



# Digitalization of Education under NEP, 2020: Prospects and Challenges

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Date of Submission: 03-08-2023

Date of Acceptance: 15-08-2023

## Abstract:

Digital education is the way forward, seeking education through the means of technology and digital devices. Digital education enhanced the learner's comfort in every nook and corner of the country. The present age is a digital technology-driven age, and the internet age is influencing the whole world. Digital education is also known as an e-learning platform. Digital education has replaced the traditional concept of chalk and talk. This is a broad concept that helps any student attain knowledge and gain information from far-flung areas. During the COVID-19 pandemic, the entire education system was digitalized. The digitalization of education is a revolutionary reform in the education sector. Through digital education, students can get easy access to recorded audio and video lectures. NEP 2020 recommends that every education institution create a digital repository of content that includes coursework and activity-based learning material. By 2030, NEP 2020 will have enhanced the inclusive and equitable education system. This policy further recommends that an autonomous body, the National Education Technology Forum (NETF), be created to provide a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning and administration both for school and higher education.

The Digital Infrastructure for Knowledge Sharing (Diksha) platform offers access to download digital textbooks, e-content from NCERT, question banks, and so on. NEP 2020 also recommends the Academic Bank of Credits, which facilitates the transfer of credits between students. This policy facilitates multiple entry and exit options in higher education, whereby students can exit after one year with a certificate, after two years with a diploma, and after three years with a bachelor's degree. No doubt, the digitalization of education is very useful and significant, yet it is facing many problems due

to a lack of or poor internet connectivity in rural areas, technological glitches or the digital divide, environmental infrastructure and social interactions. Digital skill acquisition, stable internet and proper motivation enable students to surmount these difficulties. Above all, the future will depend entirely on digital education. Sharing is good and with digital technology, sharing is economical, easy and equitable. As the topic is very interesting, relevant and of concurrent significance, therefore an attempt has been made in this paper to define the concept of the digitalization of education, its main features and its process. Besides, provisions regarding it under NEP, 2020, along with the main challenges and suitable remedies, have been discussed.

**Keywords:** Digitalization, National Education Policy, ICT, e-learning, Digital divide, Artificial Intelligence.

## I. Introduction:

The creation of digital infrastructure, digital service delivery, and digital literacy are the three main pillars of the "Digital India" initiatives. The idea of digital learning is not new and has been existed in various forms for many years, but after the covid pandemic interrupted face-to-face learning, its importance increased significantly. Online education has become a necessary component of our life after the COVID-19 pandemic. With the use of online learning and teaching elements, institutions have made steps to digitally transform not just their processes but also their educational offerings. E-learning has been for a while, but NEP 2020 makes it a requirement for educational platforms. Education systems in schools and higher education institutions have changed as a result of the advent of new technology-assisted learning tools like tablets, MOOCs, smartboards, and virtual laboratories. Online education is a particular priority of the NEP 2020. Pilot research



projects will be carried out by universities and institutions like NITs and IGNOU to maximize the advantages of digital learning in India. The training materials, classroom resources, assessment tools, profiles, and other online tools and platforms like DIKSHA and SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) will be revised with new information to enable smooth interaction. The Digital Infrastructure for Knowledge Sharing (Diksha) platform offers access to download digital textbooks, e-content from NCERT, question banks, and so on. NEP 2020 also recommends the Academic Bank of Credits, which facilitates the transfer of credits between students. This policy facilitates multiple entry and exit options in higher education, whereby students can exit after one year with a certificate, after two years with a diploma, and after three years with a bachelor's degree. As we know that the existence of a vast economic disparity in India also forced it to concentrate on the building of public digital and interoperable infrastructure that can be used by multiple parties.

Access to online education is still difficult for many people. Sustainable Development Goal IV (SDG 4) of the United Nations clearly emphasizes that the main aim of the educational system should be that of serving "Quality Education" and it has given a full understanding of the specific actions to be taken by all the nations by 2030 to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"<sup>1</sup>. The focus of the Global Agenda SDG 4 is to raise the standard of living and quality of life by ensuring quality and lifelong education irrespective of region, race, religion, colour, caste etc. Accordingly, in India, there is an emphasis to achieve global targets and more importantly, this is due to the necessity of fulfilling the government's goals of overhauling its education system.

### Objectives of the Study:

As the topic is very interesting, relevant and of concurrent significance, therefore an attempt has been made in this paper to define the concept of the digitalization of education, its main features and its process in India. Besides, provisions regarding the digitalization of education under NEP 2020, along with the main challenges and suitable remedies, have been discussed.

