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**Draft Version 1.0
(Not for Circulation)**

**National Policy
on
Information and Communication Technology (ICT)
in
School Education**

**For
(Remarks and Comments)**



**Department of School Education and Literacy
Ministry of Human Resource Development
Government of India**

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INTRODUCTION

Information and Communication Technologies (ICTs) have made a huge impact on Education in most countries in the World. Substantive investments have been made to put new era technologies in classrooms so that every citizen is equipped with the skills needed to live and work in the new Information World.

However, it is important to understand that integration of new technologies in the existing education mechanisms will require substantial understanding and learning before they can be utilised to bring about maximum outcomes in learning. Governments across the world are eager to adopt ICTs as the most viable vehicle to address the problems of Universalisation of education and have made good strides in that arena.

An integrated approach, using an end to end framework, that will look at all the various issues related to using ICTs in Schools, by identifying Educational objectives, will help governments and schools to make informed decisions about investing in ICTs and realising the maximum benefits that ICTs can bring.

ICTs are revolutionising educational methodologies worldwide. An integration of ICTs is needed in our school education system to accelerate achievement of quality school education for all. Technology in School Education will provide India an opportunity to leapfrog inherent limitations and acquire new resources to formulate innovative strategies.

IT for Change's Comments:

A number of statements in the Introduction are not substantiated and could be strengthened by specific instances and examples. The 'huge impact' needs to be unpacked, in what aspects, and how these are aligned with accepted educational goals. Looking closely at documents like that of the UK policy, the 2nd statement will not be validated, since investments have been made not for skill development (which is a minor aspect of education), but for the holistic goals of education, including citizenship and participation.

Some terms also require further clarification. The document needs to explain its conception of the 'Information World', perhaps explaining how it differs from an 'information society' or knowledge economy? GeSCI's end-to-end framework and the history of its evolution must also be explained in detail. Finally, what is meant by ICTs as a 'viable vehicle' to address problems of universalisation?

The last paragraph is extremely problematic, and the lack of understanding about the potential of ICTs comes sharply into focus. Unlike electricity, or power, ICTs don't just improve efficiencies in current processes, nor do they merely present a platform for innovations. ICTs present the opportunities for redefinition of structures and processes for achieving the basic educational goals. If they are viewed as a way to merely 'do them better' rather than 'do them differently'. then we run the risk of adopting technical solutions as if education were a polluted water source, and ICTs a burst of clean water, while, in fact ICTs present ways for cleaning the well water directly.

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Overall, the introduction must foreground the wider aims of education. An emphasis on skills and work or a limited focus on cognitive learning in narrow areas can be detrimental to overall education aims and achievements.

SECTION 1. VISION

To empower a whole generation of Indians with ICTs and to gear to engage constructively with the knowledge driven economy.

SECTION 2. MISSION

To integrate and leverage ICTs in School Education for improved quality, delivery and administration of primary and secondary education and to build national capacities for the development of an efficient workforce which can contribute effectively to the global knowledge economy.

IT for Change's Comments:

Education is not a means to an end alone, and oversight of this fact is clear in the way that ICTs are being positioned in this whole document. The goals of education are far wider and more fundamental than to create a 'efficient workforce' for a knowledge economy, an idea that is well critiqued in education circles. The vision/mission of the ICT in education policy must necessarily be a function of the aims of education itself, to build and shape society.

The broader vision/mission of education must be acknowledged, for it holds the potential to change the way the 'ICT in education' policy will itself be shaped. 'ICT in education' policy must fully and explicitly derive from education policy, vis a vis documents like the NPE, POA, NCF and their perspectives on education, society, and children. The draft document lacks sufficient acknowledgement of the contributions of its predecessors in education policy

ICT has enormous potential to transform the processes of learning, but a different approach must be taken to achieve this. Thus the formation of 'ICT in education policy must be led by individuals and organisations who understand and are committed firstly to education and learning (and who may not understand ICT) rather than vice versa.

SECTION 3. GUIDING PRINCIPLES

This policy aims to lay down the following guiding principles to ensure effective use of ICTs in school education.

IT for Change's Comments:

The aim of the draft policy should not only be to 'ensure effective use of ICTs'. Prior to that, a discussion is necessary on what are the aspects that can be addressed through the use of ICTs. A discussion on efficacy of use can occur only after a discussion on the actual priorities and possibilities for their use.

3.1 Self-Learning (Learner-centric)

To increase the flexibility of learners and educators to address individual needs and preferences in school education.

IT for Change's Comments:

Pedagogy suggests that children often learn better in groups and on an individual basis, so this principle must address to what extent learning is assumed to be an individual process and how ICTs working on an individual mode rather than with student groups can offer better learning opportunities. The draft policy should consider both concept – the teacher-student dynamic, which doesn't only restrict it to learner centrism, and also the collective learning dynamic – and the potential role that ICTs have to play in both of these aspects..

3.2 Accessible

To use ICTs to expand access to education opportunities of blended learning (Text book based and ICTs) to each child, including girls, physically challenged children, learners residing in remote areas and those belonging to socially disadvantaged sections.

IT for Change's Comments:

The draft policy must evaluate the costs and benefits of expanding ICT access and expound on the ICTs that have been mentioned, particularly with regards to how these and other ICTs will impact gender discrimination and other socially disadvantaged sections. Since the idea is integration into publicly funded education endeavours, the access issue needs to be considered at a more micro level and for that the access concept has to be more nuanced more.

3.3 Equitable

To use ICT infrastructure and technology applications in schools to leverage the delivery of quality education to all.

IT for Change's Comments:

This statement needs support to explain what are the technology applications mentioned here and how they will leverage delivery of quality education.

3.4 Accountable

To use ICTs to increase the flexibility of educators and administrators in the school education system and enhance efficiency and performance in education delivery.

IT for Change's Comments:

The principle of accountability should address the details of 'education delivery' and how its efficiency and performance are enhanced by ICTs, as well as how ICTs increase flexibility of educators and administrators. Merely introducing digital reporting and information systems will not become meaningful, since accountability is a two-way process. If the teachers are going to be accountable, they will need to be accountable to another group – parents, community, governments, etc.

3.5 Collaborative:

To use ICTs to build relationships and foster multi-stakeholder partnerships with all involved in the field of education to contribute towards universalising school education.

