ICT in Teacher Education with Reference to OER and NEP, 2020

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ABSTRACT: NEP, 2020 : NEP, 2020 has advanced for the implementation of 1 year & 2 year B. Ed along with the 4 year Integrated Teacher Education Programme(ITEP). But after 2030 only the 4 year ITEP will prevail as the single professional degree for any school level Teaching profession. In order to accelerate the universal use of ICT in the field of Teacher education, along with the use of open educational resources, focus should be given on SWAYAM & DIKSHA platforms to provide online learning platform to the teacher Trainees & the short term training programmes for the in-service teachers. As a result, the importance of OER through the above stated two online platforms will be maximized with wider circulation.

KEYWORDS: ICT, Teacher Education, OER & NEP-2020.

> **"Mordern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Boththe constraints of time and distance at once become manageable". - (NPE-RPF, 1992).**

INTRODUCTION

There is a shift from Indian pen to the computer key board, from black boardpresentation to power point presentation, from paper pencil test to computer based test, from interpersonal instruction to mediated instruction, from teacher dependent learning to independent learning. At the same sequence, there is a shift from linear to hypermedia learning, from instruction to construction and connection, from teacher centred to learner centred education, from memorising material to learning how to explore and learn, from school to lifelong learning, from all fit in one to customized learning, from learning as a torture to learning as fun and from the teacher as transmitter to teacher as facilitator.

Use of Technology in Teacher Education or Teacher Training is essentialfrom the following stand points which leads to successful training-

- -For effective administrative changes,
- -to ensure the provision of psychic rewards to teachers receiving training,
- -direct involvement of Institutional authorities,
- -training in basic applications, not programming languages,
- -to act as an informal support and training network for the trainees,
- -for easy access to technologies both at school and at home,
- -to ensure flexibility in administrative rules and procedures, and
- -to enable the teacher to act as a trainer as well as a technologist,

The use of Technology in Education in general and in Teacher Education in particularis running with the below mentioned phase wise development as a sequence;

- Phase 1: Print (Correspondence)
- Phase 2: Print and Audio (radio, audio conference, cassette)
- Phase 3: Print, Audio and Video (television, satellite, videoconference)Phase 4: Print, audio, video and computer (Computer-Assisted

Instruction, electronic mail)Phase 5: Blend of Technologies

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Information and Communication Technology (ICT): The Concept

Information and Communication Technology (ICT) is defined, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." [4] These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephones.

The use of ICT in Education and in Teacher Education is being accelerated with popularity in India and in Globe through its means or sources of communication like Bulletin Board Service (BBS), Communication and information services for education, communication technologies, computer-based communication, computer conferencing, computer-mediated communication, electronic mail(e-mail), Internet, Modem, Network, On- line data bases.

The National Curriculum Frame work (NCF)-2005 focusing on the reformation of teacher education through the active involvement of learners in the process of knowledge construction, shared context of learning, teacher as a facilitator of knowledge construction, multidisciplinary nature of knowledge of teacher education, integration theory and practice dimensions, and engagement with issues and concerns of Contemporary Indian Society froma critical perspective through using multimedia and ICT as sources for two-way interaction rather than one-way reception.

The National Curriculum Frame work for Teacher Education(NCFTE, 2009): This curriculum framework for teacher education has been developed with the purpose of transforming the very dynamics of teacher education and to prepare professional and humane teacher which is need of the global society. This document has been developed basing on the two important document- NCF-2005 and RTE Act-2009 which have global reflections in the school educational system as well as teacher education system. It has envisioned on ICT in scholars as well as e-learners in order to accelerate and strengthened the reflective practice, self-guided learning, engagement of student teachers with the students.

