

**b. Continuous:** Continuous assessment literally means that the student is continuously under assessment, formally and informally. It is not at the end of a semester or year but throughout the year and throughout the course. It usually covers:

- Classroom assessment
- Assessment through formal lab courses and practical
- Through presentation and submission from time to time
- Assessment through projects
- Behaviour assessment judged through study tours, co-curricular activities, extracurricular activities and meaningful interactions

**c. Comprehensive:** Comprehensive assessment means holistic assessment. Here we have to think about the different domains of learning and those are – cognitive, affective and psychomotor. It aims at all the aspects of development of the students, touching all the levels of learning. This all refers to Benjamin bloom's Taxonomy and Howard Gardner’s multiple intelligence ideas.

In our routine teaching and learning, generally majority teachers teach and complete their job and that is the end of the process from teacher’s point of view. But the important part is after the teaching is over, we have to assess the learning outcomes. What is really learnt, what the student has achieved, in what ways his abilities and competencies are strengthened and what still needs to be improved further.

While doing this, the teacher has to keep in mind that all the learners in the class generally categorized as slow learners, good learners, clever learners, average, brilliant as well as exceptionally brilliant learners, need to be attended. In majority universities, faculties hardly keep in mind these categories of students while setting question papers.

**The concept of Academic Bank Credit (ABC) recommended by the NEP-2020 allows students to leave a course and join it after a certain time from where they have left it. Through ABC, the movement of students within a university, implying from one course to another and across universities from one institute to another, will also be possible. UGC have already taken steps to implement it. What is this concept actually? And how this is going to be implemented?**

The University Grant Commission (UGC) has set up Academic Bank Credit, which has the following features:

**a. Virtual Entity to keep record of all students in higher education in India**

- Aims student mobility from one institute to another
- Allows multiple entry and multiple exits
- Certification after a period
- Storehouse of credits earned by a student
- National Academic Depository

**b. Commercial bank with student customers**

- Offers services to students, who can open an account and will be given a unique ID
- Institutes will deposit the credits in the respective accounts

**c. Role of ABC**

- Opening, closing, and validating the academic accounts
- Credit verification and credit accumulation
- Credit transfer and redemption of students

**d. Promotion of ABC**

- Applicable for all courses including online and distance education courses.
- Validity period will be for 7 years.
- It may vary on subject/ discipline.

**e. Impact:**

- Institutes have to amend rules to build a degree as per choice.
- Credits up to 50–70 can be completed in one Institute and 30–50 in another Institute.
- UGC will ensure that minimum credits required are completed.
- Institutes are bound to participate in this or else they will be penalized.

Credit Bank is going to help the students in many ways. Horizontal mobility of the student which is now restricted by the age-old problem of equivalent degrees in different colleges, will be solved at least by 90%. The credits earned by the student will remain in his or her account for a certain period. ABC will be helpful for flexible vertical and horizontal mobility of the student in the country and to some extent abroad also.

Working population of students who change locations due to the job transfers or change in workplace find it difficult to take admission. They will be able to continue with the credits already in their accounts, and the progression of the students will go ahead uninterrupted.

Working male/ female, unmarried female/ married housewives who have a gap in education in between the course, usually drop out from the course. Such dropouts in higher education are considerable and affect the overall GER of the country. ABC will reduce this problem.

Several cases pertaining to fake degree documents, certificates, mark lists are pending before the courts in India. ABC will be the National Level Authentic Repository, collecting data directly from the HES and can control such fraudulent activities.

**Exam Reforms 2018, by AICTE recommends the use of scoring rubrics as an assessment tool, open-book examinations and other means for continuous assessment of students' progress. How is this AICTE policy going to be useful as far as progress of higher technical education in India is concerned?**

The reforms suggested by AICTE, whether scoring rubrics or open book examinations, are essential tools. It is useful not only to assess knowledge gained by graduates but also the soft skills, professional skills and competencies.

They measure not only achievements of teaching-learning process but the desired outcomes too. The assessment drives learning outcome-based education, performance-based approach and Washington Accord which evaluate the knowledge gained and higher order abilities including ability to apply knowledge, solve complex problems, analyse, synthesize and design. Professional skills and competencies include ability to communicate, working in team, lifelong learning, etc. To assess all these outcomes, AICTE suggests various modes and tools of assessment like – term papers, problem-solving assessments, projects, lab work with innovative experiments, and real-life experiences/ tasks.

AICTE has recommended (i) Alignment of assessment with learning outcomes, (ii) Levels of expected cognitive learning and (iii) Assessment method to be adopted. Unfortunately, these three aspects are not well coordinated and synchronized with symphonic thinking.

AICTE has suggested the use of a Rubrics system. It is a powerful measuring/ grading tool for assessment and grading the student work. This Rubric can serve as a transparent and inspiring guide to learning.

Open book examination suggested by AICTE is another novel way to assess outcome of teaching-learning process. It is less stressful and can test higher order thinking and synthesizing skills. But the reference material has to be carefully chosen. Further, the time for the test should be allocated as per the nature of the problems or questions to be solved and their difficulty levels.

AICTE has thoughtfully designed the complete scheme of open book examinations in a holistic nature, depicting a global and futuristic approach. It is an excellent document on exam reforms and is followed in most of the engineering colleges and to some extent in business schools. However, all other disciplines, especially arts and social sciences, are still not aware of this well thought approach.

The outcome-based education philosophy and the principles behind it make our objectives scientific. It can be adopted in all the disciplines of knowledge with scientific changes.

**There are numerous challenges to conducting online examinations, including limitations on the types of questions that can be asked in an online environment, handling network and power disruptions, and preventing unethical practices. How are we going to address these challenges?**

With online education we are now adopting the mode of online assessment. Now this has become a need of the hour.

From the technology point of view, conducting online examinations on any platform is basically digitizing the assessment system. Good connectivity/ bandwidth, good platform(s), ICT infrastructure, and all related things must be taken care of very systematically. Adequate support from a data centre and an alternate plan B has to be put in place in case of technical glitches. The other important part is the philosophy and psychology behind such an examination system.

Objective testing in terms of online multiple-choice questions (MCQ) is a quite common and have some plus and minus points associated with them. Actually, setting a good MCQ question paper is a big intellectual challenge. Mostly in such exams, memory testing only is addressed. Various types of questions including fill in the blanks, matching the pair, completion of sentences or series and many approaches aimed at testing the knowledge gained, application of concepts, logical and analytical thinking including creative, innovative, and lateral thinking should be adopted. However, question paper setting of MCQs in many university/ college systems is taken very casually.

**The National Testing Agency (NTA) will work to offer a high-quality common aptitude test, as well as specialized common subject exams in science, humanities, languages, arts, and vocational subjects, at least twice every year. The high quality, range, and flexibility of the NTA testing services will enable most universities to use these common entrance exams - rather than having hundreds of universities each devising their own entrance exams. What is your opinion on this sir, will that be beneficial for students and or higher education institutes? Will that promote merit? Will that be useful to avoid unethical practices during the entrance exams?**

National Testing Agency (NTA) offering a high-quality Common Aptitude Test as well as specialized common subjects exams will be a premier, specialist and autonomous body. It will be the most appropriate body to organize/ conduct all entrance examinations. The students will be assessed for the competencies required for the respective courses.

This agency will create a 'Question Bank' for all subjects. They will have a pool of experts from different disciplines including national and international experts. NTA will offer quality testing services and will guide colleges and universities. They will also empower boards and schools to go for quality testing.

However, the Centre/ Public state coordination has to be proper for implementing a common test for all. For instance, when the NEET exam was introduced, there were many suits filed in the supreme and high courts by many stakeholders. So, absence of a good authority to conduct such entrance exams, and giving liberty to state governments, and other state private

universities will create confusion and chaos. To go for practical solutions and make students and parents stress free and to save their money on so many exams, NTA has to co-ordinate with all regulatory councils such as MCI, BCI, AICTE, COA, PCI and UGC. Together they can approach the Central Government, Ministry of Education and State Governments and Boards.

Grades/ scores achieved by the students and their equivalence can be normalized under the guidance of NTA and they can be accepted across the states. This will relieve the students from the harassment of appearing for so many exams for one particular course.

Conduction of examination has become a big business; students are unnecessarily exploited with the examination dates and timetables overlapping. Students miss a lot of opportunities to enter in a good institute. NTA can bring all the concerned stakeholders together and with their expertise, more transparent and proper examinations and just assessment can be ensured.

**Such entrance exams will test conceptual understanding and the ability to apply knowledge and aim to eliminate the need for taking coaching for these exams. What will be impacts of this, according to you sir?**

For conduction of any online examination, an institute must have thoughtfully prepared a question bank. By thoughtfully I mean –

- Considering the students' ability and understanding level in a particular class or mass or general categories of students as per their intelligence level
- Difficulty level of questions as the above types
- Weightage of question, given to chapters
- Coverage of syllabus and keeping in view of the learning objectives

The selection of experts for paper setting and their experience, expertise and integrity is also very important. There needs to be a judicious, balanced mix of question types along with objective MCQs like short answer type questions, long answer type questions and open-ended questions. And obviously, the answer keys with model answers should be provided.

# An Interview on NEP 2020 and Examination Reforms



## Krutika K Sawant

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Krutika K Sawant is the Head, Pharmacy Department, (since 2 May 2017) and Dean, Faculty of Pharmacy (since Oct 2019), The Maharaja Sayajirao University of Baroda, Vadodara. She obtained her B. Pharm, M. Pharm and Ph. D. from The M S University of Baroda. Her broad area of specialization is Formulation and Development of Controlled and Novel Drug Delivery Systems. She has more than 33 years of Teaching and Research Experience. She has 1 Indian patent granted, 5 book chapters, 110 publications and nearly 80 paper presentations. Prof. Sawant has 4164 citations with h-index of 34 and i10-index of 72. She has guided 25 Ph. D. and 82 M. Pharm students. She is a reviewer for more than 25 Scopus Indexed peer reviewed International Journals. She is a Member of Board of Studies in Pharmacy and Faculty Board of MSUB and few other Universities. She has acted as a resource person for various seminars, workshops, conferences, and staff development programmes. She is a Member, Research Monitoring Committee / Doctoral Advisory Committee for GTU, Nirma University, CHARUSAT University, Dharamsinh Desai University, Parul University, etc. She has also acted as Examiner for B. Pharm, M. Pharm and Ph. D. courses at various colleges and Universities.

**One of the most highlighted drawbacks of today's examination system is an emphasis on rote memorization. The NEP-2020 advocates formative assessment, which is scientific, continuous, comprehensive testing learning/ knowledge/ conceptual understanding. These examinations would test achievement of basic learning outcomes by assessing core concepts and knowledge from the national and local curricula, along with relevant higher-order skills and application of knowledge in real-life situations. How this system of evaluation be helpful to enhance the quality of HE? What do you feel, how much this is important as per as graduates' progress in his life is concerned along with nation-building? What types of examination systems are existing in the Maharaja Sayajirao University of Baroda? Are they matching with systems that NEP-2020 recommends? How exactly this examination system going to be?**

*i. How will this system of evaluation be useful to enhance the quality of HE?*

In my opinion, it is a long overdue and pressing need that our Indian education system should do away with the rote memorization-centered assessment of student's grasping, understanding, and comprehension.

NEP-2020 rightfully stresses upon scientific, continuous, and comprehensive testing of learning/ knowledge/ conceptual understanding. HEIs need to evolve examination systems aimed to test the achievement of basic learning outcomes.

Once this system is in place, the student will be weaned off from the conditioned memorization and gravitate towards conceptual awareness, understanding, and application-based learning. This will produce undergraduates, graduates, and postgraduates who will efficiently apply the knowledge gained through effective learning in applications, improvisations, and innovations, thereby contributing towards nation building.

*ii. What do you feel, how much is this important as far as a graduate student's progress in life is concerned along with nation building?*

The primary purpose of education is to facilitate learning, acquisition of knowledge, skills, values, morals, beliefs, and habits and proper assessment criteria only can help us to judge whether a student has been thoroughly/properly educated or not. This is only possible by employing continuous assessment tools designed to fathom the students' extent of learning and conceptual understanding. The key is to slowly and steadily impart education and skills so that they remain ingrained in the student and are forgotten after an examination, as usually occurs in rote learning-based system.

Such “truly” educated youth will be confident, knowledgeable, and productive, all contributing to Nation Building.

*iii. What types of examination systems are existing in the Maharaja Sayajirao University of Baroda?*

The Maharaja Sayajirao University of Baroda has 14 faculties, 3 constituent colleges and 89 departments, conducting 98 PG courses, 66 Ph.D programmes, 39 PG Diploma courses and 88 UG courses offering 347 programmes in 92 subjects with more than 37,295 enrolled students.

With so much diversity, different patterns of assessment and examination exist for various programs offered by the University, including a marking system, direct and indirect grading system, wherein two components are included, viz Internal assessment and University (External) Assessment. Internal assessment is done by the subject teachers via continuous evaluation employing various assessment tools (tests, assignments, seminars, quiz etc.) whereas end semester examinations are conducted by the university following the guidelines decided by the respective board of studies.

*iv. Are they matching with systems that NEP-2020 recommends?*

The University has started initiating a string of exam reforms by proposing to give more weightage to continuous evaluation and a lesser emphasis on Final/End semester exam. The Syndicate, the policy making executive body of the university, has approved this proposal, and many programs have already started implementation after due approval from the respective Board of Studies.

*v. How exactly is this examination system going to be?*

The exam system as envisaged by the NEP 2020 should be able to assess the learning outcomes, including in-depth learning and mastery of curricula, critical thinking, and higher-order thinking capacities and problem-solving abilities. More emphasis would be given to continuous and comprehensive evaluation rather than end semester / final examinations. The assessment methods must be scientific, designed to improve learning and test the application of knowledge continuously. Evaluation criteria would also be focused on communication skills, discussion, debate, research, creativity, and innovation. The assessment system would be a fairer, more comparable, and criterion-based grading system that will assess the student based on the learning goals.

