Optimum Information & Communication Technology Contribution to Learning and Education: Scenario of Delhi Education

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Background

Children are an asset to the nation, so to ensure bright future students should be groomed and moulded in such a manner that they are able to realize their potential and use it in best possible manner. School Education system is meant to provide students with knowledge skills and dispositions for self development and for contributing towards society. Education is the agency for intended change. The school is the place where intended education is imparted. Effective teaching learning process is the function of many variables which can be enumerated as school physio psychosocial learning environment, competencies' of teachers, instructional tools in the hands of teachers, technology with the teachers. In the contemporary global society, Information & Communication Technology (ICT) plays an important role in achieving the targets of progressive state. In the classroom situation ICT has enormous potential to make teaching learning process interesting, interactive, illustrative and participatory. ICT enhances outreach for qualitative education to all surmounting logistical difficulties.

KeyWords:- Information, Communication Technology,

The real strength of Information & Communication Technology lies in its ability to unlock learners learning through enhanced engagement, personalised education and equal access to all.

Scope of Education in Information & Communication Technology age:-

1. Education for creation of knowledge and spreading understanding.
2. The role of the teacher is to facilitate and guide.
3. Methodology of teaching and learningmust be participatory; activity oriented and project based.
4. Global Education in global classrooms to global students.
5. Coping with ICT embedded environment where
   o Pen changed toPendrive
   o Smart Student to smart classes
   o Marks to grade
   o Black Board to Smart Board

About Information & Communication Technology

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.

- **The vision of ICT:** National policy of ICT in the School Education aims at preparing youth to participate creatively in the establishment, substance and growth of a knowledge society leading to all round socio economic development of the nation and global competiveness.

- **Vision can be achieve**

1. To create an environment of cooperation and sharing among all stake holders.
2. To develop good quality content and to enable student and teacher to be partner in development and critical use of shared digital resources.
3. To increase use of ICT has brought about a see change in the generation and transmission of knowledge. This will empower the learner for self paced learning.
4. To embed ICT as pedagogical tools for all areas of School Curriculum.
5. Professional development of teacher through various Capacity Building programme.
6. A teacher must be innovative, creative and keep updating her/himself.

In visualizing the role of Information & CommunicationTechnology,Delhi State has working on many aspects:

- **Infrastructure :**

Directorate of Education has 1019 schools in which under the National policy of ICT in School Educationhas computer labequipped with 10 computer system with one server. There is also one projector , printer available in the computer Lab. Also Computer lab is different from CAL Lab.

- **Human Resource**

Delhi Government has recruit the 1738 TGT computer Science and PGT Computer Science recruitment is also in progress

- **Curriculum**

"ICT in Education" curriculum for Primary stage schools

Primary education is the largest sub-sector of any education system and offers the unique opportunity to contribute to the transformation of societies through education of the young. In order for young people to adjust to and compete in the rapidly changing environment of the contemporary world they need to have a set of life skills which includes among others, communication, analytical and problem-solving skills for creativity, flexibility, mobility and entrepreneurship. Thus an educational strategy should be oriented on the new lifestyle concept and corresponding skills development alongside technological innovations.

Analyzing the changes in the teaching and learning processes in primary education that are due to the integration of ICT is a real challenge: there are many different factors, strategies, and approaches, as well as positive and negative experiences to examine. Through our work we decided to support primary teachers by developing ICT in Education curriculum for Primary classes, in the schools of DoE.

In alignment with the national policy of ICT in school Education, SCERT Delhi is in the process of developing **"ICT in Education" Curriculum** for the holistic development of the 21st century learner based on the thematic learning model for the primary schools.

A thematic Learning Model has been followed for the development of the present curriculum; accordingly four themes have been categorized. These themes are: -

Wellness
Aim : To nurture a state of complete physical, mental, and social well-being.

Empowering LittleHand
Aim : To promote experiential learning through the method of building, modifying and recreation.