ICT in Teacher Education: Stressing on the integration of technology into teacher education, UNESCO advanced "A Framework for ICTs in Teacher Educaton: A Holistic Framework in 2002. It focuses on taking into account the factors like cultural, educational, technology resources that are important in planning the integration of technology into the teacher education curriculum. The curriculum framework puts emphasis on four themes- **context and culture** which includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modelled by teachers; **Leadership and Vision** are essential for the successful planning and implementation of technology into teacher education and required both leadership and support from the administration of the teacher education institution; **lifelong learning** which reads that learning doesnot stop after schooling or formal education; and **Planning and Management of Change** as todays context and accelerated technology itself which signifiesthe importance of careful planning and effective management of the change process as a strategic combination of approaches that help teacher educators to develop these four competencies.

From practical stand point, the use of ICT in Teacher Education gives trace onenriching the traditional course environment in the Teacher Education Institutions or Programmes with emphasis on the following

- Libraries of exercise files available at all times on the network
- All software is available at any of the computers located at different places in theInstitution
- The system menu provides a common and familiar user interface to the manydifferent services and packages accessible through it
- Collaborative working can be facilitated, through students being able to individuallycontribute to a common task
- Joint and co-operative production of reports and projects
- Opportunity to leave and receive messages as reported by Stanley, 1991

Through ICT in Teacher Education it has become possible to take initiative to link students, teacher educators, supervising teachers in regular communication during the practice teaching component of teacher education programme now comprehensively namedas School Internship. Such electronic linkage eliminates the frequently long stretches of time between visits of the faculty instructor to the school setting because of difficulties in time and organization. Besides Wide-ranging e-mail discussions are held concerning classroom experiences and their relation to theory; this occurs on a daily basis while student

teachers are in the practical situation, through the loan of laptop computers and modems student teachers shared their lesson plans and experiences with each other on a daily basisand got quick feedback and comment from both their teacher-mentor and faculty supervisor, who could enter their observations at times convenient to themselves but within a short time after the practice lesson. In order to facilitate the student teachers for getting rapid feedback on their school internship the on-line discussion among themselves and their supervisors, and the chance to keep in touch with each other when "in the field" as found out by Levin, Waugh, Brown, & Clift, 1994.

There is the necessity of making partnership with theleading institutions and industries in order to facilitate the teacher trainees to obtain varied learning experiences for which there is the necessity of making the arrangement of online collaborative projects.

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As a result, the student teachers not only got to experience the management of an on-line activity while still on their own campus, but also had to develop strategies for tasks such as evaluating children's writing, and tailoring their language to be appropriate for discussion with a child. The on-line setting, let this be done under thesupervision and comment of the faculty instructor, something much harder to replicate in the full-scale practice-teaching situation as observed by Zinck, 1989.

There should be focus on pedagogic principles under the purview of ICT in Teacher Education. The Pedagogic Principles having scientific bases are inbuilt in the use of ICT in teacher education. There are various pedagogic principles of teaching to which every teacher should follow while teaching. For this the teacher should move from;

1. Concrete to abstract,
2. Simple to complex,
3. Easy to difficult,
4. Whole to parts,
5. Induction to deduction,
6. Progressive differentitation to intergrative reconciliation,
7. Impersonal to personal,
8. Differentiated to differential,
9. Building blocks to structure,
10. Learning Styles to Teaching Styles.

These Pedagogic Principles focuses on the principles of Techno-pedagogy for their simplification and level specific application through ICT integrated leaching learning process. These are:-

- Medium is Message
- Media Language Proficiency
- Balanced View Composition
- Projection Time Determination
- Correspondence amongst Sender, Message, Medium and Receiver
- Quality, Demand and Supply of the Digital Products
- Natural Production
- Innovative and Interesting
- Differentiated and Differential
- Wholistic Techno-pedagogy
- Communicative Techno-pedagogy
- Healthy Techno-pedagogy
- Symbiotic and Cybernetic
- Teleprompting and Presentation
- Aspect Ratio of the Presenter, Graphics, Video and Animation
- Constructivist and Connectionist TPCK
- F2F Type Techno-pedagogy
- Culture Compatible Techno-pedagogy