**The concept of Academic Bank Credit (ABC) recommended by the NEP-2020 allows students to leave a course and join it after a specific time from where they have left it. Through ABC – the movement of students within a university, implying from one course to another and across universities from one institute to another – will also be possible. UGC has already taken steps to implement it. What is this concept actually?**

According to UGC definition, “Academic Bank of Credits (ABC)” is an academic service mechanism as a digital/virtual/online entity established and managed by MOE/UGC to facilitate students to become its academic account holders and paving the way for seamless student mobility between or within degree-granting Higher Education Institutions (HEIs) through a formal system of credit recognition, credit accumulation, credit transfers, and credit redemption to promote distributed and flexible teaching-learning.” It is a student-centric initiative that will enable multiple entry-multiple exits as well as anytime, anywhere, and any level of learning aimed to suit their aptitude and knowledge thirst, freedom to choose, change their academic directions and domains at their own without boundaries of area, region, specialization or time.

*i. And how is this going to be implemented?*

The UGC has published draft Regulations in Jan 2021, providing guidelines for the establishment and operationalization of ABC. ABC shall be established on “National Academic Depository” as a Special Purpose Vehicle (SPV). Accordingly, ABC will be a digital/virtual/online store-house of credit database of HEIs with students as its stakeholders with a dynamic website. It shall operate as a financial bank with students as account holders to whom the ABC shall provide a variety of services, including credit verification, credit accumulation, credit transfer/redemption, and degree authentication. In simple terms, students can open a unique/individual academic bank account in digital form with a unique id and standard operating procedure (SOP). In this account, credits awarded for various courses pursued by the student in HEIs will be deposited.

One constraint here is that UGC mandates that Universities and Autonomous/Affiliated Colleges should be accredited by National Assessment and Accreditation Council (NAAC) (or any such body to be recognized in the future), at least at ‘A’ grade level, to get registered under the ABC Scheme. HEIs are awaiting clarity in the matter and Gazette notification before finalizing its implementation policy and procedures.

**Exam Reforms 2018, by AICTE recommends Using Scoring Rubrics as an assessment tool, open-book examinations, and other means for continuous assessment of students’ progress. How will this AICTE policy be useful as per the progress of higher technical education in India?**

AICTE has rightly observed that written examinations assess a minimal range of student learning outcomes and cognitive levels for which there is a need for reliable methods and proper assessment tools. The tools recommended by AICTE are highly relevant for technical and professional courses in the context of NEP 2020.

The primary purpose of rubrics is to assess performances including, oral communication, work habits, written skills, reports, term papers designed to demonstrate understanding of concepts. Rubrics are not evaluative but are descriptive and help to match a student’s

performance to the description rather than "judge". In addition, they help the students to understand the learning target and criteria for success.

But they depend on standards, curriculum goals, instructional goals and objectives, and the indicators of learning outcomes used for assessment.

Open-book exams test students' ability to find and apply information and knowledge. In an ideal OBE, teachers can devise questions that require students to answer in more analytical and critical ways, thus encouraging high-order thinking skills in students compared to closed-book or traditional exams. An Open Book Examination allows analytical thinking and discourages rote learning. It tests students' ability to quickly find relevant information and then to understand, analyze and apply knowledge while thinking critically. OBE also motivates the students to locate, apply, and use information.

The main issues with open book exams is that teachers may not know how to develop and devise effective exam questions that require students to apply their knowledge through analysis and critical thinking; On the other hand, students may falsely assume that the exam will be easy, and they will be able to find all the answers in the textbook or on their memory aid.

Despite of their few shortcomings, the higher-order assessment tools recommended by the AICTE are definitely going to contribute towards more effective teaching, learning and assessment outcomes.

**There are numerous challenges to conducting online examinations at scale, including limitations on the types of questions that can be asked in an online environment, handling network and power disruptions, and preventing unethical practices. So how are we going to address these challenges?**

During the past year where we were forced to adopt online teaching, learning, and evaluation tools, we all educational institutions have faced and have learned to overcome many challenges associated with online examinations. Teachers, Computer and IT support teams, and Exam section personnel have all worked together to systematically face and find solutions to various problems faced by examiners and examinees.

We found that we can conduct exams not only through MCQs but can also use so many other means of evaluations and assessment, which probably we were not adopting during off-line, traditional-type assessments.

Of course, the problem of poor network connection or power disruption at the examinee's end can't be controlled, but the exam/computer center is equipped with a generator and suitable backup facilities to take care of such situations.

As far as preventing unethical practices are concerned, we have adopted various techniques like video recording while appearing for the online exam or using proctoring tools during internal exams.

For the end-term exams, our University has developed and adopted AI-based anti-cheat, remote proctoring systems that can monitor eye movements, keystrokes, record screens and track searches as well as home environments and physical behaviors of the examinee. Furthermore, students are monitored by Jr. and Sr. supervisors who report suspicious cases to the vigilance squad.

**The National Testing Agency (NTA) will offer a high-quality common aptitude test and specialized common subject exams in the sciences, humanities, languages, arts, and vocational subjects, at least twice every year. The high quality, range, and flexibility of the NTA testing services will enable most universities to use these common entrance exams - rather than having hundreds of universities each devising their own entrance exams. What is your opinion on this? Will that be beneficial for students and or HEIs? Will that promote merit? Will that be useful to avoid unethical practices during the entrance exams conducted by various HEIs?**

I feel that this is a very good move on the part of the NTA. This will reduce a large number of exams and entrance and aptitude tests that students have to go through for securing admissions across India, reducing their stress and allowing them to focus on an all-inclusive single National Level exam. Furthermore, it will also bring parity in the results and allow the preparation of a fair and inclusive single merit list, which can be used for any course in any college or university for admission purposes, which will ease out the complex and often lengthy process of admissions for the HEIs. It will definitely be successful in curbing the unfair and often rigged admission procedures adopted by many unscrupulous private / self-financed institutes/colleges to lure students to their campuses.

**Such entrance exams will test conceptual understanding and apply knowledge and aim to eliminate the need for taking coaching for these exams. What will be the impacts of this, according to you?**

A well-planned and executed mechanism of testing the learning outcomes, aptitude, skill sets, understanding, and conceptual clarity of the students is definitely going to make the need of coaching classes redundant and unnecessary. This will not only save a student's time and money but allow the student to sharpen his/her brain, promote grasping, understanding, and evaluative plus applicative learning. On the whole, this will boost the student's confidence, academic and all-round growth, which in turn will contribute to Nation Building.

**Any other suggestions you might have.**

The NEP 2020 is indeed a path-breaking regulation that will most certainly improve the teaching, learning, and assessment process significantly and ensure knowledge enrichment, skill enhancement, and independent thinking abilities of the students.

HEIs need to design strategies aimed towards efficient and effective implementation of the NEP 2020. To do that, HEIs would require autonomy to innovate on matters of curriculum, pedagogy, and assessment

For this, regulatory bodies need to provide freedom, flexibility, and academic autonomy. Currently, pharmacy education is strictly regulated at all levels by the Pharmacy Council of

India, right from syllabi, to assessment and examination pattern, leaving no scope for the HEIs offering various pharmacy courses to properly implement the NEP 2020.

For the implementation of ABC also, approval by PCI will be required.

Through this platform, I earnestly call upon the think tank of the PCI to re-look into the various education regulations from the perspective of NEP 2020 and pave the way for effective implementation of the NEP 2020 in pharmacy education in India!

# An Interview on NEP 2020 and Examination Reforms



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R. Sudeendra Bhat is Professor of Pharmaceutics at JSS College of Pharmacy, Mysore. He has over 24 years of teaching and research experience. His areas of interest include management sciences, industrial management, quality assurance, regulatory affairs & designing, developing and testing of polymeric drug delivery systems. He has several publications and presentations to his credit. He has developed good liaison with various pharmaceutical industries in the country and has undergone hands-on training on different aspects of pharmaceutical industry. He delivers personality development and soft skills development lectures on topics like communication skills, memory techniques, interpersonal relationships, body languages, etc. He has delivered several invited lectures on pharmaceutical management, pharmaceutical industry and has participated as a resource person in various faculty development programs, workshops and conferences. He is currently working as Controller of Examinations at JSS Academy of Higher Education & Research (Deemed to be University), Mysuru, Karnataka.

**One of the most highlighted drawbacks of today's examination system is the emphasis on rote memorization. The NEP-2020 advocates *formative assessment*, which is scientific, continuous, comprehensive testing learning/ knowledge/ conceptual understanding. These examinations would test the achievement of basic learning outcomes, through assessment of core concepts and knowledge from the national and local curricula, along with relevant higher-order skills and application of knowledge in real-life situations. How can this system of evaluation be useful to enhance the quality of higher education? According to you, how important is this as far as graduates' progress in his life is concerned, along with nation building? What types of examination systems exist in the University of Bradford? Do they match with the systems that NEP-2020 recommends? How exactly is this examination system going to be?**

Higher education needs to be re-envisioned so that the duration, structure, and design of the educational programmes match the role requirements that graduates will play. Students will be assessed at regular intervals on well-defined parameters.

Education thus, must move towards less content, and more towards learning about how to think critically and solve problems, how to be creative and multidisciplinary, and how to innovate, adapt, and absorb new material in novel and changing fields. Pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centred, discussion-based, flexible, and, of course, enjoyable. Preparation of professionals must involve an education in the ethic and importance of public purpose, an education in the discipline, and an education for practice. It must centrally involve critical and interdisciplinary thinking, discussion, debate, research, and innovation. Teaching and

programs should ensure that students have the necessary learning opportunities and are assessed by the appropriate methods. Skill competencies including communication skills, critical thinking, problem solving, team-work, organization skills, management skills, and information technology skills should be part of the core undergraduate curriculum.

The evaluation systems followed at the University of Bradford are analogous with the existing evaluation system in India. At the University of Bradford, students' assessment marks for each component of the summative assessment are input into the University's Student Administration Information Navigation Tracking System (SAINT) for monitoring the performance of students and mentoring them for continuous improvement. Also, there is a well-structured evaluation and assessment feedback system for all the stakeholders. This helps the administrators to bring about changes in the policy or for introduction of the need based new regulations for enhancing the system effectiveness. NEP also advocates comprehensive and more broader assessment systems.

NEP emphasizes focus on regular formative assessment for learning rather than the summative assessment. HEIs shall move to a criterion-based grading system that assesses student achievement based on the learning goals for each programme, making the system fairer and outcomes more comparable. HEIs shall also move away from high-stakes examination towards more continuous and comprehensive evaluation. There will be a shift from summative assessment to regular and formative assessment, which is more competency-based, promotes learning and development, and tests higher-order skills, such as analysis and critical thinking.

**The concept of Academic Bank Credit (ABC) recommended by the NEP-2020 allows students to leave a course and join it after a certain time from where they have left it. Through ABC – the movement of students within a university, implying from one course to another and across universities from one institute to another – will also be possible. The University Grants Commission (UGC) has already taken steps to implement it. What is this concept actually? And how is this going to be implemented?**

The Academic Bank of Credit (ABC) will function much like a commercial bank. The students will be the account-holders to whom the bank will provide credit accumulation, credit transfer and credit redemption services. These credits can be deposited to student accounts. After the accumulation of credits, a student can redeem these to get any academic degree. If students are working towards a qualification, they will have to accumulate sufficient credits to gain the total credit value of the qualification. Students may be able to transfer their credits as part of one study programme to another, offered by the same institution.

NEP-2020 provides for creating a lifelong learning knowledge society based on the premise of equal and wider learning opportunities to all. Prevailing formal education systems are restrictive in respect of learning opportunities hence cannot meet the 21st Century learners' needs. Non-formal education system is yet to receive sufficient social and government recognition. Added advantage of this initiative perhaps is that the learners have the option to either learn formally or informally in full-time or part-time modes or both. Consequently, ABC will promote the much sought-after quality, flexibility and collaboration alongside access and equity to improve the efficacy of the nation's higher education system and to make it current

and relevant. This will also enable students to develop global competencies and life skills. Academic Bank Credit (ABC) recommended by the NEP is a forward-looking step in achieving reformative changes in the educational space of the country.

Salient features of the Academic Bank Credit (ABC) recommended by the NEP:

- Promotes student centricity in higher education with learner-friendly approaches across the country and promote a more inter-disciplinary approach in higher education.
- To enable students to select the best courses/combination of courses to suit their aptitude and knowledge thirst.
- To allow students to tailor their degrees or make specific modifications/specializations rather than undergoing the rigid, regularly prescribed degree/courses of a single university/autonomous college.
- Facilitates seamless integration of the campuses and distributed learning systems by creating opportunities for student's mobility within inter and intra university systems.
- Allows students to choose a pace for their studies along with the associated cost.
- Enables multiple entry-multiple exit scheme for students to complete their degrees as per their time preferences.
- Provides mobility across various disciplines like degree, diploma, PG diploma, certificate programmes and facilitates lifelong learning amongst students in full time and part-time modes.
- Maintains academic records and issues an official transcript. This transcript will be recognized by all the member-universities of ABC.

Thus, NEP-2020 stipulates the Academic Bank of Credits (ABC) for digitally storing the academic credits earned from recognized institutions to enable an institution to award a degree to students upon earning and accumulating credits required for completion of the program concerned. For smooth operation, ABC may be linked to the National Academic Depository (NAD).

That credit earning and credit transfer is already in practice but not universally applicable to HEIs in India. The University Grants Commission (UGC) has released draft regulations for establishing an Academic Bank of Credit (ABC) in line with the NEP. Along with the implementation of NEP clear procedure shall be laid down for enabling recognition of the credits earned by the students. ABC will go a long way in providing optimum opportunities to the learners in all aspects of learning and will thereby democratize higher education in the country.

