National Policy on Information and Communication Technology in School Education

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Ministry of Human Resource Development
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Preamble

The *National Policy on Education* 1986, as modified in 1992, stressed the need to employ educational technology to improve the quality of education. The policy statement led to two major centrally sponsored schemes, namely, Educational Technology (ET*)* and Computer Literacy and Studies in Schools (CLASS*)* paving the way for a more comprehensive centrally sponsored scheme – Information and Communication Technology @ Schools in 2004. Educational technology also found a significant place in another scheme on upgradation of science education.   The significant role ICT can playin school education has also been highlighted in the *National Curriculum Framework* 2005 (NCF) 2005.

Use of ICT for quality improvement also figures in Government of India's flagship programme on education, *Sarva Shiksha Abhiyan (SSA).* Again, ICT has figured comprehensively in the norm of schooling recommended by the *Central Advisory Board of Education* (CABE), in its report on *Universal Secondary Education*, in 2005.

With the convergence of technologies, it has become imperative to take a comprehensive look at all possible information and communication technologies for improving school education in the country. The comprehensive choice of ICT for holistic development of education can be built only on a sound policy. The initiative of *ICT Policy in School Education* is inspired by the tremendous potential of ICT for enhancing outreach and improving quality of education. This policy endeavours to provide guidelines to assist the States in optimizing the use of ICT in school education within a national policy framework.

Vision, Mission and Policy Goals

VISION

The ICT Policy in School Education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and global competitiveness.

MISSION

To devise, catalyse, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system

POLICY GOALS

To achieve the above, the ICT Policy in School Education will endeavour to:

CREATE

- an environment to develop a community knowledgeable about ICT

- an ICT literate community which can deploy, utilise, benefit from ICT and contribute to nation building

- an environment of collaboration, cooperation and sharing, conducive to the creation of a demand for optimal utili*sation of and optimum returns* on the potentials of ICT in education.

PROMOTE

- universal, equitable, open and free access to a state of the art ICT and ICT enabled tools and resources to all students and teachers

- development of local and localised quality content and to enable students and teachers to partner in the development and critical use of shared digital resources

- development of professional networks of teachers, resource persons and schools to catalyse and support resource sharing, upgradation, and continuing education of teachers; guidance, counselling and academic support to students; and resource sharing, management and networking of school managers and administrators, resulting in improved efficiencies in the schooling process

- research, evaluation and experimentation in ICT tools and ICT enabled practices in order to inform, guide and utilise the potentials of ICT in school education

- a critical understanding of ICT, its benefits, dangers and limitations.

MOTIVATE AND ENABLE

- wider participation of all sections of society in strengthening the school education process through appropriate utilisation of ICT.

What is ICT?

Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realising the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system.

These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems.

These will also include processes for digitisation, deployment and management of content, development and deployment of platforms and processes for capacity development, and creation of forums for interaction and exchange.

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Information and Communication Technology in School Education

4.1 CHALLENGES AND ISSUES

Challenges before the Education System in India

Concerns of reach and access to education continue to attract widespread attention of all segments of society. Following sustained initiatives spread over many decades, the country can today boast of perhaps one of the largest ever schooling systems. With increased throughput, and ever increasing numbers of students aspiring for higher education, concerns of equity in education and issues of quality have also begun to attract attention.

The challenge of developing alternate modes of education, continuing education, teacher capacity building, information systems for efficient management of the school system are being addressed. With Information and Communication technologies becoming more accessible, reliable and mature, the prospect of leveraging ICT for education is becoming increasingly feasible.

Information and Communication Technologies in Schools

Information and Communication Technologies have enabled the convergence of a wide array of technology based and technology mediated resources for teaching learning. It has therefore become possible to employ ICT as an omnibus support system for education. The potential of ICT to respond to the various challenges the Indian education system poses are:

1. ICT can be beneficially leveraged to disseminate information about and catalyze adaptation, adoption, translation and distribution of sparse educational resources distributed across various media and forms. This will help promote its widespread availability and extensive use.

2. There is an urgent need to digitize and make available educational audio and video resources, which exist in different languages, media standards and formats.

3. Given the scarcity of print resources as well as web content in Indian languages, ICT can be very gainfully employed for digitizing and disseminating existing print resources like books, documents, handouts, charts and posters, which have been used extensively in the school system, in order to enhance its reach and use.

4. ICT can address teacher capacity building, ongoing teacher support and strengthen the school system's ability to manage and improve efficiencies, which have been difficult to address so far due to the size of the school system and the limited reach of conventional methods of training and support.