IT for Change's Comments:

Although in principle, collaboration is a good thing, without corresponding systems and processes, it will not take off. For example, in UK policy for ICTs in School Education, collaboration and sharing is seen as a an acitivity that connects schools, families and the larger community. This requires technical solutions, no doubt, but more importantly, a policy direction for open sharing and appropriation at various levels. Such policy direction should explain in detail in what way will it foster partnerships and who are the stakeholders involved in the partnerships.

3.6 Innovation and Research

To use ICTs to achieve educational goals through identification and evaluation of existing educational technologies and where appropriate, adoption of emerging technologies and promising practices into our education delivery system.

IT for Change's Comments:

In the process of identifying such practices and technologies, it is necessary to make the process inself clear, including identifying those who will be the decisions, whether they are teachers who have used technologies over time and make their needs known or technology vendors trying to sell one-size-fits-all technologies.

SECTION 4: BACKGROUND

4.1 Rationale for ICTs in School Education

ICTs have the potential to contribute to different facets of educational development in schools; revolutionizing the delivery of quality education, teacher training, and students' achievements towards a new paradigm of effective learning for all, any time, anywhere.

The Policy recognizes the significant shift all over the world, from the use of technology as a delivery device for school children to use of technology as a tool for exploration for knowledge and self-learning.

The emergence and convergence of various ICTs such as radio, television, computer, the Internet, telephone, cell phone, video, multimedia, CD-ROM, software and hardware provide unique opportunities for promoting primary and secondary education, on a mass scale, in India. ICT literacy to all school students will make each student competent with 21st century skills. ICTs as a tool for effective classroom teaching will make learning fun and prepare today's students to be tomorrow's workforce.

IT for Change's Comments:

The rational for ICTs in school education lacks specificity and employs some problematic terms. Training students to be tomorrow's workforce employs a limited vision of ICTs, and the concepts of 'ICT literacy' and '21st century skills' need elaborating.

ICT literacy is certainly important, but ICTs cannot simply be introduced to improve efficiencies in the current school system, with the uninformed belief that this will remedy the lack lustre educational system of the day. Actually, ICT literacy is a small part of the whole story. If we cease to see ICTs with that narrow viewpoint, we can begin to appreciate their potentialities, and then educators also will perceive the deep-rooted change to systems and learning that is possible.

4.2 ICT Education in India

Strengthening the ICT-based School Education in the country at school level is one the major initiatives undertaken by MHRD. In 1970, the Ministry of Education, took up a scheme of Education Technology (ET). Under this scheme, an ET unit in the Ministry, a Center for Educational Technology (CET) under NCERT, and ET cells in six states were set up in 1974.

One of the earliest systematic and large-scale efforts in India to run an educational programme with ICTs was SITE (Satellite Instructional Television Experiment) in 1975–76. The launch of the **Indian National Satellite (INSAT)** in 1980, and its availability for educational purposes, an Educational Technology Division in the Ministry of HRD was set up; Central Institute of Educational Technology (CIET) came into picture; State Institutes of Educational Technology (SIETs) and ET cells were opened in states. CIET was charged with the task of undertaking educational television and radio production, conducting training and research, and performing as a central coordination agency for all production and utilization efforts. Television and radio sets were supplied to schools over many years. AIR and Doordarshan were chosen as the carriers of the broadcasts.

During 1984-85 the **Computer Literacy And Studies in Schools (CLASS)** Project was introduced. A total of 12,000 computers were distributed to secondary and senior secondary schools through the State Governments. During the 9th Plan period, CLASS scheme was discontinued and a revised scheme was launched during 2001-02.

National Task Force on Information Technology and Software Development constituted in 1998 made specific recommendations on introduction of IT in the education sector including schools. The Report recommended provision of computer systems to all educational institutions up to Higher Secondary/Secondary Schools by suitable investments (about 1-3%) of the total budget during the next five years. The centrally sponsored scheme of 'Educational Technology' and 'CLASS' then suitably modified keeping in view the past experience, the feedback and changing needs to form the new scheme of '**ICT in Schools**'.

A large number of institutions exist with educational technology components in one form or another - CIET, SIETs, state ET cells, SCERTs, and more than 450 DIETs. The Regional Institutes of Education (RIEs) of NCERT also have educational technology cells. More than 250 universities offer education technology as an optional subject in B.Ed. and M.Ed. Courses. Technical Teachers Training Institutes (TTTIs) also have facilities for technical education. Several state open schools, the National Institute of Open Schooling (NIOS), several state open universities, the national open university, IGNOU, and the

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distance education departments of conventional universities all have facilities to provide learning through alternative modes. However, there is need to learn to collaborate, share, and revitalize themselves in order to meet the educational challenges that the future will bring.

IT for Change's Comments:

The document should explain in further detail the learnings from these past initiatives.

Table 4.3: Descriptions of the major ICT initiatives in School Education in India

Programmes	Descriptions
IT Policy	An Act to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involve the use of alternatives to paper-based methods of communication and storage of information, to facilitate electronic filing of documents. Most of the states have an computer education component built-in as part of the State IT policy.
SSA/ CAL	Sarva Shiksha Abhiyan (SSA) is Government of India's flagship programme for achievement of Universalization of Elementary Education (UEE) in a time bound manner. Computer aided Learning (CAL) remarkable computer presence in the district visited, even in the remote schools. Another initiative in the form of mobile computer lab has been taken by the district administration in the district visited. A van has been fitted with four computers, one projector and a screen. The unit travels to all such schools which still do not have a computer. In the evening, the same unit runs programmes on adult education.
CLASS	Universalisation of computer literacy would percolate to students in small towns and the subordinate divisions of a district in India. The scheme has four main components such as partnership with state governments and union territories for providing computer-aided education to secondary and higher secondary government schools; establishment of two self-monitoring analysis and reporting technology (SMART) schools in each state which would be technology demonstrators; universalisation of computer literacy through the network of Kendriya Vidyalayas and Navodaya Vidyalaya Samiti to incorporate computer literacy to 10 neighbouring schools; and financial assistance to State Institutes of Educational Technologies under the project mode so that they become self-sufficient. HRD officials feel that the new scheme would enable pupils to acquire necessary skills required for both higher education and employment.
Digital Library	Digital Library projects in India are digitizing all the significant literary, artistic, and scientific works and making them freely available, in every corner of the world, for education, study and appreciation. In india, major agencies who are running these programs in schools are CDAC, RoomToRead Foundation, British

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Programmes	Descriptions
	Council, etc.
EDUSAT	EDUSAT is the first Indian satellite built exclusively for serving the educational sector. It is mainly intended to meet the demand for an interactive satellite based distance education system for the country. It strongly reflects India's commitment to use space technology for national development, especially for the development of the population in remote and rural locations.
State Institute of Educational Technology (SIET) District Information System for Education (DISE)	State Institute of Educational Technology (SIET) Project has been made responsible for the planning, research, production and evaluation of educational softwares like video, audio programmes and computer multimedia. With a major emphasis on user orientation in the use of educational and allied data for planning, management, monitoring and feedback on the DPEP interventions.
National Task Force on Information Technology and Software Development	Made specific recommendations on introduction of IT in the education sector including schools. The Report recommended provision of computer systems to all educational Institutions up to Higher Secondary/ Secondary Schools by suitable investments.