Digital Art
Aim : To stimulate imagination and promote out of the box thinking.

Buzzing Mind
Aim : To nurture logical reasoning skills with the help of educational games.

The themes of the curriculum are interconnected and cannot be seen in isolation as these themes respond to a 'process of education' in itself. In developing any curriculum, the nature of the target population must be kept in mind; in this case the target population is primary children, who are fluid,

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inquisitive, sensitive, creative individuals having immense potential. Through these interconnected subthemes, this curriculum aspires to explore inherent potential of each and every child.

The computer curriculum for each standard is broadly divided into three groups:

1. **Concepts:** Learning computer science concepts that are generally useful in many areas as well as some concepts that are specific to computer usage/functioning.

2. **Usage Skills:** Developing hands-on skill in the use of various hardware/software and programming packages/languages.

3. **Social Aspects:** Understanding ethical and security related issues of computer and Internet usage.

The emphasis is on understanding the concepts behind various computer-based activities, rather than just the usage skills of specific tools. It is hoped that such a concept-oriented approach will equip the children to be self-learners and enable them to cope with the inevitable advent of new tools and technologies of the future.

"ICT in Education" curriculum for classes 6th to 10th

SCERT had developed the curriculum on **"ICT in Education"** for Elementary & secondary stage schools of Delhi and was implemented in 2016 toprovide the framework for implementation of visions & goals of National policy of ICT in school education.

The **"ICT in Education"** programme for students aims to enable them to creatively interact with a wide variety of hardware, software applications, devices and tools, nurturing their inquisitiveness and imagination, enabling them to access a wide variety of information and resources and helping them to solve problems.

The main objective of the curriculum **"ICT in Education "**is to develop skills that will enable them to function as discerning students in an increasingly digital society and to access various tools & applications for learning and skill development opportunities.

Text Books: "SaralSugam ICT in Education" Text Books from class 6th to 8th

SCERT has developed the books for the classes 6th to 8th on "SaralSugamICT in Education" for the effective teaching-learning process.
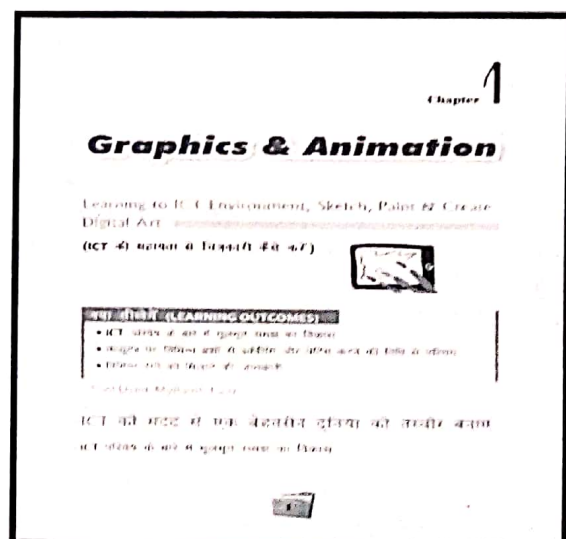
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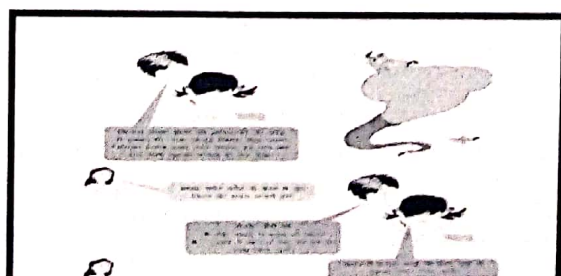
Education":

- The content is developed in the National Language HINDI to ensure a mass appeal making it easy to understand for one and all.
- The writing style is narrative. Different characters have been used that introduce concepts and take the learner through. The text is designed in the form of conversation between the characters to make it interesting and attractive for the students.
- The concept is outcome based. Every chapter has a set of learning outcomes which define the skills that a student will acquire on the completion of a chapter.
- Incidental learning is promoted by integrating ICT with regular academic subjects to enhance understanding of concepts thus in the process appreciating and mastering the usage if ICT tools.