Govt. of India+Initiatives: The following initiatives have been taken by the govt of india for accelerating and enhancing ICT in Teacher Education. These are;

a. An award scheme for excellence in computer literacy and information technology in schools in the year 2002 at state and national level to create IT awareness among schools and to encourage computer literacy among students in early stage of schooling.

b. **ICT @ Schools,** launched by the Govt. of India in 2004 after merging the erstwhile schemes of Educational Technology(ET) and Computer Literacy and Studies in Schools (CLASS).

c. **Sakshat: One Stop Solution to Education-Online**, a Portal of MHRD launched in October, 2006 containing four approaches to learning includes written course material, animations, simulations, video lectures, related web links, question answers, confidence building measures and other details apart from a mechanism for maintaining the progress profile of learners on SAKSHAT. A module of digitalliteracy prepared by the scheme tells everything about computers, how to use them, how to logon to the internet and how to know about SAKSHAT and come to SAKSHAT to get the relevant knowledge modules for illiterate dropouts.

This approach of ICT in School and Teacher Education invites every Indian to freely contribute his or her wisdom with fellow countrymen so as to enable all of us toput all our knowledge and energies together for making India a **Knowledge Super Power**. The recent effort of the Government of India (GOI) seeks to strengthen the use of ICTin almost every sphere of life. The Digital India Campaign (2015) of GOI strives to transformIndia into a Digitally Empowered Society and Knowledge Economy by focusing

on the three vision areas such as;
i.   Digital Infrastructure as core utility to every citizen,
ii. Governance and Services on Demand and
iii. Digital literacy and empowerment of Citizens. The three cardinal principles of presenteducation policy viz., access, equity and quality could be maximised through the hugepotential of ICT. Anytime anywhere mode of delivering quality education using ICTis one such implication of technology in education. To motivate teachers to use ICT extensively, many incentives have been instituted by the Government of India. One such incentive for the school teachers is "National ICT Award for School Teachers".

Besides, the Govt. of India also organised the following activities in collaboration with other agencies or organisations;

-Organised training for all the teachers of participating schools on technology aided learning in collaboration Intel Hardware Company.

-Organised a programme of computer aided learning in rural elimentary schools in collaboration with AJIM PREMJI Foundation, Karnatak.

-Media Lab Asia launched by the Govt. of India in the year 2006-07 is focused on the use of ICT for health care, education and lively hood generation, empowerment of the Disabled and providing rural connectivity

-ICT enable teaching in rural schools conducted in a few selected schools in Karnataka todeploy ICT in Class Room teaching on a pilot basis. In this project, 15 rural school science teacher were trained on the use of software content for science teaching.

Inititaves taken by NCERT: The NCERT has taken the following initiatives for ICT in School and Teacher Education;
   a. Organised 2-week Orientation Programmes for Teacher Educators on;
      -integrating ICT in Curriculum transaction,
      -use of IT tools and IT based learning resources in collaboration with NCTE for the purpose of designing NCFTE,2009
   b. Designed and developed Educational Multimedia software for effective teaching learning process which are disseminated off-line with a few in online also.
   c. Developed instructional materials on e-learning SAKSHAT.

Importance Open Educational Resources(OER)- Open Educational Resources (OER) are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no- cost access, use, adaptation and redistribution by others with no or limited restrictions.

-UNESCO, 2012

OERs are playing a vital role in enhancing quality, strengthening access and meeting the necessities of equity particular through Distance Education in the form of ICT in Education The Indian Government has played a proactive role by providing impetus to the growth of OER movement in the country through various national policy initiatives. A large number of national policymaking bodies such as National Knowledge Commission (NKC), University Grants Commission (UGC) and other advisory bodies are providing the support to the movement in the country for improving access to Quality Education.

The term OER was first used at the UNESCO forum on the potential of open courseware for higher education in developing countries in the year 2002. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge" (Atkins, Brown & Hammond, 2007).