### Concept :

Digitalization is the conversion of analog information into texts, photographs, and voices, among others. The transformation is carried out

through electronic devices such as scanners or specialized computer chips. Information is organized into bits which can be separately categorized into bytes. This serves as the binary data that computers can process. Digitalization is done to process, store, and transmit the information through digital circuits, equipment, and networks. It makes easier to access, preserve and share information. It is essentially a process of converting everything into digital format. Ultimately, digitalization aims to ease lives and create a more self-reliant business model that promises standardized quality and cost-efficiency. Thus digitization is the process of converting information into a digital format by which the information is organized into discrete units of data called bits that can be separately addressed, usually in multiple-bit groups called bytes.<sup>2</sup>

Digitalization in education refers to the use of desktop computers, mobile devices, the Internet, software applications, and other types of digital technology for the teaching learning purpose of students of all ages.<sup>3</sup> Digital education in India has emerged as a transformative force. It has revolutionized the way knowledge is imparted and acquired. Digital learning has gained momentum across the country particularly during and after the COVID-19 period. This is owed to the rapid advancement of technology and increased access to the internet.<sup>4</sup>

### Objectives for Digitalization of Education :

The motto of Digital India Mission in the 21st century is "Power to Empower". The main objectives for the Digitalization of Education in India vis a vis NEP, 2020 are as under :

- To develop tools and resources that are appropriate for supporting educational objectives.
- Created an educational technology model that enhances the current teaching and learning process.
- Address the main environmental restrictions.
- Comprehend the goals, tactics and organizational structure of education.
- Create curricula that incorporate human values, science and the arts.
- Establish clear behavioural learning objectives for the classroom.
- Comprehend and arrange the lesson's material in a sensible order.
- Be aware of the resources and materials currently available for teaching and learning.



- Determine how different sub-systems, such as teachers and pupils, interact with one another.

### Use of ICT in Education :

Western nations are where the idea of information and communication technology (ICT) was created to support and improve the dissemination of knowledge. To communicate information more effectively, ICT has been widely used in Indian culture and governance since the last decade of the 20th century. ICT has significantly changed the education sector, increasing learning's interactivity, interest, and accessibility. The use of ICT in teaching and learning has also been emphasised by Indian higher education institutions including the UGC, universities, and colleges. We can divide the essential tools of modern e-learning systems into two parts i.e. a) Hardware (Mobile, Tablet, Laptop etc.) and b) Software ( Mail account, Google Drive, Google Form, YouTube etc.).<sup>5</sup> A visit to India, recently, to explore new partnerships with academia and the industry reported the highest growth for new online learners globally, between 2019 and 2021 about 15 million joined Coursera programmes since January 2020. The maximum enrolments were from Manipur, Bihar, Andaman and Nicobar Islands, Kerala, Himachal Pradesh and Arunachal Pradesh. Together, non-metros added up to 62% at the end of 2021, in contrast to 2019 when 68% were learners from Delhi- NCR, Karnataka, Tamil Nadu, Maharashtra and Uttar Pradesh” . “ India loves education, with a focus on career; the idea is to advance content and credential innovations and align it with job opportunities in the digital economy.” Women are also embracing online learning. From 37% in 2019, they represented 44% of new learners in 2021. Sought-after courses include Computer Programming, Machine Learning, Probability and Statistics, Theoretical Computer Science, Business and Personal development skills such as Communication, Leadership, Management and Entrepreneurship, Data Science and Programming, the Science of Well-being and English learning for career development.<sup>6</sup>

### Process of E-Learning:

Several initiatives have been taken to enable online education in India such as:

#### 1. e-Pathshala Portal

It was introduced in November 2015 after being jointly started by the Ministry of Human Resource Development, CIET, and NCERT. The e-Pathshala portal was introduced to create a resource hub for instructional flipbooks, audiobooks, films etc. Smartphones, laptops, desktop computers, and

tablets can all access the portal's resources, which are available in multiple languages. The app is very small (less than 7 MB) and uses very little memory. There are no fixed fees, no printed books, no separate school building, no benches or chairs, no blackboards, no system of separate classes, no attendance registers, no annual examinations, and no regular timetable. For classes I to 12, NCERT has posted 1,886 audio files, 2,000 videos, 696 eBooks, and 504 flipbooks in a variety of languages to e-Pathshala.es. 2,000 films, 696 eBooks, and 504 flipbooks in a variety of languages have also been uploaded.<sup>7</sup>

