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# NEP 2020 and the Infrastructure for ICT-based Teaching Learning

**Dr. S. Prathap**

Teaching Assistant, Dept of Adult, Continuing Education and Extension,
Sri Krishnadevaraya University, Anantapur 515003 (AP)

**Abstract**
The globe now is attempting to recover from the devastating effects of the Novel Coronavirus Disease pandemic (COVID-19). The propagation of this rare disease across the world has altered every aspect of existence. It completely changed the paradigm of education, converting traditional classroom settings to virtual ones. One of the foremost important laws of the twenty-first century is the National Education Policy (NEP), which was written in 2019 and endorsed by the Indian Union Cabinet on the 29th of July in 2020. The policy is ground-breaking and comprehensive in every way, with a focus on several elements of education, including the incorporation of ICT. The NEP 2020 places a lot of emphasis on integrating technology because it can be a key element in fostering all-encompassing development. The creation of virtual labs is also given considerable attention in NEP 2020. It is important to note here that a National Educational Technology Forum (NETF) is likewise in the process of being founded. Despite widespread support for using ICT in teaching and learning, there were still some issues with classroom integration. Several crippling problems emerged, among them are inadequate ICT infrastructure, institutional discouragement, slack policies, and—above all—, insufficient technological, pedagogical, and integrative abilities among teachers at all levels. In addition to highlighting NEP 2020's key points and different ICTrelated provisions for teaching and learning, this paper also discusses several implementation issues and infrastructural requirements for ICT. Finally, several recommendations are made for the optimum utilization of ICT.

**Keywords:** National Education Policy (NEP) -2020, Information and Communication Technology (ICT), National Educational Technology Forum (NETF)

## Introduction:

Education is definitely the keystone and the pillar of the growth of a community and a nation. Without providing education to all of its residents, regardless of class, ethnicity, caste, or area, a nation cannot thrive. Education is a prerequisite tool for preparing people for their responsibilities and making them aware of their rights. Education equips and trains future generations for a better future. In the twenty-first century, all societies have evolved into information-intensive societies as a result of advances in science and technology. NEP 2020 is seen as a ground-breaking move in the improvement of education. The utilization of technology in teaching and learning is one of the policy's main concerns. NEP 2020 states that the Ministry will focus on establishing digital content, digital infrastructure, and resource building to meet the demands of higher education and the classroom in terms of e-learning. The

principles proposed by NEP 2020 are progressive. It has acknowledged how technology may advance education because it is so effective at facilitating teaching and learning.

The creation of infrastructure, online teaching platforms, and technological tools have all received special attention in accordance with the recently implemented education policy. A lot of focus has been placed on training educators because there is also a big need for teachers who are comfortable using technology. It will not be possible to generate online curricula or online evaluations if educators are not tech-savvy India leads the world in ICT and other cutting-edge fields like space. All stages of education have a reciprocal relationship with technology - extensive use of technology in educational planning and administration, the removal of language obstacles, and the facilitation of access for Divvying students. The Digital India Campaign is assisting in the transformation of the entire country into a knowledge-based society and economy. The development of educational practices and results will heavily rely on educational technology.

ICT integration in education gives students, teachers, and administrators a better opportunity to collaborate in the present educational environment. (Russian A., 2020).

ICT has caused a change in the methods used for higher education's instruction, learning, research, and expansion operations. The time gap between the generation of knowledge and its consumer usage has decreased because of ICT, assisting in overcoming the limitations of space and time. The manner in that students are learning now has changed as a result of the information and communication integration in the classroom. With the use of ICT tools, teachers in India are also experimenting with creative teaching methods. They use a variety of digital platforms to organize their lectures, deliver them virtually or in a traditional classroom setting, and carry out assessments.

With the use of educational technology, it is now possible to communicate with various learner types and provide several avenues for understanding assessment. Well-prepared teachers with access to ICT assets are among the most important factors in the success of instructional and educational technology. The Indian government has been steadfast in putting regulations into place to support technological developments in the educational field and to encourage teachers to use and incorporate ICT. Although Indian instructors have a good attitude toward using ICT, additional infrastructure and training are still needed, particularly in rural areas. The following paper will go over how technological advances has altered instructional strategies, how instructors feel about using technology in the classroom, and how this has affected their professional growth. Significance of the study:

This study helps in highlighting the ICT infrastructure requirements as ICT, particularly computer and Internet technology, can facilitate innovative approaches to teaching and learning as opposed to merely enabling educators and learners to continue as before. This paper also outlines the necessary actions that can be implemented in accordance with NEP 2020 standards to combat the current problems.

