

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN SCHOOL EDUCATION

Mohan Kishor Mahanta

Ph.D. Scholar, Department of Education

Regional Institute of Education, NCERT, Under Utkal University Bhubaneswar

Paper Received On: 25 Oct 2021

Peer Reviewed On: 20 Nov 2021

Published On: 01 Dec 2021

Abstract

Information and Communication Technology (ICT) has become one of the basic building blocks of modern society. Many countries now regard understanding of ICT and mastering the basic ICT skills (Communication, Collaboration, Creativity, Critical Thinking and Problem Solving) as part of the core of education, along with reading, writing and arithmetic. Till date, 88993 (60.8%) secondary and senior secondary schools of both government and government aided have been covered under ICT@ Schools scheme out of total 146303 schools. Besides, Computer Aided Learning (CAL) programme under SSA provided ICT infrastructure in Upper Primary schools, through provision of Rs.50 Lakh per annum per district. The CAL scheme had a coverage of 92,886 out of 4,20,221 schools (22%) approximately. Under the Teacher Education plan, ICT infrastructure are also being provided to the TEIs i.e. SCERTs/SIEs, DIETs, BITEs, etc. Now the Digital India Campaign (2015) strives to transform India into a digitally empowered society and knowledge economy by focusing on the three vision areas: Digital Infrastructure as Core Utility to Every Citizen, e-Governance and Services on Demand & Digital literacy and empowerment of citizen. All Examination Boards in the country would be encouraged to offer ICT related subjects in an integrated way up to class X and as electives at the Senior Secondary stage. This scheme would encourage individual schools to offer such electives, so that a large number of human resources with ICT skills/competencies can be built up in the country. Similarly all the SCERTs/SIEs/DIETs/BITEs would design and integrate ICT in Education and Learning components in the Pre-Service and In-Service professional development courses. Advanced Use different software applications to enhance one's own learning – database applications, analysis of data and problem solving, computing, design, graphical and audio-visual communication; undertake research and carry out projects using web resources; use ICT for documentation and presentation; create and participate in web based networks for cooperative and collaborative learning; become aware of issues of cyber security, copyright and safe use of ICT and take necessary steps to protect oneself and ICT resources

Introduction:

Information and Communication Technology (ICT) has become one of the basic building blocks of modern society. Many countries now regard understanding of ICT and mastering the basic ICT skills (Communication, Collaboration, Creativity, Critical Thinking and Problem Solving) as part of the core of education, along with reading, writing and arithmetic.

The Government of India seeks to strengthen the use of ICT in almost every sphere. To promote the use of ICT in school education the Government of India had introduced ICT@ Schools scheme in the year 2004 {by merging the scheme of Educational Technology -1972 and Computer Literacy and Studies in Secondary Schools (CLASS)-1984}. The scheme was revised in the year 2010 and 2011 and a component to develop quality digital contents and incentives for teachers (National ICT Award for School Teachers) was introduced. Till date, 88993 (60.8%) secondary and senior secondary schools of both government and government aided have been covered under ICT@ Schools scheme out of total 146303 schools. Besides, Computer Aided Learning (CAL) programme under SSA provided ICT infrastructure in Upper Primary schools, through provision of Rs.50 Lakh per annum per district. The CAL scheme had a coverage of 92,886 out of 4,20,221 schools (22%) approximately. Under the Teacher Education plan, ICT infrastructure are also being provided to the TEIs i.e. SCERTs/SIEs, DIETs, BITEs, etc.

Now the Digital India Campaign (2015) strives to transform India into a digitally empowered society and knowledge economy by focusing on the three vision areas:

- I. Digital Infrastructure as Core Utility to Every Citizen,
- II. e-Governance and Services on Demand
- III. Digital literacy and empowerment of citizen.

The three cardinal principles of access, equity and quality could be served well by harnessing the immense potential of ICT. Anytime anywhere delivery of quality education employing ICT is one such implication of Technology in Education. Development in India depends on the extent to which we are able to provide quality education and skill training to all our citizens. Relevant use of technology will help to effectively solve India's problem of providing quality education and development of skilled human resources. ICT needs to be used to provide high quality education, as well as, holistic education to each child including children and youth with special needs and marginalized sections of the society.