IT for Change's Comments:

These are all 'smart' projects, but they are based on a narrow view of the potentialities of ICTs.

SECTION 5. DEFINITION OF ICT

ICTs stand for Information and Communication Technologies and are defined, as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.” These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. **(UNDP, 2000)**

The term, information and communication technologies (ICT) refers to forms of technologies that are used to create, store, share or transmit, exchange information. This broad definition of ICT includes such technologies as: radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail. **(UNESCO 2002)**

Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication

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Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellar, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation. **(WORLD BANK 2002)**

In this document, the term ICTs refer to all the technologies used for handling and communication of information in School Education.

IT for Change's Comments:

The definitions for ICTs must also include those by educationists and those that reflect the progressive vision of other countries with ICT in education policies. The definitions must reflect the role of ICTs as a social tool beyond a simple bundle of hardware, software, radio, and other physical components. Further, it should consider definitions of ICTs that are embedded within educational contexts rather than understanding ICTs in a general sense and applying it to a school setting.

SECTION 6. GOALS

- ICT literacy for all, including ICT as a tool for basic literacy
- Ubiquitous ICT-enabled schools, for ICT-aided teaching and learning environment, and for administrative purposes
- Every school teacher to be ICT literate

IT for Change's Comments:

These goals only look at the most narrow version of ICTs and yet are too broad to be meaningful. What is meant by ICT literacy and is this necessarily a part of school education? If yes, then why is it that ICT use in education is only really being included from secondary education instead of from class I? The draft policy should get into this level of clarity. The meaning of ICT-enabled schools is also ambiguous – does it mean a personal computer for each learner and teacher? The goals must also address other aspects of ICTs, including their network building capacity, their contribution to constructivism, and their ability to develop a local-global curriculum.

SECTION 7: OBJECTIVES AND TARGETS

IT for Change's Comments:

The objectives and targets should be specific and clearly rationalised, explaining the basis for the targets that are being set. The pedagogical implications of these objectives need to be ascertained. Additionally, since the goals themselves are narrow and inadequate, the specific objectives listed below for each of the goals are somewhat irrelevant to discuss in too much detail, before a reformation of the goals themselves occurs. Finally, in the objectives and targets, ICT in School Education has been translated into computers in schools, without including uses of radio, TV, radio, and other ICTs. Computers in primary schools need to be intensively studied from a pedagogic perspective and then prescribed by policy. The relative gains vis-à-

vis alternative investments on drinking water, furniture, libraries, etc. also need to be clearly discussed.

7.1 ICT literacy for all

- Every child leaving high school will be ICT literate

IT for Change's Comments:

The definition of ICT literacy is ambiguous. Does it refer to the ability to use office automation packages (proprietary), to write software programs, to assemble hardware, or to design applications and hardware?

- Every child will be introduced to the basics of computers by class VI onwards. Targeted achievements of computer literate students will be attained at least 25% by 2012, 50% by 2015, 100% by 2017.

IT for Change's Comments:

'Basics of computers' is not an simplistic term. Herein lie choices for software, for applications and for hardware. Also, since we have discounted the vision of ICTs in education for a global workforce, the literacy form of ICTs becomes restrictive. The draft policy needs to include a more holistic appropriation and constructivist avenues for ICT integration in the school education policy

7.2 Ubiquitous ICT-enabled schools by 2012

- All high schools will have basic ICT infrastructure installed by 2012. Basic ICT infrastructure is defined in Annexure I.
- Initial lab based infrastructure will be finally replaced by ICT enabled/ supported classrooms for more effective delivery of lessons.
- All high schools will be connected to Internet by 2012.
- Each school will have a component of ICT integrated in the over-all development plan of schools

IT for Change's Comments:

The meaning of ubiquitous ICT-enabled schools is unclear, as are the processes and pedagogic principles underlying such prioritisation and timelines. The policy needs to mention and acknowledge the learner-centric, teacher-centric, collective-centric visions of pedagogy and discuss the rationale for high school connectivity but not middle and elementary school connectivity. The objectives need to define what is meant by 'basic ICT infrastructure', 'ICT enabled/supported classrooms' and 'component of ICT'.

7.3 Empower school teachers with ICT tools

- All teachers in high school will be trained in the use of ICTs for teaching/ learning/ assessment.
- All teachers will move from a teacher-centric to learner-centric education system, where the teacher would act as a facilitator.

IT for Change's Comments:

Teachers should first of all be involved in the design of learning and assessment systems, whether they are ICT-based or not. And this involvement should be open and collaborative across schools and thematic areas. Thus, the draft policy should spell out the details of teacher training, from the ability to use office automation packages as Project Shiksha does to a deeper construction of knowledge by working on software code and hardware components.

The pedagogic implications of moving from a teacher-centric to learner-centric education are highly problematic and controversial. Relegating teachers to the role of facilitator overlooks their critical role in education.

Free Software Foundation's Comments:

The hype of student-centred education should not neglect the responsible role the teacher must play in the process of education. Ironically, in the delivery of student-centred transaction, the burden lies in the enlightened teacher. Because, the burden to implement a student centered curriculum lies mostly in the hands of a teacher, since facilitating construction in the class room context is more challenging, and we need more talented, rather enlightened, teachers for implementing this process.

SECTION 8. THEMATIC/STRATEGIC OBJECTIVES

8.1 Infrastructure

8.1.1 Connectivity

Each student will have access to ICT-based learning technology. The State education departments will develop a long-term plan and strategy for providing connectivity to Internet in all schools by 2012. Each school will act as an information hub for community access to education.