5. Using computers and the Internet as mere information delivery devices grossly underutilizes its power and capabilities. There is an urgent need to develop and deploy a large variety of applications, software tools, media and interactive devices in order to promote creative, aesthetic, analytical and problem solving abilities and sensitivities in students and teachers.

4.2 ICT LITERACY AND COMPETENCY ENHANCEMENT

The policy defines ICT Literacy in terms of levels of competence. Based on the stage of schooling at which a student or teacher is introduced to ICT, they may progress to different levels. These levels are suggestive and adaptations must be made to suit local conditions. The levels do not correspond to specific classes (for eg, sixth or seventh standard) and time duration must also be locally determined. Also, these levels must be revised periodically to keep pace with changing technology.

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 e-mail 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 etc.

Stage 3: Advanced

Use different software applications to enhance ones 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.

Note: The above stages constitute a general set of competencies for all students and teachers. ICT as an elective subject at the plus two stage will have its own distinct curriculum and competency set.

As each stage is defined by competencies to be achieved, the pace is dependent on frequency of access to the ICT facilities. Based on the local situation, the time duration needed for each stage will be shortened. Different parts of each stage can also run concurrently. In any case, an attempt will be made to ensure every student completes the Advanced stage before completing schooling. The competencies will also guide ICT curricula for teachers.

4.2.1 A programme of ICT literacy will be implemented across all secondary schools in the States, both government and private within the XII plan period.

4.2.2 A model Curriculum for ICT in Education (CICT) will be developed at National Level and States will be encouraged to adopt/adapt it.

4.2.3 States will develop an ICT literacy curriculum and appropriate course materials mapped to the stages mentioned above for uniformity. These will be in the form of self-instructional materials, enabling students and teachers to process them on their own. The ICT literacy programme will endeavour to provide a broad set of generic skills and conceptual knowledge and not focus on mastering the use of specific software applications.

4.2.4 The Boards of Secondary Education will develop a suitable scheme of Evaluation. ICT would be an additional subject together with the award of a certificate of proficiency.

4.2.5 The ICT Literacy programme will be extended to the upper primary stage by the end of the XII plan period. However States may take up this expansion earlier, based on resource availability and capacity of the system.

4.2.6 A dedicated teacher with appropriate qualification will be engaged in each school. This teacher will also function as the ICT coordinator of the school where ICT literacy is to be imparted. With the growth of infrastructure in the school, a suitably qualified technical assistant may also be provided.

4.2.7 All teachers in a school will be expected to become advanced users of ICT (see 4.2 above) integrating ICT skills into their professional development as well as their teaching learning practices across all areas of the curriculum.

4.3 ICT ENABLED TEACHING – LEARNING PROCESSES

4.3.1 ICT enabled teaching-learning encompasses a variety of techniques, tools, content and resources aimed at improving the quality and efficiency of the teaching-learning process. Ranging from projecting media to support a lesson, to multimedia self-learning modules, to simulations to virtual learning environments, there are a variety of options available to the teacher to utilise various ICT tools for effective pedagogy. Each such device or strategy also involves changes in the classroom environment, and its bearing on effectiveness. Availability of a wide range of such teaching-learning materials will catalyse transformation of classrooms into ICT Enabled classrooms.

4.3.2 Teachers will participate in selection and critical evaluation of digital content and resources. They will also be encouraged to develop their own digital resources, sharing them with colleagues through the digital repositories.

4.3.3 In schools equipped with EDUSAT terminals, DTH or other media devices, relevant activities will be planned and incorporated into the time schedule of the school.

4.3.4 Initially the teachers may use the Computer lab for teaching-learning but progressively more classrooms will be equipped with appropriate ICTs, making way for ICT Enabled classes.

4.4   ELECTIVE COURSES AT THE HIGHER SECONDARY LEVEL

4.4.1 States will initiate the process of launching/creating courses in different areas of ICT for the higher secondary stage. The courses will factor in the requirements of students of different streams, including academic and vocational streams (see 8.2).

4.4.2 Courses will be modular in design to enable students to select appropriate software applications based on current needs of higher education and job prospects. Courses will be revised frequently to keep pace with emerging trends in ICT.

4.4.3 A Post Graduate teacher with appropriate qualifications to teach these courses will be appointed.

4.4.4 An ICT Lab attendant/technical assistant with appropriate qualifications will be appointed to manage the ICT/Multimedia Resource lab.

4.5 ICT FOR SKILL DEVELOPMENT

(vocational and job oriented areas of general education)

4.5.1 Job oriented courses in ICT will be developed and established for students of the vocational stream at the higher secondary level by linking them with the need of ICT enabled industries/establishment in the neighbourhood.. The scope of these courses would be a broad based ICT literacy. It will not be limited to ICT based occupations, but will inform and enhance productivities in a wide range of other occupations (for example, accounting, office automation, office communication, data handling and data processing, desktop publishing, graphics and designing, music and video, etc). This will also include courses on cyber security.