ICT in any system and situation includes ICT infrastructure, creation, storage and retrieval of digital resources, use of inter-operable software, technical support, networking using telecommunication and satellite-based communication to enhance learning. The schools and TEIs require a robust, reliable ICT infrastructure in order to effectively integrate ICT into all aspects of school life and that of TEIs including teaching, learning and evaluation.

OBJECTIVES:

- Universal equitable, open and free access to a state of art ICT and IT enabled learning environment, tools and digital resources to all students, teachers and teacher educators (BITEs, DIETs, SCERTs, etc.)
- Development of local, localized and vernacular quality digital contents in regional languages and to enable students, teachers and teacher educators to partner in the development and critical use of shared digital resources.
- Enable sharing of ICT infrastructure for skill development of youth and digital literacy of the community.
- ICT enabled assessment & evaluation of the learning outcomes of students in a cumulative manner, tracking of the performance of the teachers, teacher educators, managers etc.
- Development of professional networks of teachers, teacher educators, resource persons in schools and TEIs to catalyse and support resource sharing, up-gradation and continuing education of teachers and educators; guidance, counselling, academic support of students, resource sharing, management and networking of school managers/administrators etc., resulting in improved efficiencies in the schooling process and TEIs.
- Promote research, evaluation and experimentation using ICT tools and ICT enabled practices in order to inform, guide and utilise the potentials of ICT in school and teacher education.
- Appropriate ICT interventions will be adopted to bridge the digital divide with regard to education of girls, and other disadvantaged social groups, including SCs/STs, minorities, CWSN, and other marginalized communities.
- A critical understanding of ICT is core to its success, hence, its benefits, risks and limitations- safe, secure and ethical use of ICT needs to be infused in schools and teacher education curriculum.
- Sensitization of all the stakeholders on the disposal of e-waste and contribute in sustainable development.

ICT implementation has essentially four components:

The **first** one is the partnership with State Governments and Union Territories Administrations for providing ICT enabled education to Government and Government aided schools and TEIs (SCERTs/ SIEs, DIETs and BITEs).

The **second** component is teacher related interventions, such as, provision for engagement of an ICT teacher in schools, continuous capacity enhancement of all teachers in the use of ICT, and recognition of teachers and teacher educators for innovative use of ICT in education and learning, as a means of motivation. Every teacher is expected to innovatively use ICTs in teaching learning process by selecting and integrating a wide variety of ICT tools and Free and open-source software (FOSS) (including subject specific tools i.e. GeoGebra for Math; Stellarium, PhET simulations, Kalzium etc. for Science; Open street map and Marble for Geography; concept mapping tools like Free Mind etc.)

Third one relates to the development of digital contents, curation and deployment of existing digital contents mainly through Central Institute of Educational Technology (CIET), National Institute of Education (NIE), NCERT, State Institutes of Educational Technology (SIETs), SCERTs/SIEs and RIEs, and through outsourcing from different relevant agencies. A variety of digital learning resources including audios, videos, interactive, multi-media digital charts, maps, timelines, digital books, on-line labs activities, **virtual and augmented learning resources** need to be developed and will be used to enhance teaching learning process in schools and TEIs and learning outcomes among students, teachers, pupil-teachers and teacher educators. These resources need to be disseminated through multiple modes (transmission and non-transmission)- web-portal, mobile apps, **DTH TV** channels etc. Further offline solutions need to be designed and used for delivery of digital contents through Local Area Networking (**LAN**)/ Satellite connectivity. To augment the teaching learning process, continuous professional development of teachers, skill training and promote lifelong learning among all stakeholders in schools and TEIs. **DTH TV** channels should be used through designing of **virtual learning materials** including lectures by best available teachers from the State.