IT for Change's Comments:

The potential of the school becoming the ICT hub of the community has various positive implications that have not been recognised in this document – it means community appropriation, community monitoring of the school systems, and the avoidance of an entrepreneurial model at all levels. However, the document must address how the provision of Internet means the school will become the information hub for the community and whether access is sufficient for the community.

8.1.2 Electricity

Priority will be given to provide power supply to all secondary schools to equip those to use ICTs in teaching and learning. There should be endeavours to secure alternate sources of electricity/renewable energy to meet power requirements.

8.1.3 School ICT Infrastructure

Each school will be equipped with ICT-enabled classrooms. An ICT room will also be designed for students to experience self-learning. The ICT tools and

equipments will be integrated in the school ICT plan keeping in mind affordability and sustainability factors of the school.

IT for Change's Comments:

The presence of a computer, connectivity and a DVD player perhaps, means nothing. The infrastructure needs to be driven and supported by a corresponding vibrant ecology of teacher and learner appropriation. There is no mention of this ecology in other sections of the document, which leaves the infrastructure section incomplete.

***Norms and Standards for ICT Hardware, Software and Connectivity in Schools**

8.1.4 School as an Information-hub

a. The States should enhance the ability of the School Education system to share resources and increase access to learning opportunities and information by all. Schools will act as information and learning centre, equipped to use video, radio and TV-based resources for teaching and learning.

b. Community libraries will be established with a digital repository of educational materials along with books. States will work with NGOs as partners to provide education facilities to out-of-school youth through these community libraries and school as an information hub as a whole. Thus, the school infrastructure will be accessible to communities, which can also ensure sustainability of ICT infrastructure so created in schools.

IT for Change's Comments:

The document should explain how sustainability is defined and why it is being invoked in this particular section.

c. There are other e-governance initiatives such as Village Knowledge Centers (VKCs) and Community Service Centres (CSCs) that can be integrated with the schools, to act as Knowledge Centers, designed to empower rural learners with new knowledge and skills through a dual approach for ICT literacy and ICT as the mode of education delivery. Village kiosks can also be set up near the school premises to avail connectivity and ICT infrastructure.

IT for Change's Comments:

It is important to note that VKC and CSCs run on an entrepreneurial model, and that schooling operates on a public goods model. This means that the easy marriage of the two models, as is proposed above, is not a likely future without upsetting the principles of one or the other.

8.1.5 Ownership and sustainability

Each State will institute an ICT cell within the State Education Department for planning, implementation and evaluation of ICT in Education plans and programmes in schools. Their responsibilities include laying down norms and standards for ICT infrastructure for hardware, software and digital content, alongwith regular revision and updating once in every three years to keep pace with the technology advancement and to incorporate dynamic changes. An annual

e-readiness survey of schools will be carried out by each State to evaluate the impact of policy intervention.

IT for Change's Comments:

There need to be some directives from the Central government plan as to what are the possible standards that need to be adopted. These directives can be developed by looking at the work done in states like Kerala.

It is unclear why this section is titled ownership and sustainability, while neither is mentioned in the subsequent text. What must be sustainable should be explicitly clear. Ownership should be regional and community-based. It is important to lay out clearly who will constitute the proposed ICT cell – it cannot be technical experts or private providers alone. Educationists must form the core of this Cell, to ensure adequate representation of educational goals. Representative inputs from communities themselves should be factored into the running of this Cell. The Cell can also link directly with smaller scale regional and local ownership structures to cover all schools.

Free Software Foundation's Comments

The policy document deliberately does not mention the massively successful collaboratively controlled projects like Wikipedia, Creative Commons, and of course, the Free software movement. The key enabler of this process is the copyleft, which describes the practice of using copyright law to remove restrictions on distributing copies and modified versions of a work for others and requiring that the same freedoms be preserved in modified versions. Any policy that does not make a mention of this will continue to waste time in describing general altruistic objectives without mentioning the specific operational facilitator.

Unless we use such an operationally feasible legislation, the alternative society of where control is with the commons is not possible.

8.2: ICT Content Development and Delivery

8.2.1 Quality digital content for students and teachers

The States will provide quality digital content to all learners and educators to support a range of learning activities in schools. The content will aim at providing ICT literacy for students in schools and teachers in teacher training programmes.

The content should focus on making conceptual learning of school subjects, such as Science and Mathematics, more interesting specially addressing hard-spot topics.

IT for Change's Comments:

There needs to be a clear outline and mandate of where the State will procure and distribute this content from, keeping in mind the budgetary and development trade-offs.

The concept of 'hard spot' topics is interesting, but needs to be explained and substantiated

8.2.2 Digital content standards

Quality benchmarks and standards on digital content will be developed by a designated nodal agency. Every State will aim to meet the prescribed national standards on digital content developed for students and teachers separately. The States will identify the best digital content available for schools. It will develop a quality assurance framework to ensure that all digital content is reliable. All the content developed for school students should be based on the prescribed syllabus laid down by the States.

The states will develop a framework for managing copyrights and authenticity of content.

Publicly funded digital content will be accessible free of cost or at/below the dissemination cost. an effort should be made to prevent lock-in, resulting from softwares' or developers' copyright issues.

IT for Change's Comments:

Several items in this section require clarification, including specification of the 'designated nodal agency' that will develop the standards. Furthermore, the draft policy must justify why a top down approach for determining the best digital content and a quality assurance framework is the most appropriate or ensure the inclusion of schools and educationists in this process.

Issues of standards are extremely important and the draft policy should not assume that all content to be used must necessarily be copyrighted as there are various other options for content. The document needs to explain clearly what this implies in terms of procurement of software and digital content. While it discusses copy right issues and the effort that should be made to prevent lock, the draft policy document never takes up the issue of open source.

8.2.3 Content in medium of instruction

A large number of students are learning in regional medium of instruction. Each State will make content available in the medium of instruction followed in the State.

IT for Change's Comments:

Such content may not currently exist. The draft policy needs to indicate possibilities for creation of such content in a bottom-up, collaborative manner.

8.2.4 Promote local content

The content available to the schools should address the specific needs of the schools, both in rural and urban locations. in terms of local and low-cost content that is designed or adapted locally by making an appropriate choice of ICT content/medium. Community access points such as public kiosks should be made available to access local content.

IT for Change's Comments:

Access should be free and open. No entrepreneurial models can be placed on top of this.