**The Exam Reforms 2018, by AICTE recommends using Scoring Rubrics as an Assessment Tool, Open-Book Examinations and other means for continuous assessment of students' progress. How is this AICTE policy going to be useful as far as progress of higher technical education in India is concerned?**

## **Scoring Rubrics**

A rubric is a multi-purpose scoring guide for assessing student products and performances. It helps improve teaching, contribute to sound assessment, and serve as a source of information for program improvement. A rubric for assessment, usually in the form of a matrix or grid, is a tool used to interpret and grade students' work against criteria and standards. A rubric makes explicit range of assessment criteria and expected performance standards. They serve as a guide to both students and the teachers. For students, for example, it serves as a guide for self-assessment of their performance and know what to expect on how a teacher will be grading their assignment. It also guides them to complete their assignments. On the other hand, teachers can use it to assess student's work in an assignment or in a course and ensure objectivity in their grading. Steps involved in constructing/developing a rubric are:

- Identifying performance criteria
- Setting performance level
- Creating performance descriptions
- Organizing the descriptions into a tentative rubric
- Evaluating and revising the criteria.

Use of Scoring Rubrics as Assessment Tool in Higher education will offer the following benefits:

- allows consistent assessment.
- Clearly communicate the grading procedures.
- Make scoring easier and faster.
- Make scoring more accurate, unbiased, and consistent.
- Helps students to understand the course expectations.
- Helps students to self-improve.
- Inspires better student performance.
- Improves feedback to students.

## **Open Book Examination**

In open book examination, the examinees can consult their class notes, textbooks, and other approved material while answering questions. Thus, an open book exam allows students to consult some form of reference material while completing the exam. It is ideally suited to teaching programmes that especially aim at developing the skills of critical and creative thinking.

Open-book exam encourages greater engagement and improves understanding of the course material. Since, open book exams do not have the same emphasis on memorization, questions can move up in the Bloom's Taxonomy of Educational Objectives, and ask students to analyze, evaluate, or synthesize knowledge, rather than just remember it. The higher education is supposed to equip the learners with intellectual abilities and skills. Open Book exams test their ability to quickly find relevant information and then to understand, analyse, apply knowledge, and think critically. It emphasizes higher order skills, de-emphasizes cramming or rote memorization. Thus, open book examinations will provide a new dimension to the students' assessment.

However, in the higher technical education, the academic and assessment modules shall be designed and developed carefully to align with open book examination's methodology. Also, the teachers are required to be specially trained in setting questions for open book examinations as the questions shall emphasize problem solving, creativity, or deep knowledge rather than a simple recall of facts.

**There are numerous challenges to conducting online examinations at scale, including limitations on the types of questions that can be asked in an online environment, handling network and power disruptions, and preventing unethical practices. How are we going to address these challenges?**

The Online Examination System is intended to make the examination forms simpler and paper-free which allows students to take exams in remote areas.

The challenges in the conduct of online examinations are as follow:

- Examination delivery – type and structure of questions, creation of question bank.
- Availability or accessibility of PCs and other suitable devices to all the students
- Safety and security of question paper
- Hardware system or internet failure or power blackout
- Challenge of impersonation and malpractices
- IT Proficiency – for both examiners and examinees

Adequate training shall be given to teachers on pattern and requirements for setting questions for online examination. Students shall be given adequate exposure and mock trials on the system. FAQs and troubleshooting training program must be provided.

With the advancement of web innovation, use of online proctoring system employing artificial intelligence (AI) and wider availability and affordability of internet facility in our country, have made online examination a better option, especially to administer examination to students in remote locations at difficult times.

The Government shall develop and provide a simple, robust, and versatile online testing and evaluation software, that provides comfortable and convenient exam conditions for both the administrators and the learners with adequate security system. The system should have proper authentication and authorization process to prevent impersonation and malpractices.

**The National Testing Agency (NTA) will work to offer a high-quality common aptitude test, as well as specialized common subject exams in the sciences, humanities, languages, arts, and vocational subjects, at least twice every year. The high quality, range, and flexibility of the NTA testing services will enable most universities to use these common entrance exams – rather than having hundreds of universities each devising their own entrance exams. What is your opinion on this? Will it be beneficial for students and or HEIs? Will it promote merit? Will it be useful to avoid unethical practices during the entrance exams conducted by various HEIs?**

Presently, the students are appearing for various entrance tests for securing admission in different universities. The NTA will serve as a premier, expert, and autonomous testing organization to conduct entrance examinations for undergraduate and graduate admissions and fellowships in higher education institutions. The high quality, range, and flexibility of the NTA testing services will enable most universities to use these common entrance exams – rather than having hundreds of universities each devising their own entrance exams – thereby drastically reducing the burden on students, colleges, universities, and ultimately the entire education system.

As there will be a uniform assessment pattern and national ranking in these common entrance test this will certainly give advantage to the meritorious learners and helps to avoid unethical practices during the entrance exams conducted by various HEIs.

**Such entrance exams will test conceptual understanding and the ability to apply knowledge and aim to eliminate the need for taking coaching for these exams. What will be the impact of this, according to you?**

These exams shall test conceptual understanding and the ability to apply knowledge and shall aim to eliminate the need for taking coaching for these exams. Students will be able to choose the subjects for taking the test, and each university will be able to see each student's individual subject portfolio and admit students into their programs based on individual interests and talents. However, the training and capabilities required to effectively face these entrance examinations shall be built into the new educational framework to really achieve the elimination of the need for taking coaching for these exams.

**Any other suggestions you might have.**

With the technological advancements, rapid globalisation, and unprecedented developments such as the COVID-19 pandemic, the proposed reforms mentioned in NEP shall focus on equity, inclusivity and digital literacy with aim to transform India into a knowledge superpower, thus making the Indian education system on par with global practices in the segment while creating a technology-driven generation who are ready to plunge into the future workforce.

# NEP 2020: From Diploma Perspective - Through Administrator's Viewpoint



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## **Background and Summary**

The aim of higher technical and professional education is to produce and train skillful, knowledgeable, and enlightened individuals that help the nation to progress scientifically, socially, artistically, technologically and economically. They should contribute to make the world a better place to live with harmony and peace, to upgrade quality of life and to alleviate human suffering.

India is said to be the Demographic Dividend Capital of the world. By 2027, India will have the world's largest workforce, according to 2017 Bloomberg News Analysis of UN population data. India has the largest number of students in the world estimated to be 315 million in number and about 15% of the Indian students are studying abroad. According to a survey, Indians spent 56000 – 120000 crores at foreign universities for higher education in the form of fee paid.

The National Education Policy (NEP) 2020 is the first education policy of the 21st century which aims at making India as a Global Knowledge Superpower through an inclusive, participatory and holistic approach and this thought process is based on the pillars of Access, Equity, Affordability and Accountability. The policy appears to have a scientific approach towards education and is progressive in spirit. It is aligned to the 2030 Agenda for Sustainable Development Goals (SDG). Under the guidance of Prime Minister Narendra Modi, the Government of India has come up with National Higher Education Policy 2020 (NEP), which aims to transform the current HEI model into a value based educational model. Practically, the transformation could take more than several decades to materialize. However, the easiest way to achieve the goals lies in preparing an altogether new framework that focuses on every single aspect that can lead to better educational standards.

This is the reason why the NEP higher education blueprint has proposed the concept of college autonomy.

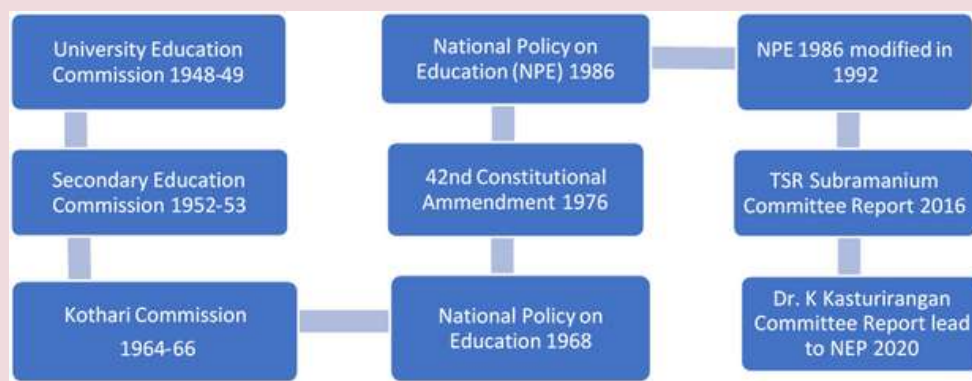


Figure 1: Timeline of education policies in India

The NEP 2020 was announced on 29th of July 2020. At the outset, the policy seemed to be overambitious and challenging to implement but when we dive deeper with a broad, open, and progressive mind set, it appears to be well thought, peer reviewed with defined timelines and resource utilization. Yet, the fear of the unknown is anticipated by the entire education fraternity and so is the case with the pharma education fraternity. The key goals of NEP 2020 with respect to higher education (HE) have increased the investment in education sector to 6% of Gross Domestic Product (GDP), universalization of education with increase of Gross Enrolment Ratio (GER) in HE from the current 23% to 50% and increase in intake capacity by 3.5 crore seats.

The NEP 2020 proposes lifelong learning and research to avoid human beings becoming obsolete in society in terms of knowledge, skills, and experience to lead a comfortable life. It focusses on 5 E models – Education, Economy, employment, employability, Entrepreneurship.

### Analysis of NEP 2020 with Higher Education Perspective

The highlights of NEP 2020 with respect to higher, technical and professional education include:

#### 1. Regulation and Hierarchy

- HE monitoring and controlling institutions like UGC, AICTE, MCI, DCI, INC, etc. will be merged with the Higher Education Commission of India (HECI) as a single regulator for HE institutions under the umbrella of which four agencies would function namely National Higher Education Regulatory Council (NHERC) for regulation, General Education Council (GEC) for standard setting, Higher Education Grants Council (HEGC) for funding, and National Accreditation Council (NAC) for accreditation.
- Consolidation of existing fragmented HEIs into two types of Multidisciplinary Universities (MU) and Multidisciplinary Autonomous Colleges (AC) with the campus having more than 3,000 students. The timeline to become multi-disciplinary is by 2030 and to have 3,000 and more students by 2040.
- Multidisciplinary Universities will be of two types of namely Research-intensive Universities and Teaching-intensive Universities.
- Every existing college will develop into either degree granting autonomous college or migrated into a Constituent College of University and becomes fully a part of the University.

- The various nomenclatures currently used such as deemed to be university, affiliating university, central university, affiliating technical university, unitary university, etc. will be replaced by 'University' after fulfilling the required criteria as per norms.
- Affiliation of Colleges is to be phased out in 15 years and a stage-wise mechanism is to be established for granting graded autonomy to colleges. Over a period of time, it is envisaged that every college would develop into either an Autonomous degree-granting College, or a constituent college of a university.
- Top 100 Global Universities would be encouraged to set up campuses in India, which if done on brown field investment basis would open doors for Foreign – Indian university collaborations.

## **2. Academic Functional aspects**

- Research will be included in UG, PG levels with a holistic and multidisciplinary education approach.
- Pedagogy in HEIs will focus on communication, presentation, discussion, debate, research, analysis, and interdisciplinary thinking.
- Multiple entry and exit options would be given in degree courses. Four years bachelor's degree with multiple exit options after one year (certificate course), two years (advance diploma course), 4 years bachelor's degree course with an option to get research degree if supplemented by an extensive research driven project, one to two years master's degree based on the number of years spent in bachelor's degree as four or three, respectively, and option to do Ph.D. after four years bachelor's degree with research are possible. Two years master's degree with full research in the second year, one- year master's degree for four years Bachelor degree holders, and Five years integrated Bachelor/Master degree are also provided.
- An Academic Bank of Credit (ABC) will be established which would digitally store the academic credits of all registered candidates earned from various recognized HEIs (SWAYAM & ODL mode) that can be considered while awarding degrees by the college or university.
- All HEIs will focus on research and innovation by setting up (1) Start-up incubation centres, (2) Technology development centres, (3) Centres in frontier areas of research, (4) Centre for Industry-academic linkage, and (5) Interdisciplinary Research Centres including humanities and social sciences research.
- Healthcare education system must be integrated in such a way that all students of allopathic medical education must have a basic understanding of Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH), and vice versa.
- Technical education should be offered within multidisciplinary education institutions and should focus on opportunities to engage deeply with other disciplines. The focus should be on offering Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning, in addition to genomic studies, biotechnology, nanotechnology, neuroscience, with applications to health, environment, and sustainable living.
- There shall be a much greater emphasis on preventive healthcare and community medicine in all forms of healthcare education.

### **3. Assessment and Result**

- Choice Based Credit System is revised by an innovative and flexible Competency Based Credit System.
- Examination system will change from high-stakes examinations (Semester End system) towards a more continuous and comprehensive evaluation examination system.
- Encouragement for Online Distance Learning (ODL) courses as a part of degree programmes to include the credit system. The Degree programmes may contain in- class teaching, Online teaching components, and ODL components with 40:30:30 ratio model to achieve a global standard of quality.
- Common entrance exams for universities' admission and low stakes board exams.

### **4. Student Support and Holistic Development**

- All HEIs will have professional academic and career counselling centres with counsellors available to all students to ensure physical, psychological and emotional well-being.
- All HEIs will develop, support, and fund for topic-centred clubs and activities organized by students with the help of faculty and other experts as needed, in science, mathematics, poetry, language, literature, debate, music, sports, etc.
- National Scholarship Portal will be strengthened and expanded to help the financial needs of merit-based students. Private HEIs will be encouraged to offer larger numbers of free ships and scholarships to their students.
- Industry – Academia Interfaces would be encouraged to drive innovations and research.
- Skill Development, Technological skill building with an alignment towards the health, environment and sustainable living would be woven and encouraged for enhancing the employability of the technical and professional workforce.
- Silos between technical education and other disciplines would be strengthened and technical education would be offered within multidisciplinary education institutions and programmes and have a renewed focus on opportunities to engage deeply with other disciplines.