Fourth component is related to creation of Management Information System (MIS) of the schools and TEIs ecosystem to enable cumulative assessments, evaluation, monitoring, regular feedbacks and enhanced learning at various levels.

Expansion of coverage of schools and TEIs in partnership with States/UT:

It shall be the endeavour to bring all Government schools from classes VI to XII, TEIs under the ambit of the scheme in a phased manner.

Infrastructure:

Hardware and software: The scheme suggests that each school, TEIs as per their requirement may choose to opt for the following: Tablets/Laptops/Notebooks/PCs with Integrated Teaching Learning Devices, Digital Boards with Content Management Systems and solutions (CMS)/Learning Management Systems (LMS), FOSS, Operating System (OS) and/or Servers with minimum 16 GB RAM, 1 TB Hard Disk, 1 Projector/LCD/LED/Plasma Screen, 1 Printer, 1 Scanner, 1 Web Camera, 1 Modem, Broadband/DTH-TV Antenna/Router, Receive only Terminal (RoT), Satellite Interactive Terminal (SIT), Generator/ Solar Package, UPS, Video Camera, Charging Racks, etc.

Connectivity: It is suggested that the school, TEIs should have a broadband internet connection of at least 2 MBPS bandwidth with a plan to upgrade in future. The school and TEIs should also explore the Wireless links option to ensure sustainability. Efforts should be made to bring all the schools and TEIs under the ambit of National Knowledge Network (NKN) or any other partners. This may be done in convergence with BHARATNET.

Power Supply: Wherever the power supply is unreliable it is suggested to procure solar power panels and wherever they are not feasible a generator may be used on a temporary basis. In such cases where the school and TEI is using a generator facility; a recurring cost subject to a maximum of Rs.3000 per month will be applicable. For reliable power supply, it is advised to take into consideration the guidelines of Ministry of Power & Ministry of Renewable Energy, Government of India for convergence of plans and services.

ICT Infrastructure: The Tablets/ Laptops/ Notebooks would be installed in charging rack(s)(portable) which can be kept in any of the classrooms/Principal/Head Teacher room/ office room as per the availability in the school and TEIs. If any school has existing ICT labs, the same may be used for keeping charging racks.

Mode of Implementation:

It is suggested to the States, UTs and Autonomous bodies, that in-order to implement the program they may opt for any of the following models (uni/ multi model) as per their requirement which includes: Outright purchase through Government e-Market (GeM)/BOOT/BOO Model. For all the above-mentioned models, the Service Providers/Original Equipment Manufacturer (OEM) would make available the ICT

infrastructure and learning services based on a signed agreement with the State, UTs and Autonomous bodies. The payments upfront and periodic to the service providers and OEMs will be subject to satisfactory deployment, maintenance and implementation of ICT Infrastructure & Services. The States/UTs Govt. and Autonomous bodies shall be free to partner with private organizations or integrate it with other similar schemes for implementation of the 'ICT in schools' scheme including a provision for annual maintenance. The Ministry of Human Resource Development shall consider the entry of the private sector in any of the above-mentioned models. The NCTE and NCERT shall be associated with the scheme in the context of teacher professional development through technology-enabled learning.

Inclusive Education:

Assistive technologies such as JAWS and SAFTA, Audio Books etc. and other assistive technology-based solutions will be provided to students with special needs from classes VI to XII and to TEIs. The Rehabilitation Council of India (RCI) would play an important role in this area involving introduction and use of technology for the education of Divyang/ Children with Special Needs and addressing the concerns related to Universal Design of Learning (UDL).