4.5.2 The courses will be modular and students will be provided a wide range of choices, catering to a variety of job options, hardware and software platforms, tools and resources. Appropriate mechanisms to counsel students in selecting career paths and courses will be developed simultaneously. The courses will be in conformity with the National Vocational Education Qualifications Framework (NVEQF).

4.5.3 The courses will be frequently revised and updated in order to maintain relevancy to changing requirements of the job market and emerging trends in technology. Hence it will also be imperative to conduct such courses in close liaison with industry.

4.5.4 The institutions offering Vocational courses will be required to integrate ICTs in their teaching-learning process.

4.5.5 An open learning system will be developed permitting students to continue to reskill themselves. Conventional restrictions of age and previous qualifications will be suitably reworked to facilitate an open system. Where feasible, online and distance modes will also be explored. Lateral and vertical mobility will be established amongst the courses with multiple entry and exit options.

4.5.6 A system of On-demand evaluation and certification, to enable students to obtain timely qualifications will be developed.

4.6 ICT FOR CHILDREN WITH SPECIAL NEEDS

4.6.1 Use of ICT will catalyse the cause and achieve the goals of inclusive education in schools.

4.6.2 ICT software and tools to facilitate access to persons with disabilities, like screen readers, Braille printers, etc. will be part of the ICT infrastructure in all schools. Special care will be taken to ensure appropriate ICT access to students and teachers with special needs.

4.6.3 All teachers will be sensitised to issues related to students with special needs and the potential of ICT to address them. All capacity building programmes will include components of ICT enabled inclusive education.

4.6.4 All web based interfaces developed for the programme including digital repositories, management information systems, etc. will conform to international guidelines for accessibility.

4.6.5 Accessibility norms will be adopted as per the world wide web consortium, W3C guidelines (Web Content Accessibility guidelines, http://www.w3.org) to enable the content to be accessed by children with special needs. Web based digital repositories with W3C compliance will address the lack of availability of resources for persons with disabilities. Digital content and resources, for the exclusive use of persons with disabilities, talking books for example, will also be developed and deployed.

4.6.6 The absence of appropriate vocabulary for different subject areas in the different Indian languages and the unfamiliarity of the cultural context can make digital communication and resources inaccessible to students and teachers across the country. Efforts will be initiated to develop appropriate word lists and dictionaries in Indian languages and wide spread translations encouraged.

4.7 ICT FOR OPEN AND DISTANCE LEARNING

4.7.1 Open and Distance Learning with the use of ICT opens out alternate possibilities for students who have dropped out, cannot continue formal education or are students of the non-formal system of education. Existing formal systems of Education will be strengthened with ICT based instruction available in Open and Distance Learning Systems so as to cater to the needs of such learners .

4.7.2 Present Open Schooling systems (e.g. National or State level Open Schools) will be strengthened by harnessing ICTs innovatively. Access to e-books, digital learning resources, Digital Repositories (with relevant learning resources) etc. will be developed by these institutions as student support services. This will also be used for online capacity building for open and distance teacher training.

4.7.3 All Open and Distance Learning Systems will be automated and provide online, all services including admissions, examinations, e-Accreditation and grievance redressal on the lines of the National Institute of Open Schooling.

4.7.4 The proposed mentoring system for students involving expert teachers will be extended to these students also. Online courses, online on demand exams, and digital repositories and content, media broadcasts planned through DTH/Satellite based, open learning systems allowing multiple entry and exit points, opening out the school resources to non-formal students, guidance and counselling, will result in effective use of ICT for open and distance learning.

ICT for School Management

5.1 AUTOMATED AND ICT MANAGED SCHOOL PROCESSES

States will adopt or adapt an e-governance and automated school administration programme for schools, build capacities for its implementation and deploy school based Management Information Systems (MIS). These MIS will be integrated with the proposed state wide web based School Education Management Information System.

A school wide local area network enables automation of a variety of processes. Beginning with library automation, locally cached offline access to internet resources, office automation, maintenance of records, student tracking, resource planning, using the existing ICT infrastructure will increase efficiencies. At the same time, savings in cost, time and effort will also accrue. The school wide local area network will be used to facilitate this automation.

5.2 SCHOOL MANAGEMENT INFORMATION SYSTEM (SCHOOL MIS)

5.2.1 A nation wide network will be established in which schools, teachers, students, school managers, and the community at large participate. This implementation will include the School Management Information Systems (School MIS); digital repositories of tools, content and resources; professional development and continuing education platforms; and guidance, counselling and other student support services.