The focus is on learner centric learning and thus promoting **"Learning through ICT"**. The student is not merely taught but guided in such a way that she/he learns by herself./himself while performing various activities, simultaneously nurturing the critical thinking, decision-making and problem solving life skills.

Other Programmes

Online Capacity Building Programme for Teachers of Delhi:Using Technology effectively to reach all teachers

State Council of Educational Research and Training, Delhi introduced an Online Capacity Building Programme (OCBP) to connect and equip the teachers posted at different locations in December 2016.

It complement the challenges of faceto face training which are pullingout teacher's for training from their school times, limitationsof comprehensive training over topic-wise intense training,timings of training not aligned to the time when the topic is taken in the class, limited pedagogicalsharing and collaboration among teachers, tracking analytics of training.

The aim of OCBP is to provide specific topic based pedagogical support to its teachers and build their capacity in effective classroom transaction.The trainings are mapped as per the annual academic calendar of schools.

The programmes have been prepared by faculty of SCERT and Mentor teachers with technical support from Million Spark foundation by focusing on In-class resources (How to plan & teach my next class?).The training is provided through web www.chalklit.in& app **"Chalklit"**. (Available on android &IoS platforms)

Around 8000 In-service teachers are being trained through OCBP.

Objectives of OCBP

- To enhance Teacher-to-Teacher and Teacher Educator- to-Teacher communication.
- To enable student-centered teaching approaches.
- To provide 24*7 accessibility to course materials.
- To build capacity of In-Service Teachers through online training for updating content knowledge as well as classroom delivery
- To connect teachers together in an online community to help them, raise their concerns and get solutions for the same.
- To provide teachers with all resources appropriate for different grades to conduct her/his classes efficiently, with better content knowledge and interesting methods of teaching as well as assessing learning outcome of students.
- To reduce "administrative work" around course management.

Key takeaways/learning:

Teachers may do their training at their own place and own pace with in the given time frame as per their comfort. Some of the take away of the OCBP are:

o 24*7 accessibility
o Self Paced
o Time Saving
o Anywhere , anytime capacity building
o Content specific pedagogical centred capacity building trainings
o A community of teachers to share their academic thoughts
o Easily accessible On Mobile Devices
o Easy Updating
o Easy to get instant records
o Easy to keep track
o Save paper and file work
o Customizable in nature

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o Easy To Setup And Can Scale To Thousands Of Users

o Easy to answer the queries of trainees by the trainer with their

o Evolution of larger online learning community

Road Ahead:

OCBP will be scaled up across the all school subjects for all school teachers across all grades and also in the Co-academic areas like Cyber Security, Action research etc.

Research support in OCBP

Research studies are taken to study the Effectiveness/ Pedagogical impacts of Online capacity building programme for In-service teachers who undergone the training and are expected to implement in their teaching learning processes.

Capacity Building Programme in Education Technology (CBPET)

SCERT provide the CBPETs for Teachers (In-service & Pre-service) and Faculty of SCERT / DIETs with the objective of seamless blending of ICT in their teaching & other academic tasks

Production of Educational Video Programme (EVP) to support the teaching learning process

SCERT has developed Educational video programmes every year under its project "Production of Educational Video Programme" (EVP).

■ This project envisages development of Educational video module lessons / programmes, across the spectrum of school Education at all levels.

■ The EVPs are very much interactive, involving students performing activities under the guidance of the teacher, deducing concepts and arriving at conclusions.

■ The EVP will be effectively demonstrating the constructivist pedagogy recommended by NCF 2005.

■ The EVP will integrate continuous evaluation of the students.

■ Videos on different content are used as a standard video module in In -Service capacity building programme by the resource person. Videos are very lively for teaching-learning process.