Financial Parameters: The assistance of the Government of India would be for the following items and up to the limits indicated against each item:

Note: The cost includes Annual Maintenance Contract for a minimum period of 5 years

a.	Capital Expenditure (Non-recurring)	(Rs. in lakhs)
1.	Tablets/ Laptops/Notebooks/PCs with Integrated Teaching Learning Devices, Digital Boards with Content Management Systems/solutions (CMS)/ Learning Management Systems (LMS), Free and Open Source Software (FOSS) and OS and/or Servers with minimum 16 GB RAM, 1 TB Hard Disk, 1 Projector/ LCD/ LED/ Plasma Screen, 1 Printer, 1 Scanner, 1 Web Camera, 1 Modem, Broadband/DTH-TV Antenna/ ROT/ SIT, Router, Generator/ Solar Package/Panel, UPS, Video Camera, Charging Racks, etc.	6.00
2.	Operating System & Application Software, Open Source Video Conferencing Software (FOSS may be preferred)	0.20
3.	Furniture	0.20
	Total	6.40

b.	Recurring Expenditure	(Rs. in lakhs)
1.	E Content and Digital Resources	0.24
2.	Charges for Electricity/Diesel/Kerosene @ Rs.2000/- p.m. The state may also use Solar Power-Hybrid solar instead, to ensure Sustainability in which case this amount may be utilised for providing additional e-resources.	0.24
3.	Internet connectivity (Tele communications/ satellite communication/ OFC) @ 1000 PM	0.12
4.	Financial Assistance for ICT Instructor @ upto Rs.15000/- p.m.	1.80
	Total	2.40

Note: *4.1 In order to enhance the learning capacities of the students, the schools, TEIs in states/ UTs and Autonomous bodies should optimise/maximise the numbers of Tablets/Laptops/PCs/Notebooks in the classroom situation. Content Access Management devices (Offline, Online, Satellite Based) should be used for effective classroom transaction.

4.2 The cost includes Annual Maintenance Contract (AMC) for a minimum period of 5 years. The state and UTs needs to commit to take ownership of the project after completion of five years.

The state and UTs are provided flexibility in procuring suitable hardware and software under the budget ceiling. However, all efforts should be made to procure and use Free and Open Source Software (FOSS).

The ICT teacher in schools and TEIs shall provide assistance in implementation of the scheme through hardware, software and ICT pedagogy integration in classroom transaction. Prioritization of schools for ICT implementation will be given to schools providing greater coverage across grades and number of students.

Interventions for Teacher:

Under the scheme, all Government schools and TEIs (SCERTs, DIETs and BITEs) will have a minimum level of ICT infrastructure. It should be the endeavour to make all students, teachers and teacher educators of these schools and TEIs, ICT literate. This would involve formulation and transaction of curriculum and syllabus on ICT for each of the classes from VI to XII and for TEIs at pre-service and in-service level.

All Examination Boards in the country would be encouraged to offer ICT related subjects in an integrated way up to class X and as electives at the Senior Secondary stage. This scheme would encourage individual schools to offer such electives, so that a large number of human resources with ICT skills/competencies can be built up in the country.

Similarly all the SCERTs/SIEs/DIETs/BITEs would design and integrate ICT in Education and Learning components in the Pre-Service and In-Service professional development courses.

Teachers' Training:

Pre-Service Training: It will be necessary for all the TEIs to integrate ICT in teaching-learning in the pre-service training courses meant for student teachers. The ICT curriculum prescribed by National Council for Teacher Education needs to be implemented (NCTE Curriculum Guidelines are at Annexure-VII).

In-Service Training: The teachers' curriculum is considered a significant vehicle for the realisation of the goals of the National Curriculum Framework and consequently is designed to provide an enhanced exposure to information and resources for ongoing professional support, improved teaching-learning-evaluation-tracking, and increased productivity. The National Policy on ICT in School Education organises the competencies for ICT Literacy into three broad levels, basic, intermediate and advanced, and the curriculum subsumes them.

ICT IN EDUCATION CURRICULUM FOR TEACHER:

Stage 1: Basic Basics of computers and basic use of tools and techniques – operate a computer, store, retrieve and manage data, use a computer to achieve basic word and data processing tasks; connect, disconnect and troubleshoot basic storage, input and output devices. Connect to the internet, use email and web surfing, use search engines; keep the computer updated and secure; operate and manage content from external devices (sound recorders, digital cameras, scanners etc.); connect, disconnect, operate and troubleshoot digital devices.