5.2.2 School MIS will emerge as a single window clearing house on all information related to the secondary school system. The information will facilitate research and analysis activities and guide decision making at different levels in the education system, contributing to enhanced efficiencies.

5.2.3 The scope of information to be collated by the MIS will be broad and include student and teacher tracking, particularly for their academic needs. The norms will also define standards of technology including language fonts, word processors, technical dictionaries, etc. Open standards facilitating universal access to information, content and resources will be ensured.

6

ICT Infrastructure

There will be two types of Infrastructure:

- Core ICT Infrastructure
- Enabling Infrastructure

6.1 HARDWARE

6.1.1 The States will establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools

6.1.2 Based on the size of the school, needs of the ICT programme and time sharing possibilities, States will define an optimum ICT infrastructure in each school. Not more than two students will work at a computer access point at a given time. At least one printer, scanner, projector, digital camera, audio recorders and such other devices will be part of the infrastructure.

6.1.3 Each school will be equipped with at least one computer laboratory with at least 10 networked computer access points to begin with. Each laboratory will have a maximum of 20 access points, accommodating 40 students at a time. The ratio of total number of access points to the population of the school will be regulated to ensure optimal access to all students and teachers.

6.1.4 In composite schools, exclusive laboratories with appropriate hardware and software will be provided for the secondary as well as higher secondary classes.

6.1.5 In addition, at least one classroom will be equipped with appropriate audio-visual facilities to support an ICT enabled teaching-learning.

6.1.6 Appropriate hardware for Satellite terminals will be provided to selected schools in a progressive manner.

6.1.7 Computer access points with internet connectivity will be provided at the library, teachers' common room and the school head's office to realise the proposed objectives of automated school management and professional development activities.

6.1.8 ICT enabled education can be significantly enhanced and the range of classroom practices expanded with the introduction of digital devices like still and video cameras, music and audio devices, digital microscopes and telescopes, digital probes for investigation of various physical parameters. These will also form a part of the infrastructure. States will make appropriate choices and promote the use of such devices in classrooms.

6.2 NETWORK AND CONNECTIVITY

6.2.1 All computers in the school will be part of a single local area network to enable optimum sharing of resources. In addition to the laboratory, internet connections will also be provided at the library, teachers' common room and the school head's office.

6.2.2 Each school will be serviced with broadband connectivity capable of receiving streaming audio and video, a range of digital learning resources and interactive programmes. The number of computers given internet connectivity will be governed by the available bandwidth, in order to ensure adequate speeds. A mechanism to have offline access to internet content will be set.

6.2.3 Teachers and students will be educated on issues related to the safe use of internet Firewalls and other security measures will be implemented to guard the school network against cyber attacks and misuse of the ICT facilities. Appropriate guidelines for network security will be developed.

6.2.4 An EDUSAT network will be planned at each state with interactive terminals (SIT) and recieve only terminals (ROT)

6.3 SOFTWARE

6.3.1 A software environment favouring a pedagogy of learning which promotes active learning, participatory and collaborative practices and sharing of knowledge is essential to nurture a creative society. Free and Open Source Software – operating system and software

applications will be preferred in order to expand the range of learning, creation and sharing.

6.3.2 A wide variety of software applications and tools, going well beyond an office suite is required to meet the demands of a broad based ICT literacy and ICT enabled teaching learning programme. Graphics and animation, desktop publishing, web designing, databases, and programming tools have the potential of increasing the range of skills and conceptual knowledge of the students and teachers. A judicious mix of software applications will be introduced in schools.

6.3.3 Creation and widespread dissemination of software compilations, including specialised software for different subjects, simulations, virtual laboratories, modelling and problem solving applications will be encouraged. These will be distinct from multimedia packages and digital learning resources.

6.4 ENABLING INFRASTRUCTURE

6.4.1 The enabling infrastructure required to efficiently maintain the ICT facility will be defined, established and maintained.

6.4.2 Regular and regulated supply of electricity, appropriate electrical fixtures, adequate power backup and support, including alternate sources of energy, where needed, will be ensured. Students and teachers will also be trained in the safe use of electrical outlets and fittings.

6.4.3 Physical facilities like an adequately large room, appropriate lighting and ventilation, durable and economic furniture suitable for optimisation of space and long hours of working will be established. Alternate layouts and arrangements facilitating interactions amongst students and with the teacher will be encouraged.

6.4.4 Adequate safety precautions and rules for use will be established. Each laboratory will be equipped with a portable fire extinguisher and students and teachers trained in its use. An appropriate fire drill will also be implemented.

6.4.5 All the equipment and resources will be secured from theft and damage. They will also be covered under an appropriate insurance policy against theft and damage.