**Objectives:**

- To critically analyse the infrastructural requirements of ICT
- To study the NEP 2020's diverse ICT-related aspects for teaching and learning.
- To investigate the obstacles to ICT adoption in accordance with NEP 2020.
- Future enhancement approaches for the effective blending of ICT with teacher preparation.

**Research methodology:**

This exploration is a descriptive study. The required secondary data was gathered from a variety of websites, such as the Indian government's periodicals, magazines, and other publications. A large number of academic articles on the subject of NEP-2020 and ICT were reviewed using a variety of databases. The implications and findings were reached after this data was examined and assessed.

**Information and Communication Technology:**

ICT stands for information and communication technology. It is defined as the application of technology, such as computers and software, to information processing and transmission to process information in addition to converting and storing it.

**All digital tools, content, resources, forums, and services, as well as those that can be converted into or delivered through digital forms, can be used to realize teaching-learning objectives, improve access to and reach of resources, the development of capacities, as well as management of the educational system, are referred to as ICT in the national policy on ICT (NCF 2005).**

ICT includes a broad range of technological methods for locating, gathering, organizing, producing, and distributing information and data. ICT includes a wide range of technologies, including telecommunications systems like computers, cable, satellite, TV, radio, and computer-mediated conferencing and videoconferencing, as well as digital technologies like computers, software, and information networks (internet, intranet, and global web). Put another way, ICT emerged as a result of the digital convergence of computers, telephony, and other media communication technologies.

**ICT Infrastructure:**

The ICT infrastructure is just as crucial as the more traditional forms of basic technological infrastructure, like transportation and power. ICT has spread widely and helped to bring in a brand-new era of education, learning, and research. ICT has had an impact on library and information services in a similar way4. Computers, networks, the internet, information systems, software, and screen techniques and accessories make up the majority of ICT. It has been suggested to use rubrics (a collection of categories that define and characterize the key elements of the regions being evaluated) to evaluate ICT infrastructure. One of the crucial elements in the implementation of an ICT program is the availability of infrastructure facilities. It is necessary to upgrade the existing infrastructure in educational institutions in order to adopt ICT successfully and without any obstacles. The program won't be successful without the necessary infrastructure, including power, a suitable location for the center, communication, computer-related supplies, and human assistance. Therefore, all of these facilities must be present before the ICT education program can begin.

**The technical components include: (MHRD, 2010)**

1. ▪ Infrastructure elements, such as electrical wiring and fittings, electrical safety, electrical conditioning, and electrical back-ups, such as gensets or other gadgets;
2. ▪ ICT laboratory preparation, such as civil works, securing equipment, furniture, lighting, ventilation, and fire safety;
3. ▪ Computers and accessories, such as printers, scanners, and projectors; Operating systems, security software (such as virus scan), and other software tools;

4. ▪ Internet connectivity, networking, cabling, access points, network management, maintenance, mandatory replacement of equipment and parts, and repair, as well as a mechanism for handling complaints,
5. ▪ ICT faculty compensation, an implementation plan that includes commissioning, installation, monitoring reports, and timetables,
6. ▪ An ICT program for students and teachers, capacity building for teachers, and assessment of teachers and students.

**Various provisions of NEP 2020 for ICT:**

Digital platforms are required for ICT-based educational activities in light of the recent rise in pandemics. NEP 2020 acknowledges significance of utilizing technology's benefits while also admitting its possible risks and perils in this area. To ascertain how the advantages of digital education might be enjoyed while addressing or drawbacks demands well-designed and appropriately scaled pilot studies. In order to address the current and upcoming obstacles to delivering high-quality education to all students, it is imperative to optimise and broaden the current digital platforms and continuous ICT-based educational initiatives.