Stage 2: Intermediate Create and manage content using a variety of software applications and digital devices; using web sites and search engines to locate, retrieve and manage content, tools and resources; install, uninstall and troubleshoot simple software applications.

Stage 3: Advanced Use different software applications to enhance one's own learning – database applications, analysis of data and problem solving, computing, design, graphical and audio-visual communication; undertake research and carry out projects using web resources; use ICT for documentation and presentation; create and participate in web based networks for

cooperative and collaborative learning; become aware of issues of cyber security, copyright and safe use of ICT and take necessary steps to protect oneself and ICT resources.

The content of the curriculum involves activities which simultaneously draw upon competencies from different levels, such that completion of all levels is ensured. The ICT in Education curriculum broadly attempts to equip teachers with ICT competencies to strengthen their own professional capacities and to effectively use ICT tools and devices in their teaching-learning. The teacher will also be trained to manage the ICT environment in the school and function as a local coordinator for organizing capacity building programmes.

The curriculum therefore is rolled out as a series of short courses, spanning the six strands and ensuring together the basic, intermediate and advanced levels of competence. Three induction and twenty refresher courses leading to a diploma in ICT in Education is proposed. Induction courses are to be conducted in face-to-face mode whereas State (SCERTs/ SIEs) may choose to conduct the refreshers in face to face or in online mode.

Induction 01* (For beginners) – 10 days (4 credits).

Refresher 01 -10 (For all teachers) – Each refresher 40 hours: 24 hrs of transaction and 16 of project & presentation (20 credits).

Induction 02 (For all teachers) – 5 days (4 credits)

Induction 01 - Basics (10 days):

Ses. No	Session Title	Description
1	Registration and Entry level assessment	Registering in course port, introducing to the co-learners and filling the entry level competency questionnaire
2	Creating with ICT – Media : Images	Creating/ capturing images as piece of communication in multiple ways using mobile
3	Creating with ICT – Media : Audio and video	Creating audio and video as piece of communication in multiple ways using mobile
4	Creating with ICT – Text	Creating text as a piece of communication by inputting and formatting text.
5	Inputting in regional language	Creating text as a piece of communication in regional language by inputting and formatting text
6	Creating with ICT – Data	Understanding forms of data, different formats in which data can be captured - images, numbers,

		text, audio, video etc and various ways of representing data. Reading data and making meaning out of it
7	Bringing together hardware and software	Acquainting with the functionalities of a system and general features of operating system. Connecting and configuring the hardware for specified purpose.
8	Introduction to browser and browsing	Accessing relevant information from the web using URL
9	Accessing information through web	Accessing textual information using search engines
10	Exploring Web resources I	Accessing images in several ways and using various techniques
11	Communicating through Email	Communicating through email using the web in a safe and responsible manner
12	Exploring Web resources II	Accessing media resources by exploring various repositories
13	Working with data – Exploring spreadsheet 1	Working with spreadsheets to input, organise, classify, order and analyse data – text and numeric
14	Working with data Exploring spreadsheet 2	Working with spreadsheets to extend and represent data using graphs.
15	Creating with ICT - Textual Communication	Creating textual communication and enhancing with tables, various media, special characters, symbols and formulae
16	ICT in the classroom – hardware and software	Practising various possibilities of using hardware and software in classroom environment
17	Introduction to Assistive technologies	Understanding assistive technologies and ICT based assistive devices
18	Collaborating and transacting with Web	Collaborating with others through e-groups. Acquainting with web based courses platforms and transacting through web

19	MIS systems for educational management	Understanding the need, important, structure and functioning of School based MIS
20	Exhibition and Evaluation of e-portfolio submission	Output created for assignments will be evaluated based on the rubric. Best works will be showcased

Basic Refreshers (Each refresher for 40 hours)