Digital Resources

7.1 DIGITAL CONTENT AND RESOURCES

7.1.1 The state shall endeavour to provide universal, equitable, open and free access to ICT and ICT enabled tools and resources to all students and teachers. All digital learning resources and software resources will conform to the National Policy on Open Standards of the Government of India (http://egovstandards.gov.in).

7.1.2 Given the diversity of the country's educational, linguistic and social situation, there exists a need for a wide variety of digital content and resources for different subjects, curriculum, ages/grade levels and languages. Unicode fonts will be used to ensure universal access, compatibility and amenability to transliteration and translation.

7.2 DEVELOPMENT OF CONTENT

7.2.1 Use of interactive ICT tools for teaching and learning, e.g. virtual laboratories will be promoted. The development of digital learning resources in the form of e-books, animations, lessons, exercises, interactive games, models and simulations, videos, presentation slides, plain text materials, graphics, or any combinations of the above, will be encouraged. Use of digital resouces should be harmonised with the requirements of the curriculum and supplement it.

7.2.2 The proposed web based digital repositories will host a variety of digital content, appropriate to the needs of different levels of students and teachers.

7.2.3 Raw content resources like photographs, video, audio and animations will be remodelled to develop multimedia learning objects.

7.2.4 Teachers and students will be encouraged to develop digital learning resources collaboratively and contribute to the proposed digital repositories, collectively owning it.

7.2.5 Textbooks, teachers'/students' guides, question banks, FAQs, laboratory manuals, problem sets, activities, notes and a variety of other print based learning resources available in the public domain will be digitised and deployed on the national and state level web based digital repositories.

7.2.6 Educational standards and instructional designs for a variety of digital content and resources will be widely disseminated to enable development of quality digital content, including interactive multimedia materials and learning objects.

7.3 SHARING AND DISSEMINATION OF DIGITAL CONTENT

7.3.1. Widespread sharing and dissemination of digital content will promote infusion of ICT into classroom practice. Suitable open standards for interoperability, web based sharing and appropriate norms for free access will be defined to catalyse use of digital content and resources.

7.3.2 Collections of digital content and resources will be deployed on web based digital repositories, which will be universally accessible. Private Public partnership projects for the same could be encouraged. State level and National level repositories will be developed and maintained. Emphasis will be placed on multi lingual digital learning resources development in State Regional Languages with facilities for translation to other languages so as to optimise time, effort and cost. Content Delivery Networks will be developed to enable transmission of content from multiple locations.

7.3.3 National level organisations like Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT). Indira Gandhi National Open University (IGNOU) and State level organisations like State Institutes of Educational Technology (SIETs) will play a proactive role in developing and sharing of digital content and its source code to support wide scale adaptations. They will also support the capacity building activities of teachers in digital content development and usage.

7.3.4 Content developed by state funded projects and programmes will be deployed along with source code under appropriate licensing norms (like the creative commons) to facilitate open and free access to these resources. This will also help avoid duplication of efforts in different States.

7.3.5 Digital content, software applications and resources developed by private individuals, agencies or groups to be used in the school system will be subject to validation for accuracy of content and pedagogical suitability by organisations like NCERT, SCERT, and Boards of Secondary Education. A mechanism for procurement along with source code and rights will be evolved.

7.3.6 Teachers and students will be oriented to prevailing copyright regimes, different types of restrictions on reuse of content and the need to respect copyright. Teachers and students will also be educated about alternate forms of licences like the creative commons and encouraged to use them.

7.4 ROLE OF SCHOOL LIBRARY

7.4.1 The library in the school will search, collate and categorise digital resources and make them available to the teachers and students. For instance, the school library will develop lists of web resources or advisories for ICT usage or teaching learning of different subjects. The school library will be automated for facilitating access to a variety of digital resources. An automated library with internet access will catalyse the use of digital resources in all class rooms.

Capacity Building

8.1 CAPACITY BUILDING OF IN-SERVICE TEACHERS

8.1.1 Capacity building of teachers will be the key to the widespread infusion of ICT enabled practices in the school system. A phased programme of capacity building will be planned. In service training of teachers will comprise of Induction Training as well as Refresher Courses. The induction trainings will be imparted by the Regional Institutes of Education of the NCERT, State Councils of Educational Research and Training (SCERTs) or such other institutions of the Central and State Governments and will preferably be completed before the commencement of the academic year. The refresher trainings will be carried out every year to enable teachers to share, learn and keep abreast of the latest trends in ICT based teaching learning processes. The induction training will be followed by teacher's evaluation to ensure that the minimum competency is achieved.

8.1.2 Training in ICT will be integrated with general training programmes organised for teachers and school leaders at all levels in order to popularise its use and to demonstrate effective practices in ICT.