### **5. Analysis and Critique**

The major existing issues in technical and professional education that are intended to be addressed with the help of the NEP 2020 are:

- Low employability of technically qualified manpower with low skills, acute shortage of lawyers, judges, doctors and healthcare professionals
- Impact of fourth industrial revolution and lack of alignment of Indian education with the SDG seeking it to be more inclusive and equitable along with life learning opportunities for all.
- The indexing of India on global charts of Human freedom, gender index, inequality, happiness, peace, human development, environmental performance, hunger, corruption performance index is not very encouraging.
- The prevailing system of education is itself diversified and unequal. We have various modes of ownership like government, aided and unaided institutions providing diversified education with respect to curricula, management, rules and regulations, infrastructure, teachers, mentors, and instructors etc.

- In the past decades, there has not been any ground-breaking research notified in spite of having the best brain power. There is a serious lack of adequate infrastructure for education and research and lack of availability of funding for R&D and Drug development and Drug discovery. Although India is recognized as the Pharmacy of the World globally, it is in terms of manufacturing capacity and not based on Creativity, Innovation, Research and Development.
- There has been no recruitments and career advancement in the universities and many prestigious and important centres of higher education imparting professional and technical education are run by guest faculty or adjunct faculty.

However, there are some grey areas cited in the proposed fabric of the policy. Implementation of NEP 2020 in due course of time might further increase the stratifications within the society based on language and socio economic and cultural backgrounds. The Indian government might be wanting to make it mandatory for foreign students to learn Indian language to better understand Indian culture and country. But with several regional languages and the official language, Hindi taken a back seat it might be challenging. Under the new system, one must study for four years to complete their graduation while with the option of multiple exit points he/she might exit after one or two years and have two years of work experience. Hence the job providers need to specify the required qualification and certifications very clearly and specifically so that there is no over-qualification.

### **NEP from the Lens of Pharmacy Education**

Pharmacy Council of India (PCI) and Pharmacy Act were created to establish minimum qualification required to be a pharmacist. Currently, PCI and AICTE regulate pharmacy profession and education simultaneously in many institutions although honorable Supreme Court has declared PCI as the sole regulator. Global pharmacy graduates are now concerned with production of pharmaceutical products, development of the methods or processes of production and quality control. Those in research concern themselves with synthesis of new drugs (what is commonly referred to as molecules), new processes, clinical testing of the effects of such drugs on animals and humans and obtaining the required License from the drug control authorities.

Present Indian pharmacy education is lacking professionalism, rational thinking and problem solving as per global need. Indian pharmacy education is less focused on research and development with logical bent of mind. Another, integration of the thoughts of medical sciences, pharmaceutical sciences, nursing, engineering sciences and basic sciences has never taken place in India. Now we have to define the goals of pharmacy education for present and future and reframe our curriculum according to defined goals to meet the global challenges. All global institutes are now moving towards excellence in research and capability building and there is a rapid transition in pharmacy profession worldwide and in the era of globalization.

The COVID-19 pandemic has severely impacted the education sector making a forward shift to digital learning models and urging us to permanently adapt ourselves towards blended learning in near future. It is anticipated that digital format of T-L is here to stay, and institutions need to evolve and adapt to these tools and ed-tech platforms as soon as possible. This would

ease the requirements of physical infrastructure to some extent. The teachers need to be trained and prepared for the use of technology in content delivery and other aspects of education because the human element in the process of education will, hopefully, continue to play an integral role.

With a perspective of regulation and control, it might be so that the pharmacy education would be offered through Multidisciplinary Education and Research Universities (MERUs) offering education at par with global education. However, research funding would involve National research Foundation which would act as an apex body for fostering strong research culture and building research capacity across the nation. It might be so that PCI would function under the aegis of NHERC as an apex body for Pharmacy Education and Pharmacy professional practice in India. Agricultural education and research would be promoted and hence there is a great opportunity for Pharma-Agri combination that focuses on development of foods that heal, foods that are nutritious and foods that boost immunity and help in disease prevention and care.

From a course conduct perspective, in the light of NEP 2020, one can foresee that the pharmacy graduation course would be spread over a duration of four years with an exit option after two years plus adequate field work training conferring a diploma pharmacy certification and if the student wishes he / she can carry out a one-year research project during the fourth year to obtain a research qualification. This research project entitlement has to be validated by the mentors to be granted to deserving students only based on their credentials so that the research qualification should not be diluted. Advanced post graduate research qualification of two years can be pursued by the pharmacy graduates followed by PhD research work of three years. In this manner the existing duration of study from diploma to PhD would be reduced from 10 years to 8 years. The assessment process is proposed on a combination of marks, self-assessment, peer assessment and teacher assessment.

### **Diploma in Pharmacy perspective**

According to Education Regulations 2020, the entry criteria for admission to diploma in pharmacy course as well as bachelor's degree and Pharm D courses is passing certificate in class XII in science stream with either Mathematics, Biology or both the subjects as electives. Diploma course spread in three parts; Part 1 and 2 to be undergone in a PCI approved institution and Part 3 which consists of 300 hours of practical training spread over a period of not less than three months. After the diploma certificate is awarded, the student is provided the registration certificate from the State Pharmacy Council, or a body designated for the purpose by the PCI. This certificate empowers the candidate to practice the profession of pharmacy with respect to community pharmacy practice.

The Diploma Pharmacy course is offered by universities, independent colleges as well as a program level in the branch of pharmacy. The examining authorities are affiliating universities or the Technical Education Boards. The D.Pharm course conduct has annual examination pattern and is not semester based. After completing diploma in pharmacy, the candidate can get admission in second year B.Pharm course through the provision of lateral entry admission.

D.Pharm course is regulated by PCI and in many institutions with dual regulation of AICTE too. After the honorable Supreme Court's judgement in Mar 2020 regarding the PCI being the sole regulator of pharmacy education, many institutions have withdrawn their regulation from AICTE in the last year.

As per Education Regulations 2020 [to be implemented with effect from academic year 21- 22] the diploma pharmacy course has extensive curriculum covering many subjects like pharmaceuticals, pharmaceutical chemistry, community pharmacy and management, pharmacognosy, Human anatomy and physiology, pharmacology, social pharmacy, biochemistry and clinical pathology, pharmacotherapeutics, hospital and clinical pharmacy, pharmacy law and ethics. All the subjects except pharmacy law and ethics have both theory as well as practical components.

Table: 1. Number of institutions with intake capacity for various pharmacy program

Program level	D.Pharm u/s 12	Diploma for conduct	B.Pharm u/s 12	B.Pharm for conduct	M.Pharm
<b>No. of institutes</b>	1632	1456	1290	868	<b>700</b>
<b>Annual intake capacity</b>	<b>97920</b>	<b>87360</b>	<b>103200</b>	<b>52080</b>	<b>21060</b>

Generally, the takers of diploma pharmacy course are business owners or those who are not interested to pursue a long duration course. Some students also chose D.Pharm over B.Pharm for financial reasons as the diploma pharmacy course is way economical as compared to the undergraduate course. Many students though choose to opt for B.Pharm course after completing D.Pharm for better career prospects.

If we talk about the teachers involved in D.Pharm teaching then the eligibility criteria for diploma and undergraduate teaching is the same. The only difference lies with the nomenclature of designation as the diploma teachers who are appointed in the government are in the cadre of lecturer. The nomenclature pattern of AICTE which has kept the designation of lecturer for diploma courses has ignored the fact that diploma in pharmacy has a higher entry and eligibility criteria for both the students and teachers as compared to that in polytechnics where students can enter after SSC certificate.

In the light of the NEP 2020 implementation, the D.Pharm course would probably be like an advanced diploma of two years duration (equivalent to D.Pharm) after which the student can register themselves in the state pharmacy council or PCI for practicing the profession of pharmacy. Some subjects related to use of computers and technology need to be added in the curriculum in the first two years along with electives like drug store management, production assistant, marketing representative, entrepreneurship development course etc. The credits would be held in the academic bank of credit [ABC] and they can be transferred if the student wants to pursue the degree level course in future. This system would be beneficial to students belonging to economically weak sections where there is a pressure on the student to earn as soon as possible to support their families.

The NEP 2020 implementation would give the students flexibility and freedom to opt for the choice of program level and will lower the pressure and burden of performance for slow learners. As per the need and interest, the student at any point of time can pursue the program level and even take up a research project without investing huge amount of time and money.

## **Conclusion**

The new pattern of higher professional education proposed by NEP 2020 would be beneficial to pharmacy field in terms of higher enrolment ratio, less infrastructure, less disparities with respect to content and curricula, less regulation, technological orientation, and in my opinion if the NEP 2020 is implemented in a thoughtful and careful manner, then the courses of pharmacy and pharmaceutical sciences can earn lots of respect, importance and worth in terms of employability and entrepreneurship.

NEP makes recommendations for motivating, energizing, and building capacity of faculty through clearly defined, independent, transparent recruitment, freedom to design curricula/pedagogy, incentivizing excellence, movement into institutional leadership.

It aims to deliver competency-based education and outcome-based learning, integration of subjects along with technology supported teaching learning tools along with standard pedagogy, development of scientific temper with strong sense of human values, eliminating silos among the subjects and learning, with greater emphasis on digital literacy and promotion of multilingual teaching for easy understanding.

It can be summarized that although the vision and entire policy planning is highly thoughtful and radical but effective implementation from each and every arm of the national framework is what would shape the future of the important healthcare profession known as Pharmacy.

# New Education Policy 2020: Vision, Principles, Reforms and Objectives



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## Introduction to National/New Education Policy 2020 (NEP-2020)

Education is a fundamental requirement for the development of humanity's energy, an equitable community, and the growth of a nation. Global access to the teaching process with a high-quality approach is critical in today's world, and a key goal of India. Education plays a vital role in maintaining equality, social justice, growth of economic sectors, development of science, growth of culture and thereby the integrity of the country. The world is currently undergoing rapid changes in terms of the landscape of data, information and knowledge. There is a huge potential towards technological and scientific advances, machine learning, along with the approach of artificial intelligence. Also, there is great demand for subjects like computer science, arts, mathematics and data science, along with many multi-disciplinary areas. There is a desirable need for change in integrity, quality and equity of educational systems and platforms from early childhood care to all levels of education to address the gap between the present scenario of teaching and learning and the needs of today's world (1, 2). Table 1 lists some of the features in the current and new education policy (NEP).

## A Vision of NEP-2020

The vision of NEP-2020 is to implement values, skills, knowledge and dispositions which are helpful to support responsible commitment to the rights of the people, continuous improvement and global well-being by presenting a truly global citizen. It includes preparing the students having deep rooted pride with high quality and centric education system in India and helping to change and reform India into a vibrant and equitable informative nation in the world. Figure 1 represents highlights of the vision of NEP-2020 (4).

## Principles of NEP-2020

The principles of NEP 2020 are listed below (5):

- To identify, recognize and strengthen the unified potential of each and every student of the nation.
- To promote each and every student's holistic development in educational and non-educational spheres.
- To achieve numeracy and foundational literacy thinking in students.

To give flexibility for learners/students to choose their learning fields and their programs as per their talents and interests.

- To achieve a multidisciplinary and holistic education in science, social science, arts, humanities, and sports in order to ensure the unity and integrity of all knowledge.
- To promote multilingualism as well as the power of language in learning and teaching.
- To provide life skills such as communication, teamwork, cooperation, and resilience during education.
- To carry out formative assessment for learning instead of summative assessment.
- Full equity and inclusion as the basis of all educational decisions.
- To make teachers and faculty as the heart of the learning process.
- To provide a ‘Light but Tight’ regulatory framework to promote integrity, transparency and resource efficiency of the educational system.
- To encourage innovation and out-of-the-box ideas through autonomy, good governance and empowerment.