Refresher No	Refresher Title	Description
1	ICT for teaching learning –1	Appreciate the potential of ICT in Education, specifically in teaching and learning. Releasing the importance of learner analysis and classroom analysis. Analyzing curriculum to identify areas for ICT infusion (analyzing and abstracting, evaluating and problem solving). Determining the ICT resources for teaching-learning.
2	Digital storytelling	Capturing information in non-textual ways; appropriate media choices for a given communication need. Combining text, graphic and audio visuals to create a communication. Developing a story and scripting by combining multiple digital media. Developing digital stories for communication in classrooms. Evaluating digital stories. Exploring possibilities for inclusive using digital story telling.
3	Internet as a learning resources	Exploring the internet and Identifying appropriate resources for personal enrichment, professional learning, teaching learning ideas and creation of multiple learning spaces. Organizing the identified resources. Evaluating resources for use in specific contexts.

4	ICT for teaching of Languages/Mathematics/ Sciences/ Social Sciences	Understanding the scope of using ICT in teaching of subjects. Exploring range of ICT tools such as subject specific FOSS, internet based resources, mobile apps etc for teaching and learning of specific subject.
5	Simulations for teaching of Languages/ Mathematics/ Sciences/ Social Sciences	Exploring various simulation based tools/ resources for teaching specific subject. Creating e-resources for specific subjects using simulation tools. Building personal libraries of content resources.
6	Interacts for teaching of Languages/ Mathematics/ Sciences/ Social Sciences	Exploring various interactive tools/resources for teaching specific subject. Creating e-resources for specific subjects using interactive tools. Building personal libraries of content resources.
7	Games and Apps for teaching of Languages/ Mathematics/ Sciences/ Social Sciences	Exploring various mobile apps and games for teaching specific subject. Creating e-resources for specific subjects. Building personal libraries of content resources.
8	ICT for teaching learning – 2	Designing and organizing learning environments for classrooms. Mapping skills to be built and the content. Identifying applications, media and materials to enhance teaching learning process. Developing ICT infused instructional plan and build personal libraries of classroom ideas and resources.
9	ICT for teaching learning – 3	Deconstructing ICT for teaching-learning (Using ICT in the classroom, technologies and methods. Organizing learning and designing learning environments (classroom organisation and adaptation for ICT). . Interacting with hardware

		and software. Building personal libraries of classroom resources.
10	ICT for evaluation	Exploring ICT based tools and techniques. Building personal libraries of evaluation resources. Applying ICT tools for evaluation of teaching-learning process.

National Award for the Teachers using ICT in Education:

In order to motivate teachers and teacher educators to use ICT in school and teacher education in a big way, National Awards for the Teachers using ICT would be given to 90 teachers every year. An amount of Rs. 1crore would be kept aside for instituting National Award for the Teachers using ICT for innovations in education. A selection process will be followed by NCERT for short-listing and recommendation of required number of awardees to MHRD-GoI.

Creation of Management Information System of the Schools and TEIs

With the increase in the mandate and outreach of the scheme, an appropriate management structure is needed at the national, state and district levels. The States/UTs and Autonomous bodies are expected to develop an automated mechanism (eMIS), for the assets procured under Integrated ICT Scheme, which shall include: Tracking Inventory for hardware, software (including license compliance, vendors, POs, tenders etc.) to facilitate online redressal of issues related to routine operation and maintenance of the scheme and maintain transparency.

Digital Content Development:

Development of appropriate digital content and its persistent and effective use constitutes the core of this scheme. This task would be shared by CIET, Regional Institutes of Education (RIEs), and Pandit Sundarlal Sharma Central Institute of Vocational Education (PSSCIVE) of the NCERT, State Institutes of Educational Technology (SIETs), ET units of SCERTs/SIEs, Institutes of repute having experience of education and development of digital content and other wings of central and State Governments as required. Outsourcing to private sector in a transparent manner may also be done.

Content creation/ acquisition being the critical factor for the success of the scheme, the CIET- NCERT shall work towards utilising the full range of capabilities of the Indian ICT sector. National level and State level committees should also be set up to assess the nature of digital contents to be developed to enhance the learning capabilities of the students, teachers,

pupil teachers and teacher educators of schools and TEIs. Efforts should be made on development of digital contents and building of portal/repository/OER/Mobile apps for dissemination of best practices.