#### 2. SWAYAM

To provide all citizens, especially those from poor backgrounds, with an integrated platform for online courses at reasonable prices, the government developed Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) in 2017. Students from Class 9 to 12, as well as Undergraduates and Graduates, can access quality education in a variety of disciplines through the portal's Massive Open Online Courses (MOOCs). On the e-learning platform SWAYAM, 43 Massive Open Online Courses (MOOC) are available in India.<sup>8</sup>

#### 3. SWAYAM PRABHA

In 2017, SWAYAM PRABHA, a group of 34 DTH (Direct-to-Home) channels dedicated to broadcasting educational programmes 24x7, was introduced. The channels broadcast new content for a minimum of four hours every day, and this is repeated five times on the same day for students to select a convenient slot. Every day, there will be new content for at least 4 hours which would be repeated 5 more times a day.<sup>9</sup>

#### 4. DIKSHA

The government unveiled Digital Infrastructure for Knowledge Sharing (DIKSHA) in September 2017. It provides students, teachers, and parents with curriculum-based engaging learning materials, and a nationwide portal for school education, in September 2017. The portal has been adopted by 35 states and UTs and supports 33 Indian languages. 6,477 Energized Textbooks developed by states/UTs and NCERT 2,91,168 pieces of e-content are live on DIKSHA as of date. Till date, there are 15 Crore enrolments in various courses on DIKSHA for the courses offered by various states and UTs, including various centers<sup>10</sup>

#### 5. NISHTHA

To create modules for online education, the National Initiative for School Heads and Teachers' Holistic Advancement (NISHTHA) launched under the Centrally Sponsored Scheme of Samagra Shiksha



Abhiyan in 2019-2020. This integrated programme aims to build the capacities of around 42 lakh participants covering all teachers and Heads of Schools at the elementary level in all Government schools, faculty members of State Councils of Education Research and Training (SCERT), District Institutes of Education and Training (DIET) as well as officials and Resource Persons from Block Resource Centres (BRC).<sup>11</sup>

### 6. PM e-VIDYA Program

To promote and develop digital education in India and to make e-learning more accessible for Indian students and instructors, the government launched the PM eVIDYA programme in May 2020. The programme will reportedly help 25 crore school kids and intends to bring together all online and digital education-related activities. The programme also includes creating original digital content for students who are blind or deaf as well as providing radio/podcasts and QR-coded digital textbooks to students in classes 1 to 12 via the DIKSHA portal.<sup>12</sup>

### 7. Blended Mode Of Learning

NEP 2020 clearly states that schools should not overlook the importance of face-to-face, in-person learning while promoting digital learning and education. Accordingly, different effective blended learning models should be offered for appropriate replication for different subjects. Mention it in light of NEP,2020 i.e. 40 per cent of courses should be developed and provided in online mode as per UGC guidelines. According to data published by the Department of Education, 6,867 or 58.69 percent of the 11,701 private schools at the basic education level are still using blended learning, while 4,578 or 39.12 per cent have face-to-face learning (DepEd).

### 8. Virtual Labs

To improve the learning experience of undergraduate and graduate students (pursuing science and engineering courses), the Government of India launched a pilot virtual lab in 2009 and a full virtual lab in 2010. A Learning Management System, as well as various study aids like video lectures, online resources, self-evaluation, and animated demonstrations, are available to students in the virtual labs. In addition, to digital initiatives the government has undertaken Free and Open-Source Software for Education (FOSSEE).

**9. IIT Pal:** On the National Testing Agency's official website, students can receive lectures on physics, chemistry, mathematics, and biology if they are interested in receiving online coaching for the IIT admission exams.<sup>13</sup>

### Types of Equipments of Digitalization:

The improvement of learner outcomes is the main objective of using digital technologies. Innovative and purposeful use of technology is changing how teachers educate students and how students learn in classrooms.

#### 1. Interactive Smartboard

A Smartboard is an interactive whiteboard that lets you write on it and reposition objects with your fingers. Typically, a computer is attached to it as a screen mirror to enhance viewers' vision.

#### 2. Digital Textbooks

A digital textbook, often known as an e-textbook, is the electronic version of a physical textbook that is frequently used in online and hybrid classes. Teachers adore using digital textbooks in place of traditional ones because they are easier for students to use. They don't have to carry heavy books to class every day and can store hundreds of other books, hence typically boosting student productivity, accessibility and economy by encouraging greater interaction with the material being studied.