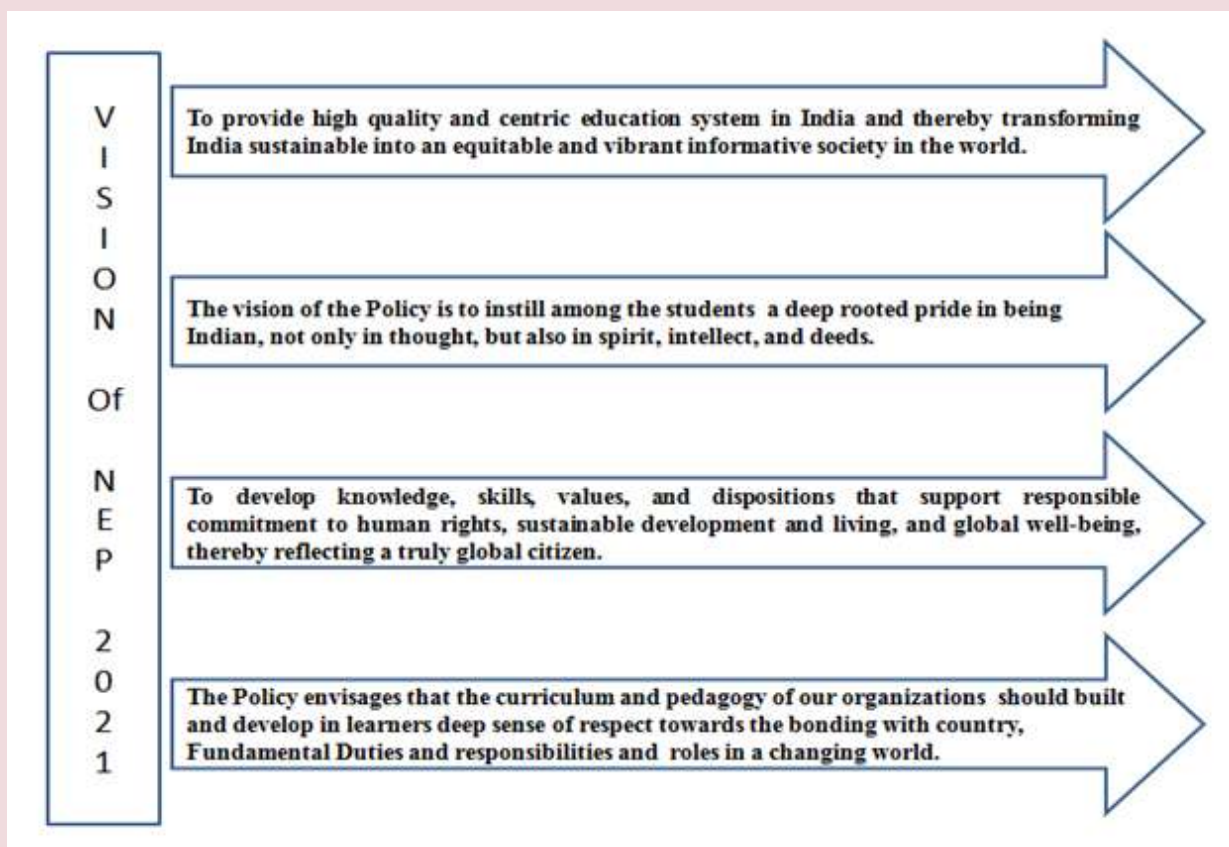


Figure 1: Vision of NEP-2020

### Highlights of Indian NEP-2020:

The various lifecycle stages of NEP are listed as below:

1. Foundation Stage
2. Preparatory Stage
3. Middle School Education Stage
4. Secondary Education Stage
5. Under Graduation Education Stage
6. Post-Graduation Education Stage
7. Research Stage
8. Lifelong learning

Table 1: Current Education Policy Vs New Education Policy

Current Education Policy	New Education Policy (NEP)
<b>The objective of the current teaching-learning system of education is the all-round development of learners.</b>	NEP's main goal is to provide interdisciplinary, scientific, multi-subject, and multidisciplinary scope in teaching and learning.
<b>The basic teaching-learning process has a structure of (5+3+2) +2+3+2.</b>	The common teaching-learning education pattern will be 5+3+3+4+4+1.
<b>The primary learning starts at the sixth year of a child.</b>	The primary learning process will start at the age of three years, which is considered as the foundational stage.
<b>Two years of learning at higher education and two years of pre-university teaching levels were considered separately with board examinations.</b>	Four years of secondary learning stage of education is considered and framed by combining the two years of secondary level education and two years of pre-university learning.
<b>In the two years of secondary higher learning, students have the choice to select the specialization subject such as arts, commerce or science.</b>	In NEP, four years of higher education at secondary stage will have basic subjects along with some elective ones.
<b>In the current system of education, all the UG and PG admissions are done at college level by taking entrance examinations at state, college, or university level.</b>	According to the NEP, the admissions at PG and UG level will be done by the "National Testing Agency".
<b>In the current education policy, we have 3 or 4 years of UG courses or programs.</b>	In NEP, the UG programs will be for 4 years, having a system of choice to exit: after 1 academic year as diploma completion, after 2 years as advanced diploma completion, after 3 years with a passed degree, and after 4 years with a project-based degree.
<b>Postgraduate education in the current educational system lasts two years and includes specialization subjects.</b>	According to the NEP, postgraduate education will last 1 to 2 years and will focus on more specialized subjects and research.

## **Objectives/Reforms of NEP-2020 at Various Levels of Education**

### **Objectives/Reforms in School Education as per NEP-2020**

1. The curricular structure of education will be '5+3+3+4' with regards to ages three to eighteen.
2. Students will attend exams in classes third, fifth and eighth.
3. The class tenth and twelfth board examinations will be conducted in two formats: subjective and optional.
4. It will be possible to achieve a unique and centralized quality of education and rules in private and public organization schools.
5. It consists of vocational teaching and learning.
6. In the NEP, the mother tongue and local languages will be used as medium of learning and it will be continued up to 5th class and should continue till class 8th.
7. It consists of the scope of the curriculum to basic and core subjects.
8. Centralization of teaching and learning from an early stage of learning will be done and it is applicable to secondary level also.
9. To get a 100% "Gross Enrolment Ratio" in teaching-learning at school level.

### **Objectives/Reforms in Higher Education as per NEP-2020**

1. To provide multi-disciplinary teaching-learning, holistic approach and teaching in an undergraduate learning stage.
2. To provide post graduate programs for about one or two years.
3. The admissions process to the various universities will be by taking examinations at the National Testing Agency.
4. To transfer credits, development of an "Academic Bank" will be established.
5. To establish research universities and multidisciplinary education as an approach of great multi-disciplinary teaching with worldwide quality standards.
6. To set a national research foundation for creating strong research areas and creating research interest in all the levels of the higher education system.
7. To establish a new organization in India to operate and control higher teaching-learning.

### **Objectives in Teacher Education as per NEP-2020**

1. The minimum teacher's qualification will be a four-year integrated B.Ed. degree.
2. To strengthen and promote the transparent recruitment process for teachers.
3. To develop a new "National Curriculum Framework" for teaching, learning and Education.
4. To set the "National Professional Standards" for all the teachers in India.

### **Other Important Objectives of NEP-2020**

#### **The other objectives of NEP 2020 :**

1. To establish the National Education Commission.
2. To develop separate and special education zones to improve the teaching and learning in all the areas.
3. To provide a gender inclusion fund to improve education for transgender children and women.
4. To develop the National Educational Technology Forum that will act as a good platform to promote the easy circulation and exchange of ideas and knowledge regarding technology applications in education.
5. To evaluate the learners, a national evaluation centre called "PARAKH" will be established.
6. To establish new language organizations such as the "Indian Institute of Translation" and "Interpretation and the National Institute".
7. To establish the "National Mission for Mentoring", "National Book Promotion Policy" and "National Mission on Foundational Literacy" for promoting education.
8. To increase the applications of novel tools in teaching, teaching-learning planning, and evaluation.

## Conclusion

NEP-2020 aims to bring reinforcement in education reforms and helps to replace the thirty-four-year-old education policy and ideas. NEP-2020 has come with very essential and important changes in the teaching-learning system of India. The NEP-2020 focuses on balancing the various domains, including culture, traditional, inter and multi-disciplinary areas which are the current requirements of the 20th century. NEP-2020 has potential tools required to be competitive to provide great strength and develop skills and knowledge in the youth of our nation.

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# Fun & frolic

## Unscramble the government initiatives

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**Solutions on Page 82**

# Challenges, Reforms and Emergence of Innovative Teaching Methods during COVID-19 Pandemic



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In March 2020, the novel coronavirus shot up into a global pandemic and all the educational institutes over the world made the difficult decision to close their doors. In order to continue with the curriculum, there was an abrupt and complete transfer to distance learning, which was really disruptive for the students, teachers and equally the parents as well. In the beginning, it looked like a momentary emergency precaution but swiftly it made a way as students including even the senior graduates passed out from their institutes remotely. Later the institutes were tackling with how or even whether they can be safely reopened. When the situation seemed to be in some control, the institutes were opened but the second wave of coronavirus has again led the students relying on the virtual platforms of learning.

Not only students have been liberated from the schools and are facing tough times while tethering with their educational gadgets, but also the teaching fraternity from all over the world is juggling with the innovative ways of teaching during this pandemic. This global educational crisis has changed the conventional method of chalk 'n' talk to a technology driven method. However, certain challenges that the teaching fraternity faced during the virtual classes have emerged in terms of different techniques of online teaching, different teaching platforms, ICT tools and techniques. Moreover, debates have also been there on how the examination will be conducted and evaluation be done; i.e., whether it will be conducted via online mode or offline.

The major question arose whether the education system will change and will the fraternity be able to upgrade themselves with the latest ICT tools?

To cater the needs of the students and adapt themselves with the current pandemic situation, teachers started exploring the right online teaching platforms having appropriate yet effective features. For that, the first step included preparation of content as per online requirement. For this, teachers explored and included open educational resources (OER) that were available in various reputed national and international repositories. However, during this exploratory process, they were constantly facing several problems and difficulties associated with the modern technology that ranges from installation of various paid or free software, their errors and plug-in issues etc. For this they had to upgrade their tech savvy skills that needed practical hands-on training. During these pandemic times, several higher educational institutes (HEIs) have started planning short-term, hands-on training sessions on MOOCS for teachers so that virtual teaching should not suffer due to lack of technical knowledge and glitch.

Another important step that has been included in the ICT education sector is the adoption of flipped classroom or blended learning techniques, where teachers and students have reversed their roles. In this transition, several effective pedagogical approaches have been identified and created so as to keep students active and engaged via different means like open book tests, open book assessments, assignments etc. Again, sessions on such pedagogical tools have been organized so as to help the teaching fraternity in this aspect.

Even the Ministry of Education (formerly known as Ministry of Human Resource and Development - MHRD) have launched several online teaching platforms like DIKSHA, Swayam Prabha, Swayam, e- PG Pathshala, National Digital Library of India (NDLI), E- shodh sindhu, National Program on Technology Enhanced learning (NPTEL) and virtual labs, so as to address the needs of students as well as teachers. The features of these are described below:

### **SWAYAM- Study Webs of Active Learning for Young Aspiring Minds**

Date of Launch: 9th July 2017

Concerned Body: Ministry of Education

Key features:

- SWAYAM, a MOOC platform was introduced as a scheme under the “Digital India” campaign by the Government of India in 2015.
- It was established through the joint efforts of MHRD and AICTE with assistance from Microsoft.
- The aim was to deliver value education to school students, undergraduate and post-graduate students in India.
- The gateway delivers free study material which is easily printable and downloadable, also include video lectures, discussion forums and online tests from over 1600 courses.
- On completing a course successfully, students get a certificate of reward.

Courses offered:

SWAYAM includes four different parts such as e-Tutorial (teaching video, animation, PowerPoint presentation and Podcast), e-Content (e-Books, illustrations, Case studies, Open source content, Reference and reading resources), Discussion Forums, and Assessments (self-assessment tests such as MCQ, short answer type, Long answer type questions to check whether student is eligible for certificate or not)

### **DIKSHA**

Due to introduction of innovative digital teaching methods by certain teachers in India, State Governments had started some digital programs which was further introduced at National Level in the form of DIKSHA.

Date of Launch: September 2017

Concerned Body: MHRD and NCTE

Key Features:

- The aim is to expediate some advance methods of digital learning for the teachers associated with classes 1-12.
- This platform is not only for imparting education to teachers but also for students who need to stay in touch with teacher’s organization.
- The exclusive feature of DIKSHA program is the QR code which by only scanning allows us to access abundant eBooks and learning material.
- It includes almost 80,000 e-Books for the students of 10+2 class in various languages.

States, government bodies and even private organizations, can integrate DIKSHA into their respective teacher initiatives based on their goals, needs and capabilities.

Courses offered:

- DIKSHA includes training courses, worksheets, lesson videos, curriculum, and assessment tests for teachers.
- The DIKSHA's features can be used to create: In-class resources, Teacher training content, Assessment aids, Teacher profile, News and announcement and Teacher community
- These features have emerged from consultations with multiple state governments, NGOs and more than 30 public and private organizations, who have collaborated in contributing to DIKSHA.

### **e-PG PATHSHALA**

Date of Launch: November, 2015

Concerned Body: Ministry of Education under NME-ICT (National Mission on Education through ICT) and UGC

Key Features:

- e-PG Pathshala is an online platform for PG courses.
- The maintenance and development and administrative responsibilities of e-PG Pathshala are allocated to INFLIBNET Centre.

Courses offered:

- e-PG Pathshala includes 700 e-books freely available for students for about 68 PG courses.
- This portal includes high-quality text contents, illustrations, videos, tutorials, documents, PDFs, etc.

### **SWAYAM PRABHA**

Date of Launch: 9 July, 2017

Concerned Body: Ministry of Education

Key Features:

- It consists of assembly of 32 DTH channels that broadcast almost 24 hours the educational material all over India for students with the help of GSAT-15 satellite.
- Each channel broadcasts for about 4 hours daily.
- The educational material is displayed for about 5 times in a single day as an ease for students to choose the time and also to select the material and the program as per their convenience.

Courses offered:

- SWAYAM PRABHA broadcasts material for 12th class, under-graduate courses and post-graduate courses.
- The material is provided to help students to prepare for competitive exams.

### **NATIONAL DIGITAL LIBRARY OF INDIA (NDLI)**

Date of Launch: 19 June, 2018

Concerned Body: Ministry of Education

Key Features:

- NDLI was developed under NME-ICT as a virtual repository consisting of academic contents in multiple disciplines from schools to PG level.
- NDLI is an all-purpose program for students of all ages, teachers, learners, researchers, librarians, professionals, and other users.
- It is available for almost 24 hours daily.

Courses offered:

- NDLI offers courses in more than 70 Indian languages.
- The learning resources includes eBooks, videos, thesis, manuscripts, documents etc.

### **e-SHOD SINDHU**

Concerned Body: Ministry of Education and Government of India.

Key Features:

- It is a joint strategy offered by Ministry of Education and the Government of India.
- All academic institutions like central and state universities and colleges can take advantage of this platform.

Courses offered:

It is a digital library providing access to e-resources like journals, eBooks, factual, bibliographies, citations, etc. for higher education.