1. In order to standardize training programs that can be delivered to numerous instructors in a short amount of time, NEP 2020 promotes online teacher training through the use of digital platforms such as SWAYAM/DIKSHA.
2. Technological innovations that assist teacher preparation and professional development, increase educational access, and improve admissions, attendance, assessments, and other administrative procedures in the field of education.
3. NEP 2020 states that all levels of pupils, including those in remote locations and Divyang students, will have access to instructional software for both teachers and students. The DIKSHA platform would host the e-content for teaching and learning created by all states in their regional languages as well as by NCERT, CIET, CBSE, NIOS, etc.
4. The National Educational Technology Forum (NETF) will be established to offer a forum for the unrestricted discussion of ideas about the application of technology to improve teaching, learning, assessment, planning, administration, and other aspects of school and higher education.
5. NEP 2020 states that schools would provide instructors with the appropriate ICT equipment so they may effectively incorporate e-content into teaching-learning activities.
6. NPE 2020 emphasized the need for teachers to receive the proper training and development for being effective online educators. A good instructor in a traditional classroom may not necessarily be a good instructor in an online classroom. NEP 2020 states that the Ministry will focus on creating digital infrastructure, digital content, and capacity building to handle the e-education needs of both school and higher education. We need experts to deliver high-quality e-learning in light of the rapidly advancing technology.

**Challenges for implementation of ICT as per NEP 2020:**

The domain of teacher education institutes is plagued by a variety of issues. A comprehensive evolution will occur in every domain associated with the use of ICT in educational establishments, including policy and politics, infrastructure advancement, human capacity building, culture, equity, financial considerations, curriculum, and pedagogy, to fulfil the demands of these difficulties in state teacher

preparation. Following are some of the major obstacles to ICT adoption in educational institutions under NEP 2020: (Usou, Joseph, 2022)

1. Lack of proper ICT lab facilities in the college;
2. inadequate hardware and software facilities;
3. a shortage of resources and properly trained teacher educators for ICT education;
4. a lack of fundamental ICT knowledge among teacher-trainees;
5. a lack of proper building infrastructure for ICT-related facilities
6. Overcrowding in the classroom and a lack of computers for all teacher trainees in the institutions
7. Lack of suitable training for the teacher-educators in regard to the use of ICTs equipment.
8. Lack of enough financial assistance from the administration, department, and the government as a whole. It has to upgrade its ICT-related teacher education courses. There aren't enough experts and professionals to create a proper curriculum in accordance with NEP 2020.

**Suggestions for effective implementation of ICT:**

The task of preparing the society and governments for globalization and the information and communication revolution is proving to be extremely difficult for emerging nations in the modern era. To make society competitive in the emerging information economy, policymakers, educators, scholars, and concerned citizens are actively collaborating. ICTs are widely used in education, and it is generally accepted that ICTs can empower instructors and students, significantly enhancing learning and accomplishment. The primary goal of integrating ICT into education is to show the potential integration of ICT into general educational activities.

The following are some ideas about how to use ICT in teacher education successfully:

A. The use of ICTs by teacher candidates should be improved, and teacher educators should be wellequipped with all digital tools.
B. Provide adequate resources and financing for the establishment of computer hardware and software in teacher education institutes.
C. To stay current with technology, teacher educators should be provided with professional training in ICT usage.
D. In order to adequately support teacher-trainees in adopting ICT tools and materials for better teaching and learning processes, ratios of headteacher-educators, and teacher-trainees should be maintained.
E. ICT course content needs to be reorganized in accordance with NEP 2020 and should be actionoriented.
F. To improve ICT implementation, teacher education institutions should take the initiative, be proactive, and care about the community.
G. In order to participate in the worldwide shift in learning and teaching modification, in their instructional practices, teacher educators and teacher candidates should be aware of the societal shift. 8. In order to make effective use of technology, teacher training institutions should provide adequate ICT equipment in every classroom, including computers, LCT projectors, internet connection, television, and e-white boards.
H. To serve as a role models for the teacher-trainees, teacher educators must actively include ICT tools in their regular lesson plans.

I. For the timely organization of ICT training courses, the administrative, Higher Education department, and all relevant authorities should cooperate cooperatively together.
J. Adequate internet connectivity in the classrooms to improve lesson plans;
K. At least one lab with fully operational ICT facilities must be present in teacher education institutions.

**Conclusion:**

The teacher is an important part of the process, but ICT-based education uses a variety of ICT technologies instead are augmented to strengthen the teaching-learning process. There was an increase in curiosity generated among educators and students for access to ICTs and the opportunities they provide. ICT has the power to break down the barriers that are contributing to the nation's low education rate. ICT can be used as a tool to get around problems like lack of teachers, poor quality of instruction, and barriers related to time and location. In these ways, teacher education is vital to changing and enhancing educational procedures and results education for everyone. The NEP 2020 acknowledges the value of technology while also pointing out the risks and hazards it may present. According to NEP 2020, pilot studies should be properly planned and scaled adequately.

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