#### 3. Projectors

The classrooms at the school may benefit greatly from the acquisition of an overhead projector (OHP). The first benefit is that pupils can observe teacher presentations more clearly and enlarged, and they will be able to provide class presentations more quickly.

#### 4. Headphones

The most valuable purchase a school can make to own valuable technology is a pair of headphones. They are excellent for speaking exercises, listening exercises, and even just watching instructive movies.

#### 5. Internet connectivity

Without question, having access to the internet is what allows society to function today. The classroom serves as a similar medium. Having internet access in the classroom provides several advantages for both the teacher and the students.

**6. Learning Management Systems (LMS):** LMS are web-based software platforms that give teachers the ability to organise and manage online learning tasks like creating and delivering courses, monitoring student progress, and carrying out evaluations.

**7. Video conferencing:** Students can now engage in conversations from far-flung areas, connect with teachers and classmates, and attend virtual classrooms due to video conferencing facilities.

#### Significance of AI in the Education Sector :

Artificial intelligence (AI) is advancing significantly in the field of education, opening up new possibilities for efficiency, data analysis, and



individualised learning The following are some of the main advantages of AI in education:

**1. Personalized education:** AI algorithms may evaluate the learning styles, aptitudes, and weaknesses of each student to offer individualised suggestions for readings, study plans, and assessments.

**2. Intelligent tutoring technologies-**AI-powered tutoring systems can offer students interactive and adaptive learning opportunities, giving them immediate feedback and adjusting to their unique learning requirements.

**3. Automating administrative tasks:** AI can automate administrative activities like scheduling, grading, and attendance monitoring, giving teachers more time to concentrate on teaching.

**4. Predictive analytics:** AI algorithms can analysis student data to predict academic performance and identify students at risk of falling behind, allowing educators to provide early interventions and support. Overall, the importance of AI in education is in giving students access to more individualised, flexible, and effective learning experiences. This empowers teachers to better help students and get insights into their learning patterns. AI will now be included in the Indian school curriculum as a part of the NEP 2020. Although the AI system is undoubtedly quite essential in the contemporary era, there are still many challenges to its smooth functioning such as a lack of human availability, limited state capability, and lack of comprehensive policy. According to research on artificial intelligence in the educational sector, just 46% of the population can access the Internet. 85 per cent of teenage girls in the nation do not have a laptop at home, and 83 per cent spend less than an hour each week using computers in their classrooms.<sup>14</sup>

#### **Technology as a Saviour:**

Technology-based teaching-learning modules have brought revolutionary changes in the Indian education system and it has wide scope and utility not only for the regular and formal mode of education but can be very useful to all those who are deprived and residents of far-flung areas that too at a very economical rate and wider opportunities in terms of variety. The followings are the merits of the uses of technology in education

#### **1. Flexibility Increases**

The National Educational Technology Forum (NETF), an autonomous body, that will be established under the National Education Policy(2020), will serve as a forum for the free exchange of ideas on the use of technology to improve learning, assessment, planning, and administration for both secondary and higher

education. The NETF's goal is to make it easier for leaders of educational institutions, State and Central governments, and other stakeholders to make decisions about the introduction, deployment, and use of technology by giving them access to the most recent knowledge and research as well as the chance to network and exchange best practises.

#### **2. Enables the Student's Mobility**

Through the Academic Bank Credit (ABC) system, technology in higher education facilitates student mobility. Credits awarded to a student for one program from an institution may be transferred to another institution upon the student's consent. The credits that are kept in each student's accounts will provide them with a lot more flexibility in choosing their academic and career paths. The students will have the option to leave their institute at any time during any year or semester and, if qualified, exchange their earned credits for a certificate or diploma. They will also be able to use the credits to re-enroll in the same school, another school of their choosing, at the same time, or a later date, continuing their education from the year or semester they are now in. ABC has been established on the lines of the National Academic Depository (NAD), in the sense, NAD is the backbone of ABC.<sup>15</sup>

#### **3. Promote Cooperation and Collaborative learning**

With the ongoing digital revolution, join a wave of communication and collaboration efforts to bring out the best in the education sector. Technology facilitates tasks like holding meetings online from any location, working together on documents, brainstorming ideas, sharing documents, and even explaining ideas using a whiteboard.

#### **4. Constrains Human Error**

Digital initiatives eliminate human error and guarantee the development of automation building blocks that the current education sector may use.