### **NPTEL (NATIONAL PROGRAM ON TECHNOLOGY ENHANCED LEARNING)**

Date of Launch: March, 2014

Concerned Body: Government of India and Ministry of Education

Key Features:

- It is a funded project by Government of India and Ministry of Education.
- It is a combined effort initiated by the Institute of Science, Bangalore, and 7 other IIT institutes (Delhi, Bombay, Kanpur, Kharagpur, Guwahati, Roorkee, Madras).

Courses offered:

The online NPTEL store offers various courses in engineering, science, social sciences, and humanities.

### **VIRTUAL LABS**

Date of Launch: April, 2009 (Project started) and main phase started in April, 2010.

Concerned Body: Government of India and Ministry of Education

Key Features:

- A digital group formed by Government of India along with the Ministry of Education below the NME-ICT initiation.
- The main aim of Virtual Lab platform is to deliver remote access to virtual laboratories for students from both science and engineering streams for PG and undergraduate students.
- This association is directed by IIT Delhi and involves the participation of around 12 institutes.

Courses offered:

The project is offering around 700 web experiments and lab facilities which were recorded under the supervision of trained faculties.

Despite of the availability of all these platforms, one of the major technological issues being faced by students include lack of availability of educational gadgets like smart phones, tablets or laptops and internet connectivity particularly for those who are residing in rural areas. Moreover, they are not aware about the different learning management systems (LMS) which the institutes have implemented for effective teaching. Thus, even if the teacher is equipped with the latest technology, lack of infrastructural availabilities as well knowledge at student's end creates a hurdle in the dissemination of knowledge via online mode. In addition, timings of online learning are so flexible that students certainly not find time to do it. Their habit of expecting personal attention via a two-way interaction makes it difficult for implementation of learning via virtual mode. The exciting thing about science is the "A-ha!" moment, which is associated with the discovery of novel incredibility and efforts to recognize it and lastly, when we do, there is actual satisfaction about it. So, the ground work associated with science is a complete sensitive involvement which they are missing. The associated excitement and joy is being missed by the students.

We have been using zoom, blackboard collaborate, Microsoft teams etc. as the virtual mode of

education. But in a class which is like a fluid with more discussions than lecture based, the real time instructions on these platforms do not allow us to read the pulse of our classrooms to see if the students are struggling with some sort of questions.

However, we cannot overlook the merits of online teaching in the times of such crisis. We need to fix these problems and come up with innovative, yet possible solutions. For e.g., technical glitches could be solved via pre-recorded audio/video lectures, creation of interactive, inculcable, relevant, student-centered, and group-based assignments. Hands-on training about the LMS is must both for teachers as well as students. In addition, creation of social media groups including WhatsApp calls, telegram groups is a must for better and effective communication with students and dissemination of e-contents. Institutes must focus and come up with interactive pedagogical tools that acknowledge the concept of collaborative learning, and project-based learning via electronic mode.

Considering the role of parents in online learning platforms, they should manage the time of their children whether they are school going or College/ university going according to their school time-tables. They should make sure that their children are not directly getting up in the lecture timings and taking their gadgets into hands for attending classes. This type of behavior of students affects their learning minds and shows disrespect to the teachers and the education system itself. So, a decorum regarding education should be made at homes as well.

In conclusion, the need of an hour is the implementation of comprehensive yet effective educational pedagogy that improves the intellectual minds of our future torch bearers and ensures that no student is impeded by education due to their location, or technical errors.

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# Fun & frolic

## **Answer key for Unscramble the government initiatives from page 77**

Training and Research in Frontier Areas

Scheme for Promotion of Academic and Research Collaboration

Scheme for Transformational and Advanced Research in Sciences

# Reforms, Opportunities & Hurdles Posed by New Education Policy- 2020



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## 1. INTRODUCTION

### 1.1 Why New Education Policy (NEP) 2020?

As the landscape of employment is changing at a global level, it has now become critical to focus on not what a child must learn rather how one has to learn. The priority of present-day education is to reduce the content and enable a child to think critically, solve brainstorming problems, and adapt to neoteric technologies in the changing fields. Along with this, the child must be engaged in multidisciplinary innovative activities. Pedagogical approaches must be incorporated to make the present education system more experiential, comprehensive, flexible, quiz or discussion based, student centered and last but not the least, enjoyable for the children. Education system must be strong enough to build the character of a child and enable him/her to become more compassionate, ethical, caring and rational while at the same time prepared for gaining and fulfilling the requirements for present day employment [1].

### 1.2 What is NEP 2020?

In order to fulfill the aforementioned responsibilities of the present education system, the Union Cabinet of India on 29 July 2020 approved a policy outlining India's vision for a new education system, commonly known as New Education Policy (NEP) 2020. This policy came into existence after 34 years when Dr. K. Kasturirangan report was submitted (31 May 2019) that replaced the previous National Policy on Education initiated in 1986 and amended in 1992 by Yashpal Committee. The aim of the policy is for the complete transformation of education system in India by 2021[2].

### 1.3 Principles of NEP 2020

The basic principle of this policy is to inculcate creativity, scientific temper, resilience, and compassion along with ethical and moral values in students. A good educational institution is a place where a stimulating and safe environment comfortable for students exists. There must be a conducive resource with good physical infrastructure and innovative learning environment for children. Apart from this, there should be a seamless coordination and integration among the institutions at all stages of the education system.

### 1.4 Vision of NEP 2020

The new policy envisions to promote an education system deeply rooted in Indian ethos that is capable of transforming India, that is Bharat, perpetually into a society that is completely filled with equitable and vibrant knowledge, thereby providing equal high-quality education to all a

and making India the superpower of knowledge around the globe. The vision is to instill the children to feel proud to be Indian in their thoughts, deeds and intellects along with deep rooted commitments of the human rights for the sustainable development of the country. Hence, they reflect a true citizen in their character globally.

## **2. REFORMS**

### ***2.1 Curriculum and Pedagogy in School***

According to this policy, the school curriculum is restructured, and a new pedagogy is designed as 5+3+3+4 instead of 10+2. The schools should reconfigure the pedagogical structure in order to make it more relevant according to the developmental needs of the learners at different stages of the education.

- a) In this system, the first stage is known as Foundational Stage, which will be divided into two parts; first 3 years in Anganwadi/pre-school and then 2 years of education in primary school in class I and II, both covering the students of age group 3-8 years.
- b) Second is the Preparatory Stage i.e., from class III to class V covering the students of age group 8- 11 years.
- c) Next comes the Middle stage that will cover class VI to VIII and include children between ages of 11-14.
- d) Last will be the Secondary Stage (from class IX to XII in two phases, one is IX and X and other includes XI and XII) covering the age group of 14-18 years.

In the first five years of foundational stage, there will exist a flexible, multi-tiered play way and activity-based learning which will mainly comprise learning language, alphabets, numbers, identifying colors, shapes, logical thinking by solving puzzles, free hand drawing, craft work, puppetry, music and entertainment. Early childhood care and education will also focus on developing behavior, etiquette, ethics, public cleanliness, cooperation, and social capacity in the child.

In the 3 year preparatory stage, in addition to play and activity-based curriculum of foundational stage, there will be incorporation of light books, a bit formal but interactive classroom learning. This will ensure a ground framework which includes reading skills, writing, communication skills, science, arts, mathematics, physical education etc. with the aim of ultimately enhancing the basic knowledge about these subjects.

The middle stage of the NEP 2020 will be composed of next three years of education wherein the pedagogy and curriculum of the preparatory stage becomes comparatively stronger. This stage involves introduction of subject teachers for proper learning and discussion of the more conceptual knowledge about each subject. The students will be ready to grasp experiential learning in different subjects like science, arts, mathematics, arts, humanities etc. along with explorations of relationship among various subjects.

According to this policy, the last stage is the secondary stage that will be composed of multidisciplinary studies for four years. The basics which were well discussed by teachers in the subject-oriented pedagogy and curriculum of middle stage, will be taught in depth, with greater critical thinking and better attention to aspirations of life. Most importantly, the students will be offered the flexibility to opt subjects of their choice. The students will also have the option to exit after Class X and be eligible to enter in a new vocational course available in class XI and Class XII.

Apart from this, the policy is focusing to curtail the dropout rates by taking special initiatives to bring back to school the children who have dropped out and prevent other students not to repeat the same.

## 2.2 Other Initiatives of NEP 2020

Another important concept in this policy includes multilingualism; as younger children are capable of grasping things better in their mother tongue or regional language, it has been suggested that the medium of communication must be in regional language at least up to class V and if possible, up to class VIII. Apart from this, there will be introduction of subjects like artificial intelligence, holistic health, design thinking, global citizenship, education for skill development etc. at different levels.

Based upon the guidelines of NEP 2020, NCERT will formulate a new and comprehensive National Curriculum Framework for School Education (NCFSE) 2020-2021, which is to be revised once in every 5-10 years.

## 3. OPPORTUNITIES

### 3.1 *Teacher Education in NEP 2020*

Apart from students, NEP 2020 will affect the growth of the teachers through different initiatives. According to this policy, if a student belongs to rural area and wants to enter the teaching profession, he or she will be given scholarship by the institutes on the basis of merit. After successful completion of 4-year integrated B.Ed. programme, he will be given local job opportunities so that the student serves as a local area role model in the personality of a qualified teacher.

Incentives will be provided for teachers teaching in rural areas like provisions of local housing nearby or in the school premises or enhanced housing allowances. The harmful practice of excessive transfer of teachers will be halted, in order to make students comfortable with their role models and educational environment. Transfers will be transparent and will be promoted through online mode. In terms of pedagogy and contents, the best test material will be inculcated in Teacher Eligibility Tests (TETs).

For recruitment of teacher for a particular subject, TET and NTA scores will be considered. Apart from this, class room demonstration and interview will be conducted. The interview will also assess the proficiency of the teacher in local language so that he /she can converse well with the local students [3].

### 3.2 *Continuous Professional Development (CPD) in NEP 2020*

Teachers will be given better opportunities for their continuous self-improvement and learn the latest neoteric technologies and innovations along with advances in their field of specialization. These training will be offered in different modes, including local, state, national, and international conferences, seminars, workshops as well as online teacher development modules. Online platforms will be developed so that teachers can share their ideas and best experiences.

### 3.3 *Institutional Restructuring and Consolidation*

With respect to the higher education, a new concept of a Higher Education Institution (HEI), constituting mostly a university and colleges will be developed. The university will be a multidisciplinary institution offering undergraduate and post graduate courses in several disciplines and engaged in high quality teaching and research activities. Meanwhile, an Autonomous degree-granting College (AC) will also provide multidisciplinary higher learning that grants undergraduate degrees. The students will have an option to exit with one year diploma and will be eligible to take admissions later if needed.

By 2040, all higher education institutions (HEIs) shall aim to provide multidisciplinary education with thousands of enrollments. Since the process is time consuming, all HEIs must plan to become multidisciplinary for the first time by 2030, and gradually increase student intake.

### 3.4 *Internationalization*

The aforementioned initiatives of the policy will allow the international students to come and study in India, provide mobility to our students to study abroad and carry out research, and also support them

financially on the merit basis. Versatile courses in different subjects including indology, yoga, music, arts, Indian languages, AYUSH systems of medicine, culture, history, modern India, international relevance of curriculum in sciences, social sciences etc. will provide meaningful opportunities for engaging socially along with quality residential facilities at a single campus to achieve the goal of 'internationalization at home'.

#### **4. IMPLEMENTATION OF NEP 2020- A BIG CHALLENGE**

The implementation of policy is the biggest challenge for the nation. The effectiveness of any policy is dependent on its implementation. The successful implementation will include modification of the curriculum in accordance with the framework of National Curriculum. Further, the educators need to rethink about the learning content rubrics and accordingly modify the text books. Valiant initiatives and actions from multiple bodies including MHRD, Union and State Governments, NTA, NCERT, schools, HEI etc. with timelines and proper plans for review are required to make sure that the policy is implemented at its highest spirit through coherent planning and synergy.[4]

The implementation of policy will be based on the following principles. First and most critical is the implementation of the spirit and intent of the policy in all. Secondly, the policy initiatives must be implemented in a phased manner, as each point consists of several steps to be followed sequentially. Third, prioritization will be done on those points that are responsible for creating a strong base. Fourth, comprehensiveness in implementation will be essential as the policy is holistic, and the desired objective will be achieved only upon a full-fledged implementation. Lastly, since education is a concurrent subject, there must be a careful and joint monitoring involving collaborations between the Central and State governments.

#### **5. CONCLUSION**

At last, it can be concluded that in the decade of 2030-40, the entire policy will be in continuous and operational mode. Once the policy is implemented, it will lead the education systems to grow by leaps and bounds and transform the students as better citizens with full of ethics, compassion, and innovation around the globe. In particular, active financial support will be supplied to different critical components and elements of education system for ensuring universal access, nutritional support, learning resources to all, matters of well-being and safety of student, providing adequate number of teaching staff, teacher development through different online programs, and achieving equitable high-quality education for all the underprivileged and socio- economically backward groups.