8.1.3 Beginning with an initial sensitisation through ICT operational skills and ICT enabled subject teaching skills, teachers will become part of online professional groups (e.g. English teachers association) to continue their education, pool in their resources and actively contribute to the strengthening of domain specific knowledge within the country. The forums will also facilitate continuous development of ICT skills introducing them to tools and resources in different subjects / specialisations as well as create and share learning resources in those subjects.

8.1.4 Teacher participation in the digital content development process will catalyse its broad based usage in the classrooms. Teacher capacities will be developed in instructional design, selection and critical evaluation of digital content, and strategies for effective use of digital content to enhance student learning.

8.2 CAPACITY BUILDING THROUGH PRE-SERVICE TEACHER EDUCATION

8.2.1 Teacher educators will be suitably oriented and trained to use ICT in their pre-service teacher training programmes. They will also be expected to enable pre-service teachers to be sensitised to and practice the use of ICT.

8.2.2 All pre-service teacher education programmes will have a compulsory ICT component. The existing curricula for pre-service teacher's training will be revised for including appropriate and relevant applications of ICT. All teacher trainees passing out of teacher education programmes will obtain adequate levels of competency in ICT and ICT enabled education (see 4.2 above). This proficiency will gradually form a part of the eligibility criteria for teacher appointments.

8.2.3 National Council for Teacher Education (NCTE) has already laid down guidelines about availability of ICT infrastructure in each such training institution. NCTE would prescribe appropriate curriculum in ICT corresponding to the ICT curriculum in schools, to be revised periodically, for such teachers.

8.3 CAPACITY BUILDING OF SCHOOL HEADS

8.3.1 School heads will play an important role in establishment and optimal utilisation of ICT and ICT enabled education practices in the school. All school heads will undergo appropriate orientation in ICT and ICT enabled education training programmes. This will also help them in building up digital resources for the school.

8.3.2 School heads will also be trained in processes leading to automation of administration, management and monitoring of the school system and will play a proactive role in the implementation of School Education Management Information System (SEMIS).

8.3.3 School heads will be oriented to ensure the upkeep and safety of the ICT infrastructure and the optimum use of the ICT facilities.

8.4 CAPACITY BUILDING OF STATE / DISTRICT EDUCATION DEPARTMENT PERSONNEL

8.4.1 States / Districts Education Department personnel at all levels will be oriented to infuse ICT into their work. They will also be oriented to various aspects related to the ICT implementation at the school level, SEMIS and sustenance of the ICT infrastructure.

8.4.2 School clusters encompassing neighbourhood schools will be established for sharing and learning from each other aiming to hasten the process of integration of ICT into all aspects of the school system.

9

Implementing and Managing the Policy

9.1 PROGRAMME MONITORING AND EVALUATION GROUP (PMEG)

9.1.1 Programme Monitoring and Evaluation Group **(**PMEG) of the Department of School Education & Literacy, Ministry of HRD, Government of India, will be tasked with the overall responsibility of guiding the implementation of the ICT programme in schools across the country. The PMEG may set up task groups and invite institutions or established professionals with substantial expertise in that sector to develop norms, specifications, guidelines, evaluation reports, white papers etc. to guide the States in implementing the ICT programme.

9.2 INTER-MINISTERIAL GROUP

9.2.1 An Inter-Ministerial Group consisting of members from the Ministry of HRD, Ministry of Communications and Information Technology, Ministry of Information and Broadcasting, Department of Space, Department of Science & Technology, Ministry of Power, Ministry of New and Renewable Energy, Ministry of Labour and Ministry of Rural Development and such other Ministries dealing with issues related to education, will be set up and tasked with the responsibility of guiding technological choices and specifying cost effective and optimum infrastructure and connectivity.

9.2.2 The group will also review the state of the art technology, connectivity and inter sectoral convergence based on its relevance to educational ICT goals, feasibility of implementation in the school sector, appropriateness in terms of finance, environmental footprints, need for training and learning curves for use and managing the system.

The group will regularly review technological choices and guide the states in making informed investments, maximising the educational benefits.

9.2.3 Technology choice reviews will include standards and norms for computer configuration, input and output devices like scanners, printers and projectors, operating systems and system software applications including virus scans, productivity applications and educational software, power conditioning equipment, and other digital equipment like camera and audio recorders. It would also include norms for Edusat terminals. Norms for pricing of enabling infrastructure like telephone, internet, and electricity will also be considered and states guided in establishment and management of the infrastructure.

9.2.4 The Group will review, from time to time, ICT and education related issues emerging out of Acts and Policies in other sectors, particularly relevant to security, copyright and effective use of ICT and guide States accordingly.