8.2.5 Digital content for self-learning

The digital content provided to schools should be designed to ensure students' interaction with technology and promote self-learning . The content should support a graded approach to cater to the needs of students from different classes.

IT for Change's Comments:

Self-learning is not a panacea. Teacher facilitation and teacher appropriation of digital content and ICT-based interventions need to be at the core of any ICT in education policy.

8.2.6 Digital content for blended learning

Digital content should be creative and support a blended learning approach, and not be mere digitisation of textbooks.

IT for Change's Comments:

An explanation must be given for what constitutes a 'blended learning approach'.

8.2.7 Digital content for teacher training

Digital content for teacher training curriculum will empower them to use technology in pedagogy. The content development will be based on instructional design. ICTs are not to replace teachers but to empower them with tools for effective teaching and learning. The teachers are to play the role of the facilitator and enjoy the experience of using ICTs in the school/classroom/lesson delivery/self-learning.

IT for Change's Comments:

The meaning of content development based on 'instructional design' is unclear.

As mentioned previously, the relegation of teachers into the role of facilitators of education has problematic pedagogic implications for the centrality of teachers to the educational process and the dangerous potential of phasing in ICTs as a teacher replacement.

8.2.8 Digital Repositories

Digital content is developed/acquired to share and adapt for multiple purposes. Online digital repository of content will provide universal access to learning resources and services for continuous improvement in curriculum practice, in classroom and distance learning settings.

The State Education Departments will develop cost-effective systems for schools to access online resources with in-built systems for upgradation according to the national/state curriculum modifications. The States will encourage innovative methods to create offline Intranet content available in local repositories – where Internet connectivity is not reliable or unavailable.

IT for Change's Comments:

Language differences also need to be factored in here, and the technical expertise needed for digitising of content and sharing does not happen by uploading content

onto the Internet. True sharing involves an actual offline collaborative component, which is lacking in the discussion above.

8.2.9 Digital content for Project-based Learning: The digital content should encourage project-based learning. ICT projects will be included as part of the school curriculum in all subjects.

8.3 Capacity Building

Every teacher will be capacitated to use ICTs effectively in classrooms . ICTs will be integrated in the teacher-training curriculum, which will empower them to prepare today’s students for tomorrow's workforce and for lifelong learning. Training will also be provided to school principals, ICT coordinators and school administrative staff to ensure a technologically sound school environment.

8.3.1 ICTs in Teacher Training-Pre-service and In-service

ICTs in teacher training will be integrated both in pre-service and in-service courses and programmes and pervade through all institutions involved in teacher training. In all pre-service teacher-training programmes, there will be a compulsory subject on ICTs to enable all teachers to use technology confidently to create, organise, communicate, and apply knowledge.

Regular in-service training for teachers and refresher course for education sector personnel on effective use of ICT tools will be mandatory.

The online teacher training courses for pre-service and in-service should be developed by a Government appointed nodal agency. The license and distribution of online course materials will be made available to educational institutes at all levels. An online assessment system along with certification of proficiency levels in ICTs should be developed as part of Teacher Training.

8.3.2 Capacity building for Vocational Education and Training (VET)

Professional training of all teachers and trainers, focused on implementation of ICT based teaching-learning practices in VET, will be organized.

8.3.3 Capacity building of School Principals in ICTs

The States will see to building capacity of school principals in ICTs as pivotal leaders to ensure educationally sound, well-planned and sustainable ICT-integration plans.

IT for Change's Comments:

Capacity building should not only focus on ability to make sustainable ICT-integration plans.

8.3.4 ICT competency areas

Use of ICTs to improve capacity building is planned for ICTs competencies of teachers in the following four areas:

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NATIONAL POLICY ON ICT IN SCHOOL EDUCATION

a. ICT Literacy: It is about using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society. This is an awareness stage in which teachers and staff become 'ICT literate' with regard to availability of a particular technology and its usability. Elementary concepts of ICT, using computers and managing files, word processing, spreadsheets, databases, creating presentations, finding information with the help of computers will be incorporated in the training for basic ICT literacy. It also includes training on troubleshooting, repair and maintenance of equipments.

b. ICT in pedagogy: It focuses on teachers' instructional practices and knowledge of the ICT curriculum. Teachers will develop ICT applications within their subject disciplines and syllabus for effective delivery of lesson.

IT for Change's Comments:

ICT in pedagogy is NOT only about 'developing ICT applications for effective delivery of lessons' but also about creation of curricular inputs, constructivist strategies, and open networks

c. Project-based Learning: As teachers become more familiar and confident with ICTs, they will begin to integrate subject areas and tools to work on project-based learning across subject areas.

d. ICT as an elective subject (Specialisation): ICT as a senior secondary level elective subject will introduce diverse ICT related subjects in addition to IT/Computer education, such as web designing, engineering drawings, media tools and handling, etc. to develop entrepreneurial skills in workforce.

***ICT Competency Standards for Teachers**

8.3.5 Alternate modes of Capacity Building

Each village will have a school-based Telecentre with computers and Internet connectivity to act as teacher professional development centre. Radio and television will be used for teacher training. Virtual Resource Centres can be also used for in-service teachers to avail training facilities via video-conferencing.

8.3.6 ICT Lab Assistant

Each school will have an ICT Lab Assistant, to assist teachers to use and maintain ICT tools/equipment. He/she will be trained up to a certain proficiency level required to use ICTs in subject teaching and to maintain equipment.

8.3.7 Neighbourhood Schools Network

Different schools are at various levels of ICT-readiness. Networking of schools will be promoted, wherein the schools will build knowledge sharing partnerships with each other to support the comparatively lesser-abled schools.

IT for Change's Comments:

The draft policy should clarify the processes by which schools will be identified as more- or lesser-abled.

8.4 Innovations And Research

8.4.1 Innovative use of ICTs in Schools

There is a need for innovations in delivery of education using ICTs, for increased effectiveness in pedagogy and cost at all levels. The States will encourage and promote the innovative use of ICTs for improved learning and teaching. States will promote research on ICTs in education to focus on improving prevalent technologies and developing new indigenous ones.

8.4.2 In the context of ICT and education, innovation is not only about technology but also about understanding untapped user needs. By innovation, it is meant, schools, teachers or support agencies creatively adapt technologies for effective application of available technology and access resources, where such innovations are adaptable and scalable.