According to OECD (2007), OER is said to include:
- **Learning Content:** Full courses, courseware, content modules, learning objects, collections and journals.
- **Tools:** Software to support the development, use, re-use and delivery of learning content including searching and organization of content, content and learning management systems, content development tools, and online learning communities.
- **Implementation Resources:** Intellectual property licenses to promote open publishing of materials, design principles of best practice, and localization of content.

The basic idea underlying the concept of OER —is the freedom to share knowledge and that knowledge should be legally, socially, and technologically open. It is built on the belief that everyone should have the freedom to use,customize, improve and redistribute educational resources without constraint.

The importance of OERs have been felt as these resources are seen as fundamental to knowledge society and economy. The use of OERs help to improve education across the globe. Beethan(2013) expressed the the importance of the OERs in the following heads.
- Building reputation of individuals or institutions or communities
- Improving efficiency, cost and quality of production
- Opening access to knowledge
- Enhancing pedagogy and the students' learning experience
- Building technological momentum

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These resources are important for developing countries like India where many students may not be able to afford textbooks, where access to classrooms may be limited, andteacher training programmes may be lacking, OERs offer access to some of the, worlds best courses with huge cost saving as alternatives two expensive text books. These resources provide free and legal access to some of the worlds best courses which become helpful for theteachers in adapting their local languages and cultures by using them as the basis for innovation.

Uses of OERs: The use of OERs facilitate the trainees and teacher educators for meeting the changing teaching-learning practices. The easy and free availability of quality teaching- learning resources become possible through the use of OERs. The uses of OERs with significance has been felt in case of developing countries like India as observed by Kanwar, 2010. These are;

a. OERs facilitate every student to access course materials with free of cost.
b. OERs allow faculty to create materials that are essential and qualitative for their students.
c. OERs provide scope for enhancement of the learning materials through world wideaccess and comments.
d. OERs help the developing Countries like India to save the time and money spent forcourse material development.
e. These resources facilitate sharing of knowledge and experiences among the studentsand teachers.
f. OERs provide scope to add new sections and chapters on the basis of variedexperiences obtained in worldwide basis.
g. These resources provide platform to use as capacity building resources for teachereducators.
h. Use of OERs help the students and teachers in preserving and disseminatingindigenous knowledge.
i. These resources make the teacher educators to be resourceful in their class roomteaching.
j. Use of OERs improve the quality of teaching and education at all the levels of schooleducation including teacher education.

Overall speaking on the uses of OERs it has been realised to highlight that these resources provide learning materials in nominal caste to the students, facilitate faculty including teacher educators to refine and reorganise their experiences on the basis of worldwide comment and feedback which enhances their own work and add quality at all the levels of education with making a specification of contents for different classes which become very useful for the faculty or teacher educators.

The open education movement is driven by a shared belief that education should be free and there should be no legal constraints on collective use of knowledge. Use of OERs in educational institutions leads to improved access, enhanced pedagogy, and increased sharing between educators. OERs are characterised by openness which renders it free to reuse, revise,remix and redistribute, also referred to as 4Rs (Wiley, 2009). Open licensing, a distinguishingfeature of OERs, sets it apart from other resources and enables the user to use and reuse content according to individual needs. Hylen (2006) argues that OERs enable wider dissemination of knowledge, collaborative problem solving, quality improvement, increased development, and diminishing of societal inequalities.

India embraced OER by the year 2007, with support from government and external funding agencies (James & Bossu, 2014).

Some of the open access initiatives have contributed largely to the creation, utilizationand expansion of OER in India. These are as follows:

a. ***Digital Library of India*** is a collaborative project of over 21 institutions in India andis currently hosted by IISc (Indian Institute of Science),Bangalore
b. ***National Digital Library (NDL)*** is an initiative of IIT Kharagpur and aims to provide free access to digitized educational content in English and other Indian languages on acommon platform.
c. ***National Knowledge Network (NKN)*** is an initiative established in 2010, on the recommendations of the NKC (2007), it marks a step towards creation of a knowledgesociety.
d. ***Shodhganga*** is a digital repository of Indian theses and dissertations, set up by INFLIBNET (Information and Library Network) Centre in 2010.
e. ***ShodhGangotri*** is a repository of Indian Research in Progress. This is an initiative by the INFLIBNET Centre which was started in 2011.