#### **Challenges:**

Before beginning the process of digital transformation, one must have a digitization strategy in place; otherwise, problems will arise. To sustain an organisational structure and hierarchy throughout the entire process for a sector like education, professional and planned activities are required. Trying to realise one's full digital potential may be hindered by financial limitations. A mismatch between the primary quality objectives and the target deadlines set to achieve them could be another disadvantage for schools.

Cyber risks are one of the main issues affecting educational institutions' objectives for the digital revolution. Other potential problems could include a



lack of specialised digital skills, a failure to recognise how the needs of the education sector are evolving, a lack of digital competencies of teachers to meet further needs, and a failure to take adequate steps to assure universal access. While attempting to realise one's full digital potential, financial limitations may become an obstacle. A mismatch between the main quality goals and the target deadlines for achieving them could be another disadvantage for school risks are one of the main issues affecting the goals of the digital transformation in education. Other potential problems could be a dearth of specialised knowledge in the digital sphere, a failure to recognise how the needs of the educational system are evolving, or a lack of adequate measures to guarantee universal access. With 550 million people, India has the highest population in the world between the ages of 5 and 24 years and according to a recent Ministry of Education (MoE) report, India has the largest education system worldwide. Unfortunately, India still has a long way to go in terms of ensuring universal access to high-quality education and reducing disparities in access to it. The unequal distribution of opportunities based on social class, gender, and caste has made the education gap worse. Due to the prolonged use of a computer or mobile device, younger students are more prone to experience eye-health problems. Are teachers prepared for Artificial Intelligence (AI) in the classroom is one of the greatest issues? The majority of teachers are uncomfortable with this technological advancement.

The NEP 2020 focuses on online and digital education. Although there are numerous advantages to digital education, like unmatched access to high-quality education, its implementation has problems that could jeopardise the success of any online course. Online learning is also complicated by a lack of computer literacy. These are the challenges that digital education must overcome.

1. The phrase "digital gap" refers to a divide in digital literacy, where some people are familiar with and regularly use digital devices, while others are not. Only 4.4% of households in rural India have computers as against 23.4% of urban households.<sup>16</sup>

2. Many educators are delivering knowledge without having adequate accreditation of their learning material, which has raised concerns about quality learning with the rise of multiple learning platforms.

3. There are three socio-economic categories used to categorise people in India. In contrast to individuals in lower socio-economic categories, those in high and middle socio-economic classes are accustomed

to and at ease with the integration of technology and electronic devices.

4 We are currently endeavouring to walk the digitalization of the learning path while our educational system continues to struggle with the foundational learning infrastructure. For decades, our government has been seeking to allocate 6% of the GDP to education, but it has been unsuccessful. A reliable electrical infrastructure is necessary for digital and online learning.

5. Unavailability of open and public digital resources infrastructure is also a serious constraint in the Digitalization of Education in India.

### Conclusion and Suggestions:

It is evident that NEP 2020 provides a fresh canvas to paint on and opens up avenues for home-schooling and foreign universities alike, in India. For the new policy to succeed a combination of a staunch intent to move out of comfortable doldrums and facilitate increased involvement of foreign universities and increased literacy levels is a must. While this objective is expected to see significant regulatory overhaul for its successful implementation, it would lay a successful path ahead for institutions. It describes the ideal education for future generations and will be a crucial instrument in creating an India that is "self-reliant." The Policy also presents a significant opportunity for cooperation between the various industry stakeholders and regulatory authorities/educational institutions. In this regard, the Internet and Mobile Association of India has recommended a partnership between the ed-tech industry and NETF which will help to streamline research and enable the NETF to adopt industry-led best practices. Higher Education Institution under NEP 2020 plays an active role in researching disruptive versions of instructional materials courses including online courses and assessing their impact on specific areas.<sup>17</sup> Universities will aim to offer Ph. D. and Masters programmes in core areas such as Machine Learning as well as multidisciplinary fields and professional areas like health care, agriculture, and law. Digital learning has generally been a blessing during the age of the covid pandemic. Thus covid-19 period has opened new vistas and sped up the process of digitalization in India. The equitable distribution of digitalization in schools should be mandated by the central and state governments through budgetary provisions, which will significantly reduce the digital gap. The workload of teachers will also be lightened as a result of budgetary measures, which will also relieve them of the strain of finding funding sources. The levels of digitalisation should



aim to identify the existing strengths along each dimension, indicate how these strengths can be augmented and utilised, and point to areas for improvement. This will require establishing a sustainable and effective monitoring and mentoring mechanism for the digitalisation of education. To maximise the potential effects of digital transformation, integrate each aspect gradually and apply it one at a time.

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