8.4.3 ICT in Education Innovation Portal

A typical innovation ecosystem provides linkages among the various stakeholders including firms and entrepreneurs, government, educational and research institutions. These linkages encourage collaboration for idea generation and transformation of ideas into a business outcome.

Each State should have an online repository hosted to highlight and encourage research and innovation on use of technology in education sector and to promote localised and cost-effective solutions which maximise effective use of ICT in education and training in the state and regional context. The portal will identify, document and disseminate ICT in education innovations, acknowledge and reward local innovations.

8.4.4 National ICT in Education Excellence Awards

Each year National ICT Excellence Awards will be announced to identify and celebrate the best practices in ICTs in schools demonstrated by students/teachers/schools.

SECTION 9: SCHOOL INFORMATION MANAGEMENT SYSTEM

9.1 The present day education requires a professional, streamlined and effective administration. ICTs should intrigue new efficiencies and an increased capacity to utilise data in schools.

9.2 School ICT Plan

ICTs play a major role in improving the efficiency and effectiveness of school information management and administration systems. Schools will have a comprehensive long-term plan for the use of ICTs to establish a holistic, planned and sustained ICT integration program with quality technical support.

Each school will have an ICT School Plan integrated in the over-all school development plan. The schools will also have an ICT implementation strategy for hardware, connectivity, software, technical support and digital resource materials.

Use of GIS for planning of new schools in districts should be encouraged.
The schools will hire trained data entry operators to collect and feed data.

9.3 School Digital Repository

- Each school will maintain all information of the school in a centralized database.
- Each school will have its own portal featuring all school related information to allow access to each stakeholder (principal, teachers, students, parents, staff) from anywhere, anytime.
- The digital repository will consist of syllabus, curriculum-related courseware, digital library linked to various classes will also be available for students and teachers.

SECTION 10: PUBLIC PRIVATE PARTNERSHIPS (PPP)

10.1 Public Private Partnership to leverage economies of scale: PPP will be encouraged at all levels of ICT in education delivery mechanism to provide quality education to all by leveraging economies of scale through channelisation of the social responsibilities of private companies in the education sector. PPP is fundamental to the integration ICT in education sector, as it will create an ecosystem for private sector to work with government and development organisations to extend the benefits of technologies to schools.

10.2 Roles and Responsibilities in PPP

The PPP should clearly indicate the roles, responsibilities and well-defined accountability procedures of the partners. There should be a built-in monitoring and evaluation component in the PPP based on schools' feedback.

The partnerships will ensure that the latest advancements in information technology reach all schools, as the private sector would act as service providers by combining their assets and skills to accelerate the benefits of ICT in education delivery. The partners will be encouraged to emphasise on education of girls, women, and the less privileged. PPP will be encouraged in providing ICT infrastructure, implementing latest technologies in classrooms, developing and distributing digital content and skills training at school level to improve the quality of education.

10.3 PPP for Vocational Education

Participation of private sector and NGOs will be encouraged in improving ICT facilities and resources of vocational education technology (more information available in Section 14: ICT in Vocational Education).

IT for Change's Comments:

The extent of private sector and civil society involvement must be made clear in

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NATIONAL POLICY ON ICT IN SCHOOL EDUCATION

the draft policy. It must explain why PPPs are fundamental to the integration of ICTs and how working with the private sector will create an ecosystem where the critical aims of education are met. This description must also explain how PPPs will leverage economies of scale to the benefit of education, which cannot be thought of as a marketplace for learning-related goods and services but needs to be conceptualised as a public good. The section needs to be reconsidered and supported with evidence, perhaps of benefits that PPPs in the education sector have provided in other countries.

Free Software Foundation's Comments:

Currently the information infrastructure is laid with the help of PPP, by explicitly and legally preventing the formation of community-controlled ICT infrastructure. Governments and private industries should not be together controlling distribution, e.g. of the electromagnetic spectrum, and collecting revenue on an eminently available resource, like spectrum.

In contrast to this mode, if the control is with the commons, the new alternative information infrastructure will be peer-to-peer. The new technology eliminates the need for central control. The current state of the art of science and technology, is capable of self-regulatory infrastructure. We should work towards facilitating such a system.

Though the policy document talks about using all kinds of ICT for supporting education, it does not talk about what kind of ICT is desirable. The 'digital rights management' that governments are granting to industries may help the bigger multinational corporations encroach into the educational arena. The existing digital technology is already polluted by such technology. Therefore we do have to talk about the choice of ICT. We do need to define the character of the desirable ICT before we make an intervention.

SECTION 11: MONITORING AND EVALUATION (M&E)

11.1 Annual Survey in Schools

M&E process to be an integral component to keep the process up-to-date and incisive, ICT policies and practices to be reviewed and revised periodically. Every year a survey of e-readiness of all schools will be done. It will involve variable indicators of e-assessment and readiness of schools. The respective State Education Departments will institutionalise that survey under the ICT cell.

11.2 Educational Management Information System (EMIS) of schools

The EMIS of schools will measure the impact of ICT intervention annually on a number of educational indicators like enrolment, gross enrolment ratio, net enrolment ratio, retention rate, dropout rate, completion rate, repetition rate, transition rate, etc. The EMIS will reflect the impact of ICTs on overall achievement levels of schools and students.

11.3 Monitoring Mechanism and Agency

A three tier monitoring mechanism will be followed, ie first at an internal or school level, external (agency allotted), annual EMIS School level, State Level

and National Level monitoring required., institutions of proven excellence will be involved in monitoring at all stages to encourage independent evaluation.

IT for Change's Comments:

The draft policy must acknowledge and address the limitations of monitoring and evaluation, particularly of the problems of expecting immediate results since the nature of the benefits of ICTs, which have network effects that appear only after subsequent generations. Other problems may result from the insufficiencies of numerical indicators – how do you measure learning, confidence, collaboration, etc. in ways that do not result in 'teaching towards the test'.

The monitoring and evaluation section also makes no mention of whether the results will be made available to schools and teachers and the community or how the information will be used once collected.

SECTION 12: FINANCING

12.1 ICT integration at all levels in the education sector is a capital-intensive process. Sound management and financing of ICTs in education policy are necessary conditions for the effective integration of ICTs in schools. Financial management for (ICTs) includes improved teaching and learning investments for skill development of learners, teachers, support staff and leaders, educational content and school administration investments on technical infrastructure.