■ The video program will be very useful during the various capacitybuilding programme to fulfil the demand of teachers (newly promoted and recruited).

■ Best practices are shown as a model by the teacher and these EVPs upload on the SCERT website i.e.www.scertdelhi.nic.in for all stake holders.

Research support in Educational Video Program (EVP)

SCERT undertakes research projects as one is taken on "**A Study of Effectiveness of Educational Video Program (EVP) on Classroom Transaction for Students' Learning Achievement in Mathematics.**"The project envisages the effective use of educational standards-based videos in the teaching-learning process. The research in this area also advocates the use of e-TLM in teaching any content effectively and more appropriately as per the socio-psychological bases of learning. This study explored the theory and research support the educational use of educational standards-based videos and its implications for classroom practice.

Digitalization of Manuals/Reference material for universal access

SCERT has been developing manuals/reference material for the teachers of schools of Delhi for offline & online pedagogical and content support in the workshops/training programmes/seminars. SCERT materials are enriched withpedagogical & content support which are very useful not only for the teachers but also for the students, so digitalized materialsare available to everyone who needs them instantly, regardless of the users' physical locations worldwide. The e-pub documents can be restored quickly without loss.

The manuals and reference materials are made compatible across all technological platforms (App & web based) for the universal access.

SCERT has approximately 686manuals and reference materials out of which approximately 100 manuals are digitalized and available on national portal epathshala.nic.in/ EPATHSHALA App and also on SCERT website www.scertdelhi.nic.in and the remaining are in process for digitalization.

AnimalizingText Books forICT in Education

Keeping the zest of ICT which is characterized by imparting instructions for collaborative learning, inculcating multidisciplinary problem-solving skills and promoting critical and creative thinking patterns with the philosophy of learning with joy, SCERT is animalizing the textbooks for **ICT in Education.** The text books with title series **"SaralSugam ICT in Education"** for classes6th, 7th& 8thare developed for the schools of Delhi.

The format of books contains the animated characters and pictorial story type activities to attract the attention of students to improve their learning. The text is designed in the form of conversation between the characters to make it interesting and attractive for the students. Animated characters/videos attract learners at every developmental stage and make permanent intended impressions in their process of learning.Hence, the animatizing the books is a brilliant and innovative way to encourage children to communicate stories, ideas and concepts in a narrative style of communication. **Toward this objective, SCERT is in process of converting the content of "SaralSugam ICT in Education" book into animated videos for the effective teaching-learning process.The e-content will be delivered through the App and Website both.**

Challenges and Issues

Challenges before the Education System

o Significant challenges that policymakers and **planners, educators, education administrators**, and other stakeholders need to consider include

- Educational policy and planning,
- Infrastructure,
- language and content,
- capacity building,
- Financing.
- Teacher Readiness for ICT Integration

The challenges faced by teachers in implementing an ET program include:

- Fear of technology (Limited understanding of hardware tools such as mouse, keyboard etc.)
- Teachers feel insecure that may be they over being replaced by technology, and as the classroom will become the learner centric they may be can lose their authority.
- General unwillingness
- Support from Officers
- Absence of Lab technicians as they are the keen part in accessing and maintaining the Lab
- Giving less importance to the ICT in Education Subject as compare to the other subjects
- Involvement of teachers in teaching other subjects and other IT related work

Conclusion

However the saying that **"behind every Technology, is a man who makes or mars it'** is true in the case of Education also. The success of classroom teaching, apart from Educational Technology, depends upon the behaviour/attitude of the teachers. For this purpose the teacher has to adopt the mechanism of interaction analysis, action research, simulated-teaching role playing and gaming, monitoring and evaluation system approach, teaching psychology, model teaching and cybernetics. Similarly individualised and group based system of education namely programmed learning, programmed instruction, computer assisted instructions are equally important and these areas are closely linked with Educational Technology.

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