Premier educational institutions in the country have taken up collaborative initiatives for providing their educational resources through web portals. Some of the major initiatives operating at a national level in educational institutions are as follows:

i. *National Programme on Technology Enhanced Learning (NPTEL)* This is a joint initiative of the seven Indian Institutes of Technology (IITs) (IIT, Bombay; IIT, Delhi;IIT, Guwahati; IIT, Kanpur; IIT, Kharagpur; IIT,Madras; and IIT, Roorkee) and the Indian Institute of Science (IISc). The quality of engineering education in engineering and sciences. Online web and video courses are provided for free,
ii. *Consortium for Educational Communication (CEC)*the Indian Institute of Technology, Bombay, eGuru (providing online mentorship to engineering students), eOutreach (repository of high quality educational material),and eContent (proving quality content in Indian languages).
iii. eGyanKosh is a knowledge repository to store, index, preserve, distribute, and share the digital learning resources developed by the ODL institutions in the country. This repository offers online access to around 3000 courses of IGNOU and 2,000 video

lectures.

iv. *e-PG Pathshala Project National Council of Educational Research and Training(NCERT)*for Vocational programmes at the level of Secondary and Sr. Secondary (+2)levels. The project is carried out in partnership with state level institutions and organizations.

v. *SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds):* Swayam platform is an initiative by MHRD, to provide free Massive Open On-line Courses (MOOCs) on all kinds of subjects.

vi. *SWAYAM Prabha* is designed to provide 32 high quality educational channels throughDTH(Direct to Home) across the length and Breadth of the country on 24x7 basis.

vii. *E-Shodh Sindhu* ams at providing access to quality electronic resources including full text, bibliographic and factual data bases to academic institution at a lower rates of subscription.

viii. FOSSEE designed by the MHRD very recently. This Free and Open Source Software in Education (FOSSEE) project ams at promoting the use of open software in educational institution to improve the quality of education by reducingthe dependency on proprietary software.

ix. *Virtual lab* aims at providing remote access to laboratory in various disciplines ofscience and engineering for student at all level from under graduate level to

Research level. This is an initiative taken by MHRD under the National missionon education through Information and Communication Technology with the purpose to develop a Complete Learning Management System where students canavail various tools for learning including additional web-resources, video- lectures, animated demonstrations and self-evaluation. The project aims to launch2,000 massive open online courses (MOOC) for over 30 million students this yearcountries as cited by Kanwar,

Concluding remarks: Inspite of the importance of ICT in Higher Education ingeneral and teacher education in particular with a catalyst role played by OERs for universalising the educational facilities for all categories of learners and people. The justification is, importance of OERs have been felt for people of all ages and backgrounds to actualise free information as a fundamental human right. It is through these resources people of all ages and background to learn more about the world around them and access the tools they need to improve their lives and livelihoods. There are some issues stand as barriers tothe progress of OERs in the education process as reported by a study of OECD(2007) are;

 a) Technical barriers such as lack of Broadband access,
 b) Economic barriers such as inadequate resources to invest in the required hardwareand software
 c) Social barriers such as lack of the skills needed to use technology.
 d) Policy-oriented barriers such as the lack of clear policy in Institutions regardingOER.
 e) Legal barriers such as the time and expense associated with gaining permission to use.

However, there is the essentiality of ICT with focus on the OERs for a developing country like India in order to make the teacher trainees to be competent, efficient andresourceful future teachers through integration of ICT into Teacher Education. As a result, they can have a great deal of objective and scientific analysis of the subjects supported by a good number of evidences. Besides, the use of OERs also enable the teachers to be dynamic, systematic and scientific with a good informational and transformational educational leaders in their future days.

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