12.2 Special Budget Allocations

To facilitate annual budgetary provisions for ICT-in-education activities for children with special needs, girl education and socially disadvantaged and out-of-school learners. Computer recycling and refurbishment should be encouraged by the States through financial incentives.

12.3 ICT Infrastructure

To ensure the site readiness of all schools, there must be an initial financial investment by the government at the national level, especially in basic ICT infrastructure and resources.¹ Consideration must therefore be given to implementing a maintenance strategy that can prolong the life span of the computer equipment installed in schools and minimize any additional cost associated with the malfunctioning of equipment.

12.4 Sustainability

Encourage the formation of school ICT leadership for financial planning and implementation plans in schools. Schools are provided with basic technological infrastructures and are given the autonomy to decide on the kind of ICT resources and tools that they should acquire, based on their own visions and analyses of their students' learning needs. Each school should have an ICT procurement plan as part of the school overall budget. Feasibility studies should be conducted for cost-effective ICT interventions in schools.

IT for Change's Comments:

ICT financing needs to ensure that all aspects ICTs are integrated into education rather than simply translating the need for ICTs in school to buying more computer, which will not adequately address the aims of education, as discussed previously.

The draft policy should discuss how initial ICT infrastructure in schools will correspond to ICT infrastructure outside the education sector, including how ICTs in education will be constrained by lack of general ICT infrastructure or will create pressure to build ICT infrastructure.

SECTION 13: NORMS AND STANDARDS

13.1 The policy recognises the need for agreed standards for ICT infrastructure, equipment (hardware and software), content development and capacity building, to deliver effective education through ICTs.

13.2 The ICT in School Education Steering Committee will develop and maintain a list of standards. The Committee will ensure the selected standards allow for reasonable interoperability (open standards), diversity, vendor independence, functionality, and value for the education community. The Committee will recommend changes to the standards, which must be endorsed by the Policy Executives to officially become a policy. Specifically the standards policy should include, Hardware Platforms, Operating Systems, Software, Database, Network Infrastructure, Management Systems, Software required for the national curriculum and digital repositories, Audio Visual resources and Archiving etc. All donations and private/civil partnerships will be expected to follow the standards.

IT for Change's Comments:

The document must explain the constraints that prevent full (instead of reasonable) interoperability, diversity, vendor independence, etc. This section is also the first to introduce the idea of the School Education Steering Committee, but it does not describe who is part of this committee, what its accountability structures are, and what is the decision-making power vested with this committee.

Free Software Foundation's Comments

The digital knowledge society, as opposed to the traditional knowledge society, needs an additional legislative guarantee of the right to decode (interpret) and re-encode. Free Software Foundation's General Public License (GPL) is an example of how this can be operationalized. An important practical issue that should find a prominent statement in the policy document is the need to adhere to free/open encoding standards.

The document talks of only standards, but every standard (such as an ISO standard) does not guarantee the freedom to decode and re-encode. Simply put, ISO standard does not mean that it is an open standard.

If free document standards are not used for ICT in education, there is danger of encapsulating commons knowledge in proprietary 'standards'. In the current scenario, de-codable rights of the most of the e-educational resources are with Adobe and Microsoft. The whole society is paying them to interpret our own documents.

SECTION 14: ICT IN VOCATIONAL EDUCATION

14.1 ICT as a tool and as a vocational subject will play a major role leveraging the delivery of vocational training and skills to school students. To improve occupational skills and technical knowledge enhance individual employability; reduce the mismatch between demand and supply of skilled manpower.

14.2 Vocational Education and Training (VET) in Schools

Secondary and Higher Secondary Education are important terminal stages in the system of general education. At this stage, the youth decide whether to pursue education, opt for technical training or join the workforce. Vocational Education and Training should be promoted through both formal and non-formal education system. Access, through Open and Distance Learning (ODL) mode will be enhanced along with Educational Satellite (EDUSAT) for popularization of VET programmes. The option of providing vocational training through the Internet will also be explored for development of multi-skills and regular updation with technology advancement.

14.3 The States will introduce ICTs in the secondary and higher secondary schools as optional vocational subjects to simulate work atmosphere. ICT as a mode of subject delivery is aimed as a remedial measure to tackle shortage of teachers in Vocational education and improve the quality of education delivery. Intensive teacher training should be conducted for teachers teaching vocational subjects.

IT for Change's Comments:

ICTs cannot simply be positioned as such, that is as remedial measure and a replacement for personal guidance of teachers. This is especially so in vocational training, which is more practical and less theoretical.

14.4 The subject delivery will provide modular learning opportunities, and be practical oriented. Virtual labs will be set up with public private partnerships for computerized vocational training. Strategies for encouraging access to Vocational Education and Training (VET) for marginalized groups, including SCs, STs, OBCs, Minorities, girls, street children, working children and differently-abled children, will be adopted.

14.5 The policy will encourage digital content design and production of a wide range of vocational training courses for all levels with a special focus on higher secondary levels.

14.6 ICT Learning Resource Centres (LRCs)

The existing secondary schools will act as extension centers for ICT vocational courses. Schools will be equipped with Learning Resource Centres (LRC). This resource room could be used for vocational education purposes by the school in post-school hours. It should be equipped with a library and ICT infrastructure and connectivity with a Vocational Education teacher-in-charge.

SECTION 15: OPEN AND DISTANCE EDUCATION

15.1 States will promote open and distance learning using ICTs for education delivery for expanding access to primary and secondary education through open schools.

15.2 Educational councils and boards will promote use of online learning tools, CD modules, EDUSAT facilities to augment the reach of educational opportunities in dispersed locations where conventional schools are not viable. It will provide a choice to learners of what, when and where they want to learn. ICTs in open and distance learning through National Institute of Schooling will ensure a safety net to school dropouts to continue their education and offer a choice for continuing education to those who want to combine work with learning.

Online education and blended learning will form an integral part of open and distance learning.

15.3 Online Registration: An online registration system will be adopted by NIOS and State agencies for open schooling.

SECTION 16: ICT FOR SPECIAL NEEDS

IT for Change's Comments:

The section on ICT for special needs may propose ways to bring ICTs to socially disadvantaged groups, but its focus on access ignores the other important aspects of ICTs. The draft policy does nothing to address the structures that result in these inequalities in the first place. While training women teachers or providing mobile computer vans may seem like plausible solutions to providing access to the benefits of ICTs, such provisions are useless if cultural restraints prevent these disadvantaged groups from taking up these technologies even when they do become available. Furthermore, access will only go a short way in addressing 'special needs' without formation of relevant content that aims to meet the needs.