9.3 NATIONAL AND STATE LEVEL AGENCIES

9.3.1 National and State level agencies, like the National Council of Educational Research and Training, the Central Institute of Educational Technology, the National Institute of Open Schooling, the State Councils of Educational Research and Training, the State Institutes of Educational Technology or any other public educational agency designated by the State will develop curriculum, resources, and undertake capacity building programmes, which will serve as models for adaptation and implementation across the system. These activities will not be outsourced.

9.3.2 All public funded National and State level agencies will partner in developing, compiling and making available digital content, resources and tools. Norms for quality, universal open access for different types of digital content will be defined.

9.3.3 Public funded broadcast agencies at the National and State level and agencies managing the EDUSAT networks will be engaged with to ensure wider dissemination of support services and resources.

9.4   ROLE OF THE STATES

The States will have a two fold task:

- Define norms, standards, guidelines and frameworks to implement the policy in an effective manner

- Facilitate and monitor the implementation of the policy in an effective manner

These tasks will include:

- A programme of action, an appropriate road map and a feasible time line

- Guidelines based on national standards and norms for infrastructure, implementation processes at various levels, capacity building programmes, monitoring and evaluation criteria, targets, etc.

- Framework for development, selection, evaluation, deployment in repositories, and use of digital content

- Facilitation of wide spread participation of all stake holders, including community and private partners in various aspects of the ICT programme implementation of the policy in an effective manner

- Development, deployment and maintenance of infrastructure and digital repositories

- Development and phased implementation of an appropriate capacity building framework

- Mobilisation of resources including from private and community sources

- Development of an appropriate legal and regulatory framework

- Monitor and evaluate the implementation

These actions will be in conformity with Guidelines issued by the Central Government.

9.5 PROGRAMME OF ACTION

9.5.1 The States will draw up a Programme of action to inform and guide various aspects of the ICT programme, viz., development of infrastructure, management of the programme, development of digital resources, capacity building, monitoring and evaluation of the programme.

9.5.2 Based on a suitable road map and time line, the States shall ensure coverage of all Government and Government aided secondary and higher secondary schools. It will also ensure similar development in all private and unaided schools through the respective State Boards of affiliation. The time line will be broken up into appropriate phases and suitably monitored. The programme will be expanded to the upper primary stage, covering all the schools within an appropriate time frame.

9.5.3 The States will set up an institutional mechanism for implementing the ICT programme under the existing educational system, suitably delegating responsibilities up to the school level. States may experiment with different models based on past experience and appropriateness.

9.6 ADVISORY GROUP

9.6.1 The States' Department of Education will spearhead an advisory group to guide the implementation of the ICT programme , its monitoring and evaluation. The advisory group, will consist of the concerned Departments, a reputed engineering Institute of the State, University Departments, etc taking into consideration the variety of technical, educational, financial and administrative tasks involved.

9.6.2 The States' Department of Education will synergise with the appropriate departments and state level agencies to ensure the establishment of connectivity and electricity in all schools. This will include negotiated norms for pricing, quality of service and maintenance.

9.7 NORMS, STANDARDS AND PROCEDURES

9.7.1 In order to ensure uniform and high standards of ICT, optimum utilisation and cost effective implementations, States will adapt standards and norms suggested by the inter ministerial group at the national level for all aspects of the ICT implementation, in particular the technology mix, specifications of equipment, selection of software and connectivity, selection and deployment of digital resources and capacity building programmes.

9.7.2 Prevailing norms in the State will be utilised to phase out, dispose of or exchange old and obsolete equipment. Care will be taken to minimise avoidable upgradation and generation of electronic waste.

9.7.3 States will draft SLA for procurement, installation, operation and maintenance procedures, and draw up appropriate agreements with the vendor/agency. The MoUs/ agreements will involve strict compliance clauses to ensure quality of equipment and service and minimum downtime. Appropriate Guidelines for SLA developed by the Inter Ministerial Group will form the basis.

9.8 MODELS FOR ICT INFRASTRUCTURE

9.8.1 Build, Own, Operate and Transfer (BOOT) models for ICT infrastructure may be used to maximise coverage of the programme

in schools in the shortest possible time. Different combinations of services like equipment only and equipment + manpower will be tried out and appropriate combination, based on feasibility and cost effectiveness, adopted by the States. Based on prevailing depreciation and obsolescence norms, the State may also choose to use a Build, own and operate (BOO) model to avoid out of date / obsolete equipment in schools.

9.8.2 In view of increasing capacities of regular teachers in integrating ICT and capacity building programmes for teachers, an attempt will be made by States to phase out the requirements of a separate teacher for ICT, except at the +2 level, where ICT is introduced as a separate subject. The State will avoid (and phase out) outsourcing of teacher recruitment to BOOT agencies.