Digital contents developed by any of the stakeholders in the country are to be linked with the dissemination platforms. The digital content should be platform agnostic/neutral.

The content should cover the hard-spots for all the grades.

The content should be essentially mapped to NCERT, SCERTs/SIEs and other state board curriculum. While development of digital contents, effort should be made to design these in local, localised and regional languages.

It should contain 3D/2D immersive Videos.

The modules are to be created in a way that it supports a Teacher-led delivery which requires continual teacher intervention to keep the focus on students learning.

The modules are to be created in a way that the topics covered are creatively and pedagogically designed.

Development of Infrastructure:

Existing course contents of various teacher training programmes and curriculum based digital contents offered across the country have little component of Educational Multimedia, virtual realities etc. It is proposed to fill this gap by developing and deploying the interactive multimedia, digital books, virtual labs etc. The content developed for various subjects should be translated into other languages and adapted to a regional context so as to avoid de novo efforts for each language. ICT based Science Lab, Math lab and Language Lab should be established with integration of hardware & software.

Financial Parameters:

Financial assistance would be provided to CIET, SIETs, SCERTs/SIEs, RIEs, PSSCIVE and other institutes including outsourcing agencies for development of e-content, based on the project proposals submitted by them. The norms for development of digital contents shall be developed by CIET and disseminated among all the above mentioned institutes for its adherence.

A variety of digital learning resources including audios, videos, interactives, multimedia digital charts, maps, timelines, digital books, on-line labs activities, virtual and augmented learning resources need to be developed and will be used to enhance teaching learning process in schools and TEIs and learning outcomes among students, teachers, pupil teachers and teacher educators. The content developed for various subjects at one

laboratory/institute would be translated into other languages at other laboratories and adapted to a regional context so as to avoid de novo efforts for each language.

Programme Management:

The proposal for using ICT should include the details of the infrastructure put in place in the previous year as well as utilization in imparting more effective classroom teaching. The states should share the POCs (Proof of Concepts) and Best practices and innovations for sharing with other States. Details of the provision made in the State budget, including that for the State share should be a mandatory requirement of ICT Plan. CIET, SIETs, RIEs and other institutes etc shall also have to submit their annual work plans for various components of the scheme for consideration by PAB.

The Recurring Grant will also be provided to the State/UTs for the period of 5 years only from the year of implementation. Once the implementation report/Status is received from the State, first installment of the Recurring Grant will be released immediately on the basis of the implementation report/basis. However, the release of the second installments recurring grant in the second and subsequent years would be based on receipt of utilization certificate along with the progress report and audited statement of accounts in respect of grants released till the end of the preceding year is furnished.

The recurring grant, for the schools that have already been approved and where implementation has been started, will be provided on the basis of the old ICT scheme. The recurring grant, for the schools have been approved but are yet to be implemented by the State, will be provided on the basis of the revised guidelines.

Management, Monitoring and Evaluation:

The respective States would have an internal mechanism for overseeing the implementation of the programme through a monitoring committee constituted for the purpose. The main parameters for monitoring would include timely installation of requisite hardware, including power supply, suitable software, engagement of teaching and administrative staff, teacher training and extent of use of e-content developed at the multimedia labs by the teachers. The State Govt. shall undertake a monitoring mapping at each level i.e. school, district, and State level.

For effective monitoring and evaluation, a web portal will be developed to enable real time monitoring of the implementation of the project at various levels. The Management at State/National level could view the status of implementation and also provide timely midcourse interventions. Successful innovations, experiences shall also be uploaded on the portal so that all the stakeholders can make use of the best practices or innovations being carried out by various States and Schools.

The PAB at the Ministry of HRD would also function as the Monitoring Committee. In addition, the SIETs, CIET, RIEs and the State/UT Government submitting the proposal would be required to submit progress report every quarter.