16.1 The policy will encourage use ICTs to engage 'hard to reach' learners, with special needs support, more motivating ways of learning, and more choice of how and where to learn. ICTs will provide them a medium for education.

The States will introduce ICTs as a medium and a powerful tool to support inclusive practices to address issues like under-achievement and educational exclusion.

16.2 Remote Areas: In India, there is large variation between States, districts and blocks with respect to educational infrastructure and outcomes. ICTs as a tool can be used to address the issues of accessibility and connectivity as these areas need special attention. ICT school programmes should be given priority in the geographically difficult and remote areas. Mobile computers vans with ICT Infrastructure can be a good resource for these children.

16.3 Disadvantaged Groups

SC and ST children, children belonging to religious, linguistic and ethnic minorities and girls, who have lagged behind in education will be dealt with special focus and strategies both in education planning and implementation.

16.4 ICTs for addressing disabilities

ICTs can be instrumental in providing alternative ways of learning, the basic elements of School Education and developing life skills for increasing employment opportunities with the supporting softwares and multimedia. The policy will urge the States to use Open and Distance education and e-learning tools for the physically challenged learners to provide a customized pace of learning.

IT for Change's Comments:

ICTs for addressing disabilities is not just the provision of specialised tools but also about setting standards that allow for a more mainstream involvement of differently-abled groups. See Dipendra Minocha's extensive contributions to the 'National Policy on ICTs in School Education' and involvement in this regard.

16.5 ICT for girl education

While planning for ICTs in School Education, due attention will be given for greater access and use of ICT facilities by girls. Convenient time should be allocated for access and has to be formalised under the existing NPEGEL / KGBV schemes to facilitate inclusion of girls in ICT interventions and programmes in schools. The schools will build a strategy to recruit more ICT-trained women teachers in schools to increase the pool of educated / trained women from specific areas / social groups.

ICT centres will be directed to provide facilities for girls to avail the services of the centre outside school hours.

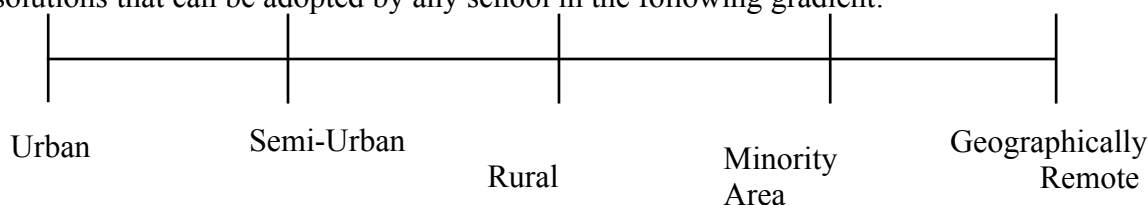
IT for Change's Comments:

The draft policy must discuss the funding and functionality mechanisms for these centres that will ensure the operationalisation of gender in the activities.

ANNEXURE I

Norms and Standards: ICT Infrastructure for Schools

The annexure aims to provide guidelines for ICT Infrastructure options and solutions that can be adopted by any school in the following gradient:



1. Computer Aided Learning:

- Computer-School Ratio: 10:1¹
- ICT room dimension: 10m x 7.5m²
- Connectivity:
 - Locally networked with modem – both CDMA and GSM
 - Wireless
 - School as a Telecentre
- UPS
- Printer
- Furniture
- Projector
- Photo Camera
- Video Camera

2. Computer Aided Instruction:

- TV (for satellite based program as well)
- PC to TV connection device

3. Satellite based Programs:

- IP ROT
- Antenna – Receiver terminal
- Digital Receiver with set top box

4. Radio Programs:

- Radio set
- Mobile device

5. Mobile Learning

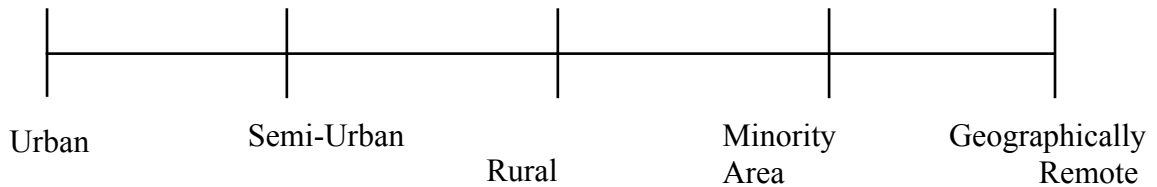
1 ICT@School Programme, MHRD

2 Draft report of working group on Secondary Education, MHRD

ANNEXURE II

Norms and Standards: e-Content for Schools

The annexure aims to provide guidelines for e-Content options and solutions that can be adopted by any school in the following gradient:



1. e-Content Design and Delivery

- Computer/Online content design and delivery
- Satellite content design and delivery
- Radio content design and delivery
- Mobile content design and delivery
- Other technology based content design and delivery

2. Procurement Criteria

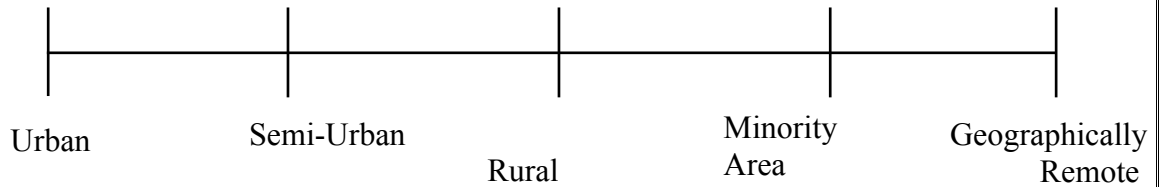
3. e-Content Quality Standards

4. Monitoring and Assessment Mechanism

ANNEXURE III

Norms and Standards: Capacity Building of Schools and Teachers

The annexure aims to provide guidelines for capacity building of schools and teachers to effectively use and adopt ICT in any school in the following gradient:



- 1. ICT standards for schools – eligibility criteria for affiliation/accreditation**
- 2. ICT competency standards for teachers**
- 3. ICT Literacy standards for students**
- 4. 4. Interoperability Standards**

ANNEXURE IV

*** Specifications of the BOO and BOOT models for the States to be developed for an implementation plan**