9.8.3 States will explore the possibilities of sharing the infrastructure partly or wholly with the community to extend education or train youth after school hours or similar purposes. Care will be taken to ensure that such usage does not compromise the school's educational or ICT programmes. The BOOT agency and/or the school may also utilise it for augmentation of resources. States will try out and establish appropriate community partnership models for optimum utilisation of infrastructure and resources, while ensuring safety of school property.

9.9 REGULATORY MEASURES

9.9.1 Access to the Internet enhances the risk of inappropriate content reaching children and compromising privacy and identity of individuals. Evolving appropriate advisories for regulating access, monitoring internet activity and education including privacy and security of students and teachers will be taken up at the instance of the Advisory Group. Heads of schools and teachers will be trained in appropriate security and regulatory measures.

9.10 INCENTIVES

9.10.1 The States will draw up an appropriate incentive scheme for teachers, students and schools to recognise, showcase and promote initiative and talent. Easy loan schemes for procuring ICT equipment and resources, awards, professional support packages, and a variety of similar incentives, will be considered. States will also explore the possibility of partnerships and sponsorships with Government and Private agencies like Banks, Corporations and Charitable Institutions.

Financing and Sustainability

10.1 The procurement and utilisation of the ICT infrastructure requires appropriate allocations through both Centrally Sponsored as well as State schemes. These can be supplemented through public private partnerships and as part of corporate social responsibilities. The States will make adequate allocations in their budgets to ensure uninterrupted support to the ICT programme

10.2 Each school will develop an ICT plan, based on local specific requirement, to optimally utilise the infrastructure established in a cost effective manner. This will be based on the learning needs of the students and training requirements of all staff, including teachers and administrators.

10.3 The school level plans will be reviewed at the district/ State to make available adequate resources for raising the quality of education imparted.

10.4 The States will adapt appropriate models of infrastructure, procurement, maintenance to keep the total cost of operation low and optimising investments. It will also ensure optimum utilisation and minimise renewal and upgradation.

10.5 States and local bodies will encourage the participation of individuals and institutions from the private and non-governmental sectors, particularly through their corporate social responsibility programmes in development of infrastructure, development and/or supply of software and content, informing technology choices and capacity building. Their participation will be guided by prevailing Government standards and norms.

10.6 States and local bodies will create the mechanisms to utilise the talents and facilitate the utilisation of voluntary services of professionally qualified youth in the school ICT programme, development of digital learning resources and software tools, and research and evaluation.

10.7 States will maintain a directory of volunteers, resource persons and support institutions for facilitating their participation in the ICT programme.

Monitoring and Evaluation

A mechanism for regular monitoring and evaluation will be made an integral part of the ICT programme. The State advisory group will function as the nodal agency for this process.

11.1 MONITORING

11.1.1 The Advisory Group constituted by the States will identify criteria, performance measures, periodicity of monitoring/ measurement, methodology to be adopted and reporting mechanism.

11.1.2 Monitoring of progress and achievement of physical targets will be an ongoing activity built into the ICT programme. In addition to the national level monitoring of targets and objectives, the respective States would have an internal mechanism for overseeing the implementation of the programme through a monitoring committee constituted for the purpose. The School Education Management Information System (SEMIS) and DISE would be a part of the monitoring tool.

11.2 EVALUATION

11.2.1 An independent third party evaluation of the programme will be undertaken at appropriate stages in the project. The States will identify a suitable agency to carry out the evaluation as per the requirements of the project.

11.2.2 The criteria for evaluation will include various aspects related to each of the segments of the policy, viz., the ICT programme, infrastructure,

digital resources, capacity building and the overall management of the programme. A framework for evaluation criteria will be developed.

11.2.3 University Departments of Education, Educational Technology or ICT related departments will be encouraged by the States to take up research studies on various as4pects, like impact assessment studies of the ICT programme, in order to inform and correct the process.

11.3 SHARING OF RESULTS AND FINDINGS

11.3.1 The results and findings from the monitoring, evaluation and research will be widely disseminated and used not only to correct each aspect of the ICT programme, but also to enable dissemination of best practices.

11.4 POLICY REVIEW

11.4.1 The ICT Policy for School Education recognises the need for frequent revisiting of its provisions. A suitable mechanism to revisit each segment of the Policy will be evolved. The policy will ideally be revised every two years.

11.4.2 A broad mechanism for consultations with all stake holders will be evolved. Inputs from the inter ministerial group, the State advisory groups, the monitoring and evaluation findings, the programme monitoring and evaluation group will be utilised for informing the revision.

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