#### **6. ABBREVIATIONS**

NEP- New Education Policy

TET- Teacher Eligibility Tests

NTA- National Testing agency

CPD- Continuous Professional Development

NCERT- National Council of Educational Research and Training

MHRD- Ministry of Human Resource Development

HEI- Higher Education Institution

NCFSE- National Curriculum Framework for School Education

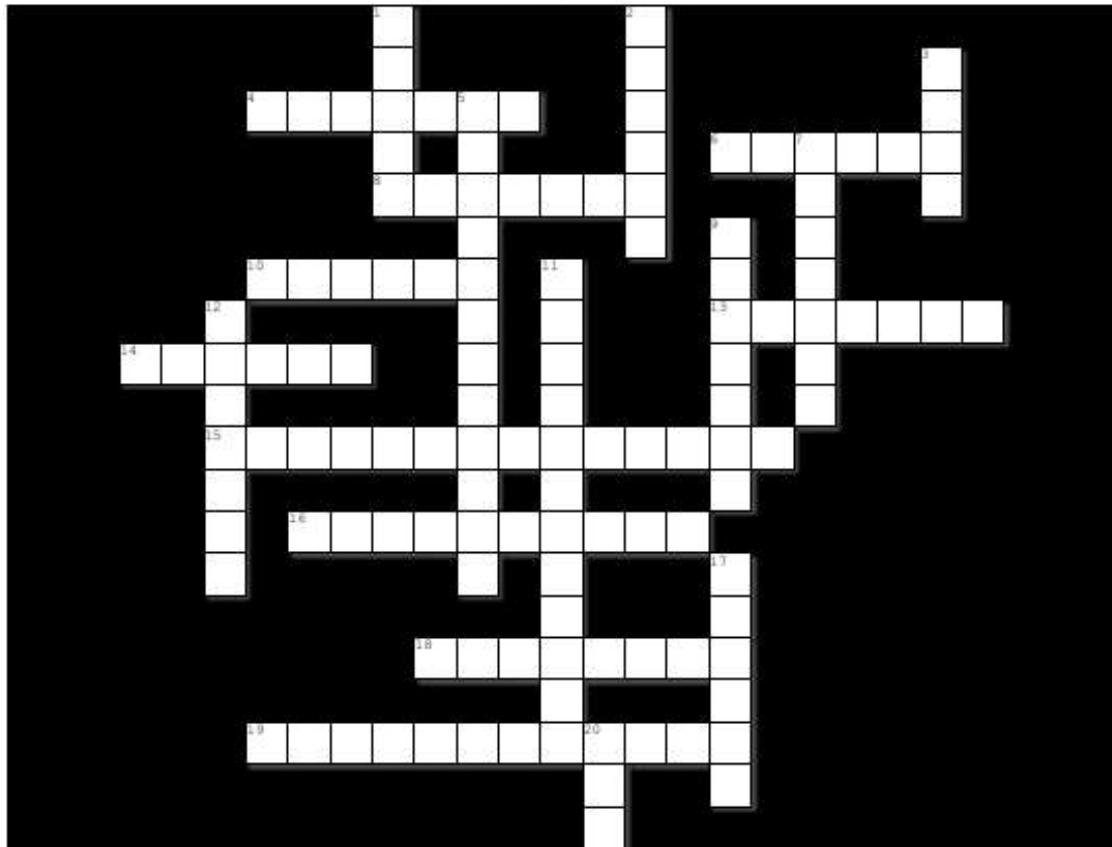
AYUSH- Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy

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## Crossword



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### Across

4. 2 DG is the analog of this sugar
6. Free/Libre and Open Source Software for Education
8. Robotics outreach project at IITB
10. e-Learning materials for students and teachers
13. Students' and Teachers' Holistic Advancement through Quality Education
14. National Massive Open Online Courses
15. Integrated scheme for school education
16. Gateway for e-books-government initiative
18. Integrated e-content portal under NME-ICT
19. e-journals-government initiative

### Down

1. Government statutory body
2. Expert Database and National Research Network
3. Central Institute of Educational Technology
5. Educational TV Channel-government initiative
7. E-Governance for Institutions/Universities
9. World's largest teachers' training programme - government initiative
11. Plagiarism Detection Software--government initiative
12. One Stop Education Portal-government initiative
17. World's largest Integrated Online Junction for School Education
20. National online storehouse for academic awards

**Solution on Page 93**

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## Wordsearch Solution on page 92

V A J B J X M C X D R U O Y P X K C C B  
N C R V U Y V I R T U A L L A B S T Y C  
A D O G C B U K K A Z J X J Y U E Z E T  
K H C P P Y S T P H I I Z T E Q I P F N  
I T S O S S V L D Z I J E I T O P G Z Q  
C Y Z N Y G A D D T W O O A N R U O E C  
R C N E A K G P P G R W E O O W M N Q M  
N B T A E R E U Z E U M S B M B F U H K  
P F Z S A F A D B W M M K A Y L Y O C W  
T Y H A M T R S Y F A R Y Z R C A Q K P  
E W T V K U G S G I N Y E J A P R B N B  
L F E H P F M O H W G K R R S S I E A M  
C Q O A O I J K M P M M M N M T T T R O  
M J L Y W N J P L R F D O G D D N S F N  
T F B U C Z X G B X T T H O Q B G P R K  
V D B G O T S M Y C E K X Z Y U K T I N  
R E Z S H H O F D R F W I M A R J D N J  
H P O A N C E R T A V R D B A L I C S D  
A L T D X H Y G M I G O Z Q K W H Z F B  
M T A N R U G A O A P M M N K V J Z X R

ARPIT  
JOOMLA  
NPTEL  
SARANSH  
UAY  
YUKTI

DRUPAL  
NCERT  
PMMMNTT  
SCILAB  
UMANG

EKALPA  
NIRF  
PYTHON  
TEQIP  
VIRTUALLABS

# Industry Roundup

10 March, 2021: AstraZeneca Pharma India Limited has received marketing approval for a once daily targeted oral pill, Tagrisso® (Osimertinib) for adjuvant treatment after complete tumour resection in patients with non-small cell lung cancer (NSCLC), whose tumours have epidermal growth factor receptor (EGFR) mutations. It has been reported that the drug decreased the risk of cancer recurrence by nearly 83 per cent in the ADAURA® clinical trial in early stage lung cancer patients.

08 April, 2021: USFDA has granted tentative approval to Aleor Dermaceuticals, joint venture of Alembic Pharmaceuticals for Abbreviated New Drug Application (ANDA) for Efinaconazole Topical Solution, 10%. The approved ANDA is therapeutically equivalent to the reference listed drug product (RLD), Jublia Topical Solution, 10%, of Bausch Health Americas, Inc. (Bausch). Efinaconazole Topical Solution, 10% is indicated for the topical treatment of onychomycosis of the toenail(s) due to *Trichophyton rubrum* and *Trichophyton mentagrophytes*.

23 April, 2021: US FDA granted Gland Pharma a Competitive Generic Therapy (CGT) designation for Foscarnet Sodium Injection, 6000 mg/250 mL (24 mg/mL) Single-Dose Bag for Infusion as it is the “first approved applicant” for such competitive generic therapy. The generic injection is the bioequivalent and therapeutically equivalent to the Reference Listed Drug (RLD), Foscavir Injection, 24 mg/mL, of Clinigen Healthcare. With this approval, Gland Pharma is eligible for 180 days of CGT exclusivity. Foscarnet Sodium Injection is indicated for the treatment of cytomegalovirus (CMV) retinitis in patients with acquired immunodeficiency syndrome (AIDS). It is also used for the treatment of acyclovir-resistant mucocutaneous herpes simplex virus (HSV) infections in immunocompromised patients.

30 April, 2021: US FDA has approved of a higher dose (8 mg) Naloxone Hydrochloride nasal spray product to treat opioid overdose. The newly approved product delivers 8 milligrams (mg) of Naloxone into the nasal cavity. Naloxone is a medicine that can be administered by individuals with or without medical training to help reduce opioid overdose deaths. If Naloxone is administered quickly, it can counter the opioid overdose effects, usually within minutes.

1 May, 2021: AstraZeneca’s FARXIGA (Dapagliflozin), a sodium-glucose cotransporter 2 (SGLT2) inhibitor, has been approved in the US to reduce the risk of sustained estimated glomerular filtration rate (eGFR) decline, end-stage kidney disease (ESKD), cardiovascular (CV) death and hospitalisation for heart failure (hHF) in adults with chronic kidney disease (CKD) at risk of progression.

6 May, 2021: ISSAR Pharmaceuticals, based in Hyderabad, has decided to license out their peptide-based new chemical entities (NCEs), with pre-IND filing and US Patent. In 2004, it was the first Indian company to conduct Phase-1 clinical trials, and launch the first ever indigenous peptide drug, Melgain in market for the treatment of Vitiligo. ISSAR’s commitment has also led to the development of their second new chemical entity called Xylentra, which is the first ever peptide drug in the world for the treatment of burn wounds and microbial infections.

21 May, 2021: Rousselot, a brand of Darling Ingredients, is global leader of collagen-based solutions expands. It has launched X-Pure GelDAT – Gelatin Desaminotyrosine, purified, pharmaceutical-grade, modified gelatins vital to the successful development of biomedical applications used in the human body.

24 May, 2021: Glenmark Pharmaceuticals has received USFDA approval for synthetic decapeptide injectable, Icatibant Injection, 30 mg/3 mL (10 mg/mL) Single-Dose Prefilled Syringe, the generic version of Firazyr Injection, 30 mg/3 mL (10 mg/mL) Single-Dose Prefilled Syringe, of Shire Human Genetic Therapies.

26 May, 2021: TLC, a Taiwan & US-based clinical-stage specialty pharmaceutical company and Zydus Healthcare Limited, part of Zydus Cadila group have signed a license supply and commercialization agreement to commercialize AmphoTLC™ (Amphotericin B Liposome for Injection 50mg) in India. TLC is involved in development of novel nanomedicines to target areas of unmet medical need. AmphoTLC™ is the first and only complex generic drug to have achieved bioequivalence to Gilead's AmBisome®. Under the terms of the agreement, TLC will manufacture and supply AmphoTLC™ on a non-exclusive basis to Zydus, and Zydus will commercialize AmphoTLC™ in India.

27 May, 2021: BDR Pharmaceutical has launched first affordable generic tablet of BDPARIB (RUCAPARIB), an oral, small-molecule inhibitor of poly (ADP-ribose) polymerase (PARP)1, 2, and 3 used as a monotherapy and in conjunction with other anti-cancer agents to treat advanced ovarian and prostate cancers.

04 June, 2021: Sanofi is partnering with the Breast International Group (BIG), the European Organization for Research and Treatment of Cancer (EORTC) and the Alliance Foundation Trials (AFT), to initiate a Phase 3 AMEERA-6 of Sanofi's amcenestrant, an oral selective estrogen receptor degrader in the adjuvant setting. The pivotal trial will investigate the efficacy and safety of investigational drug vs tamoxifen in female patients with estrogen receptor-positive (ER+) breast cancer who prematurely discontinued their adjuvant aromatase inhibitor (AI) therapy. Sanofi will provide funding and investigational drug product for the study which will be conducted by BIG in BIG Network and AFT in the US. The overall study and medical management as well as data analysis will be carried out by EORTC.

Source

1.<https://www.biospectrumindia.com/category/segments/pharma-biopharma>

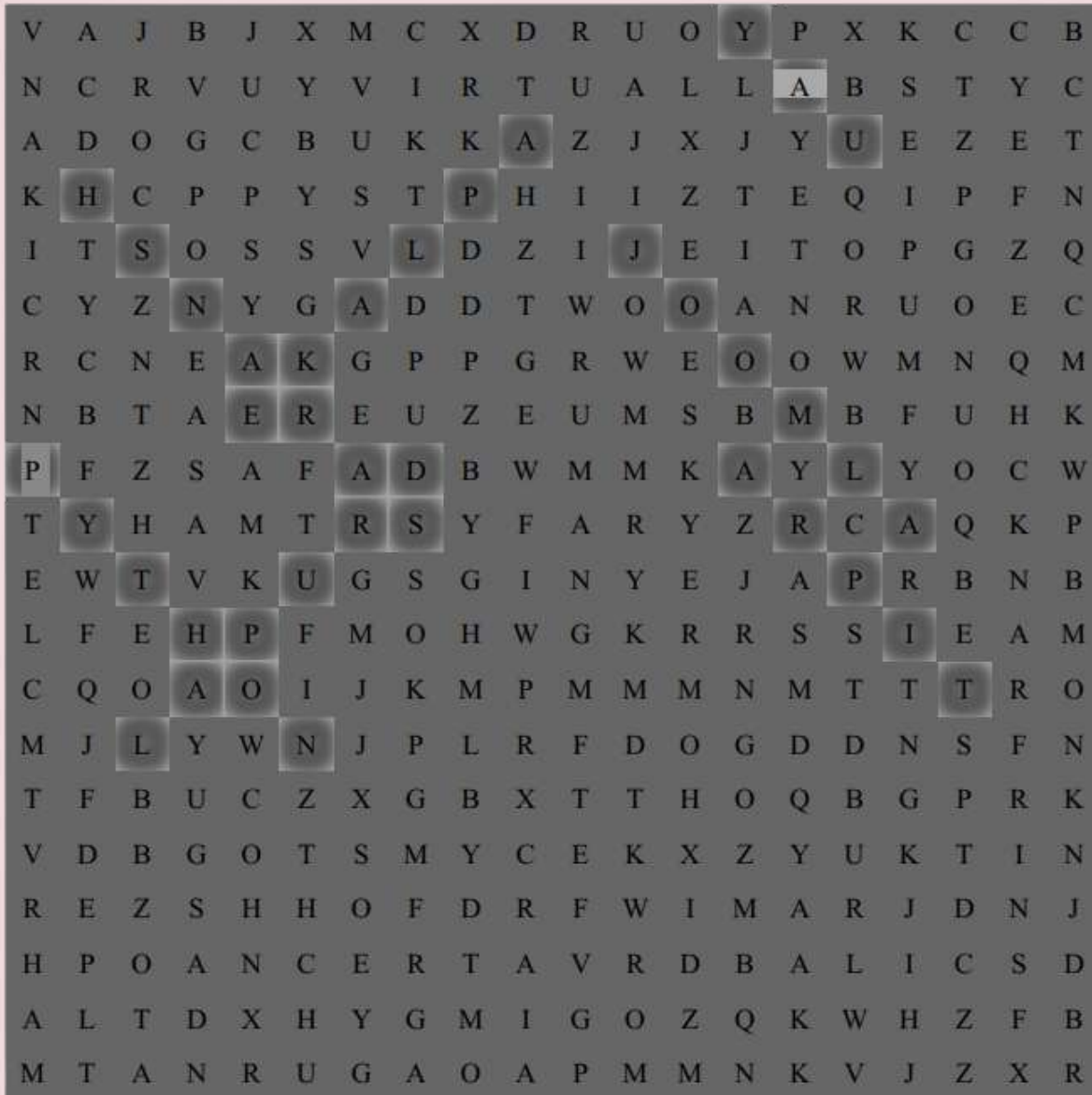
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**Contributor for this section: Dr. Clara Fernandes, Associate Professor, Department of Pharmaceutics, Bombay College of Pharmacy, Mumbai**