CURRICULUM FRAMEWORK:

Two-Year B.Ed. Programme (By NCTE)

Course EPC 3: Critical Understanding of ICT:

Preparing teachers to use technology in a classroom is an important step for ICT enabled education in the country. This course will focus on moving beyond computer literacy and ICT-aided learning, to help student-teachers interpret and adapt ICTs in line with educational aims and principles. It will explore ICTs along three broad strands; teaching learning, administrative and academic support systems, and broader implications for society. ICTs have often been seen as a standalone subject, consisting of a finite set of proprietary applications, taught to children directly by technology experts, bypassing teachers, which has diluted possibilities of teacher's ownership, enhancement of expertise and engagement. Seeing ICTs as an important curricular resource and an integral part of education, according primacy to the role of the teacher, ensuring public ownership of digital resources created and used in education, taking a critical perspective on ICTs as well as promoting constructivist approaches that privilege participation and co-creation over mere access, are principles that the course will help teachers explore. Applying these principles can support Teacher Professional Development models that are self-directed, need-based, decentralized, collaborative and peer-learning based, and continuous, in line with the NCFTE, 2009 vision for teacher education. Since ICTs are technologies, along with developing such understanding, the course will also help student-teachers to learn integrating technology tools for teaching learning, material development, developing collaborative networks for sharing and learning. This learning can help integrate pre-service and in-service teacher education, address traditional challenges of teacher isolation and need for adequate and appropriate learning resource materials (MHRD,

2012). The course will explore use of ICTs to simplify record keeping, information management in education administration.

Curriculum Framework: D.Ed. Programme (by NCTE)

Course: Pedagogy across the Curriculum

Unit 4: Critical Study of ICTs and Developing Capacities:

Critical examination of the role of ICT in education and society.

Capacity development in the use of ICTs.

ICT – based teaching-learning approaches in schools and for teacher professional development.

CONCLUSION:

Communication and information sharing/ storing are basic social processes; new digital Information and Communication Technologies (ICTs), by making these easier and cheaper, have significantly impacted and are impacting our socio-cultural, political and economic spheres (Castells, 2011). The course will help student-teachers to develop an understanding of the shift from an ‘industrial society’ to a ‘post industrial information society’, where the production and consumption of information is both easier/ simpler as well as important (DSERT Karnataka, 2012). This change has positive and negative implications and possibilities for democracy, equity and social justice, all core components of our educational aims. The course will help student-teachers reflect critically and act responsibly to prevent how ICTs are used to support centralisation and proprietization of larger knowledge structures; it will show student-teachers how ICTs can be adapted to support decentralized structures and processes, as well as build the ‘digital public’ to make education a participatory and emancipatory process (Benkler, 2006).

References

- ICT in Education Curriculum for Students; *Central Institute of Educational Technology*, NCERT.
- Ila Rani (2016): Enhancing the Quality in Education by Implementing ICT in the Schools: RTE Act-2009. *The Signage –A Refereed Research Journal of Education & Social Sciences*, Volume 4, No. 1, Jan-June 2016.
- Krishnaveni, R. (Dr.), Meenakumari, J. (2010): Usage of ICT for Information Administration in Higher Education Institutions – A Study: *International Journal of Environmental Science & Development*, Volume 1, No. 3, August 2010.

- Patra, J. N. (2014): The Role of ICT in Improving the Quality of School Education in India. International Educational E-Journal Volume III, Issue II, April – June 2014.
- Samagra Shiksha; *An Integrated Scheme for School Education*, Ministry of Human Resource Development Department of School Education and Literacy in India.
- Singh, J. (Dr.) (2015): Role of ICT in Education. - International Journal of Advance Research in Education, Technology & Management, Volume 3, No. 3, June 2015.
- Sharma, S. (2014): Integration of ICT in Teacher Education - International Page 22 of 24 Journal of Innovation and Scientific Research, pp. 354-356, Volume 9, No. 2, September 2014.
- Shah, M. (2007): E-governance in India: Dream or reality. International Journal of Education and Development using ICT [Online], Volume 3(2).