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## Wordsearch from page 89

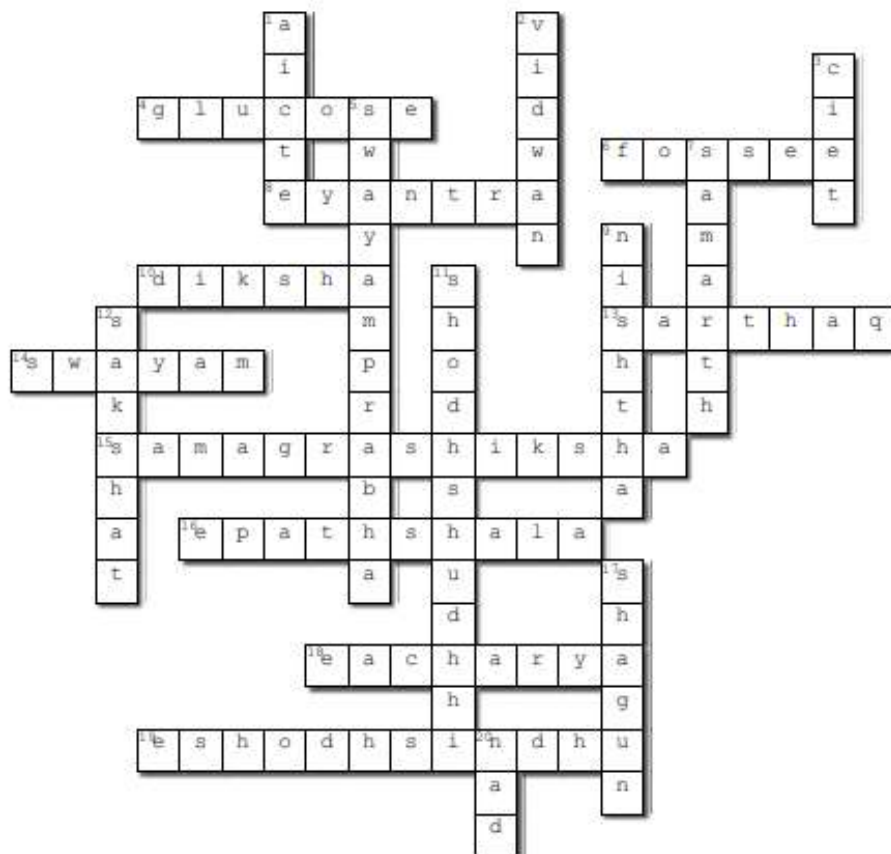


ARPIT  
JOOMLA  
NPTEL  
SARAN  
UAY  
YUKTI

EKALPA  
NIRF  
PYTHON  
TEQIP  
VIRTUALLABS

# Fun & frolic

## Crossword from page 88



Created using the Crossword Maker on TheTeachersCorner.net

### Across

4. 2 DG is the analog of this sugar (**glucose**)
6. Free/Libre and Open Source Software for Education (**fossee**)
8. Robotics outreach project at IITB (**eyantra**)
10. e-Learning materials for students and teachers (**diksha**)
13. Students' and Teachers' Holistic Advancement through Quality Education (**sarthaq**)
14. National Massive Open Online Courses (**swayam**)
15. Integrated scheme for school education (**samagrashiksha**)
16. Gateway for e-books-government initiative (**epathshala**)
18. Integrated e-content portal under NME-ICT (**eacharya**)
19. e-journals-government initiative (**eshodhsindhu**)

### Down

1. Government statutory body (**aicte**)
2. Expert Database and National Research Network (**vidwan**)
3. Central Institute of Educational Technology (**ciет**)
5. Educational TV Channel-government initiative (**swayamprabha**)
7. E-Governance for Institutions/Universities (**samarth**)
9. World's largest teachers' training programme - government initiative (**nishtha**)
11. Plagiarism Detection Software--government initiative (**shodhshudhi**)
12. One Stop Education Portal-government initiative (**sakshat**)
17. World's largest Integrated Online Junction for School Education (**shagun**)
20. National online storehouse for academic awards (**nad**)

# A Small Step to Bright Future – Glimpse of Government Initiatives for Education

A glimpse of government initiatives to revamp the Indian educational scenario.

**Virtual Lab:** The Virtual Labs Project is an interface developed for creating interactive simulation environment to perform experiments, collect data, and answer questions to assess the understanding of the knowledge acquired. This initiative provides remote access to Labs in various disciplines of Science and Engineering for students at the undergraduate level, postgraduate level as well as research scholars.

**SWAYAM:** The 'Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) is an integrated platform for offering online courses and covering school (9th to 12th) to Post Graduate Level. The online courses includes combination of (1) video lecture, (2) downloadable/printable reading material (3) self-assessment tests via tests and quizzes and (4) an online discussion forum for clearing the doubts.

**Samagra Shiksha** - an overarching programme for the school education sector extending from pre-school to class 12, intended to improve school effectiveness measured in terms of equal opportunities for schooling and equitable learning outcomes.

**SWAYAM PRABHA** - an initiative to deliver e-education across India through 32 high quality educational channels through DTH (Direct to Home). All the 32 channels are freely available on DD Free Dish, Dish TV (Zee TV) and Jio Mobile App

**National Digital Library of India**- a project executed by IIT Kharagpur to develop the overall framework of a facility that can provide a single window access to learners for e-contents/resources.

**e-Yantra**- a project executed by IIT Bombay for effective training of both, teachers and students on the basics of embedded systems and programming through workshops. e-Yantra also aids colleges in integrating robotics as part of training curriculum by setting up Robotics labs/clubs.

**FOSSEE** (Free/Libre and Open Source Software in Education) Project- an initiative by IIT Bombay to promote use of FLOSS (Free/Libre and Open Source Software) tools in teaching and research thereby minimize the dependency on proprietary software in educational institutions. Few of these tools include Scilab, Python, R, DWSIM, Open Modelica and Open FOAM etc.

**Spoken Tutorial**- a project by IIT Bombay which explores internet independent Free/Libre and Open Source Software to create a platform for self-paced, multilingual courses. It is an initiative by National Mission on Education through Information and Communication Technology (ICT), launched by the Ministry of Human Resources and Development, Government of India. The courses are available in 22 languages of the Schedule 8 of the Constitution, such as Hindi, Assamese, Bengali, Bodo, Gujarati, Kannada, Kashmiri, Malayalam, Manipuri, Marathi, Nepali, Oriya, Sanskrit, Punjabi, Tamil, Telugu, and Urdu. It is 10-minute long, audio-video tutorial, on open source software, to enhance employability of students.

**DIKSHA**- DIKSHA is an initiative of the National Council of Educational Research and Training (Ministry of Education, Govt of India). It is a digital platform developed to provide engaging learning material, relevant to the prescribed school curriculum, to teachers, students and parents.

**NROER**- NROER, National Repository of Open Educational Resources. NROER is developed by CIET, NCERT. It hosts large number of educational resources in many subjects and in different Indian languages for Primary, Secondary and Senior Secondary classes. Resources are available in different formats like Video, Image, Audio, Document and Interactive. It also provides opportunity to users to enroll in many open courses and online contests.

**e-ShodhSindhu** – It is an initiative being executed by INFLIBNET wherein access to current as well as archive to more than 10,000 core and peer-reviewed journals and a number of bibliographic, citation and factual databases in different disciplines from a large number of publishers and aggregators to its member institutions including centrally-funded technical institutions, universities and colleges that are covered under 12(B) and 2(f) Sections of the UGC Act.

**Manodarpan**- It is an initiative of the Ministry of Human Resource Development to mobilize Psychosocial Support to help university/college students/children, parents and the faculty to deal with the current circumstances and other issues in a comprehensive and multimodal manner.

**NISHTHA**- NISHTHA is a capacity building programme for "Improving Quality of School Education through Integrated Teacher Training". It aims to build competencies among all the teachers and school principals at the elementary stage. The functionaries will be trained in an integrated manner on learning outcomes, school based assessment, learner – centred pedagogy, new initiatives in education, addressing diverse needs of children through multiple pedagogies, etc.

**TALK TO TEACHER**- An initiative of the MHRD under the National Mission on Education through ICT. The portal provides free access to a few selected graduate and postgraduates courses taught at IIT Bombay by distinguished faculty member and scholars. These courses can be viewed absolutely free of charge at lower bandwidths on a personal computer/laptop having a headphone though internet connection.

**Source:**

<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1577240>

[https://www.education.gov.in/en/higher\\_education](https://www.education.gov.in/en/higher_education)

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<http://ess.inflibnet.ac.in>

<https://ndl.iitkgp.ac.in>

# Achievements

## **Priyanka S. Harer**

APTI member

received a research grant of Rs. 28.66 Lacs under Women Scientist Scheme-B of KIRAN DIVISION by Department of Science and Technology, New Delhi.

## **Dr. Sushama Talegaonkar**

published a book entitled "*Nanoformulations in Human health: Challenges and Approaches*" published by Springer Nature in 2020. She was also awarded with the "Distinguished Researcher award 2021" by Association of Pharmacy Professionals (APP) for her significant contribution in Pharmaceutical Research.

## **Dhanashree Mundhey**



was awarded with Ph.D. in Pharmaceutical Sciences by RTM Nagpur University. The topic of her research was "*Development of Novel sublingual formulation of opioid analgesics for pain management*" under guidance of Dr. Nidhi P. Sapkal. She is recipient of prestigious INSPIRE FELLOWSHIP from DST, Government of India for her doctoral research work. She is also a Gold medalist in her B. Pharm & M. Pharm degree from Nagpur University. She carried her research work at Centre for Advanced Research and Innovation, M/s ZIM Laboratories Ltd, Kalmeshwar, Nagpur. She shares the credit of her success with Dr. Anwar Daud, Managing Director, M/s ZIM Laboratories Ltd, Guide, parents, brother, husband, friends and family members.

## **Dr. Suvarna A. Katti**

Assistant Professor Department of Pharmaceutical Chemistry, M.G.V.'s Pharmacy College, Panchavati, Nasik

M.G.V.'s team, Akansha Shinde (S.Y.B.Pharm) Sonali Darekar (S.Y.M.Pharm) and Dr. Suvarna Katti (Mentor) won first prize in Hackathon competition organized by Savitribai Phule Pune University's Centre for Innovation, Incubation & Enterprise and Pimpri Chinchwad Startup Incubation Centre in INNO-FEST 2021 held on 6th March 2020. Their topic was 'Effective use and maintenance of Public Toilet specially for females'. The team was felicitated at the hands of Vice Chancellor of Savitribai Phule University, Prof. Nitin R. Karmalkar, Pro-Vice Chancellor Dr. N.S. Umrani, Mayor Pimpri-Chinchwad Municipal Corporation, Mrs. Usha Dhore. The team was felicitated with seed money of 3 lakhs for project by PCMC. General Secretary of M.G.V. Hon. Prashant Hiray, Co-Ordinator Hon. Dr. Aapoorva Hiray, and Principal Dr. R.S. Bhambar congratulated the team for their grand success.

## Poona College Of Pharmacy's "BHARATI PCP SAKHEE TEAM" Bestowed with AICTE LILAVATI AWARD 2020



"Bharati PCP Sakhee" team of Poona College of Pharmacy Bharati Vidyapeeth (Deemed to be University) Pune, has been bestowed AICTE "Lilavati Award 2020" under the category 'Women Health' as first runner up with Rs. 75,000/- Prize on 11th April 2021 at the hands of Shri. Ramesh Pohkriyal, Union Cabinet Minister for Education, Govt. of India at New Delhi. The Bharati PCP Sakhee team was headed by Dr. Varsha Pokharkar and the team members were Dr. Arulmozhi. S, Dr. Asawari Raut, Dr. Savita Gowekar and Dr. Manjush Sajith.

"Bharati PCP Sakhee" team received this award in recognition of their contribution for betterment of Women's Health including both rural and urban girls and women through various activities:

- Hemoglobin checkup and counseling for girls
- Health screening for women farm laborers
- Screening and counseling of pregnant women
- Research on formulation development for treatment of breast cancer
- Counseling on sanitization, hygiene and menstrual health
- Distribution of sanitary pads to the rural adolescent girls
- Promotion of health of young girls through sports activities and training in yoga

Hon. Chancellor Prof. Dr. Shivajirao Kadam, Pro-Vice Chancellor Hon. Dr. Vishwajeet Kadam, Vice Chancellor Hon. Dr. Manikrao Salunkhe, and Dr. Atmaram Pawar, In-Charge Principal of Poona College of Pharmacy have congratulated and appreciated the efforts of "Bharati PCP Sakhee" team.

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VANDANA B. PATRAVALE

(For correspondence: editor.aptiwomensforum@gmail.com)

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### **LOTUS LOGO STORY**

As a lotus is able to emerge from muddy waters un-spoilt and pure it is considered to represent a wise and spiritually enlightened quality in a person; it is representative of woman who carries out her tasks with little concern for any reward and with a full liberation from attachment. Lotus-woman in the modern sense of women's qualities: she is superbly intelligent, highly educated, and totally committed to individualism. She is politically astute and works incessantly for a better and more humane society. She is exquisite in her taste for music, art and culture, abounds in social graces and performs brilliantly in communication.