

ICT FOR QUALITY OF EDUCATION IN INDIA

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Abstract:

Information and Communication Technology (ICT) can be utilized for the education sector. Education includes online, distance and part time education. There are unlimited applications of ICT in the real world. In his paper emphasis is on the education field. Traditional Non-formal education system process includes activities like admission, Personal Contact Programmes, Exam for any course in a University or Institution. In this process ICT can play a great role in all the activities by providing a lot of benefits to students, teachers, parents and Universities itself. ICT can be used for providing education to the people who are not able to come to school due to various constraints. ICT can play great role in formal and non formal forms of education. The paper examines certain important issues related with the effective implementation of ICTs in all levels of education and provides suggestions to address certain challenges that would help in the implementation of ICTs in education and simultaneously increasing Quality of education.

Keywords: ICT, IT, Education, MIS, Quality Education

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1. Introduction:

IT has become a buzzword while talking about technology and its applications. IT is used in various business and management functions but not in the improving the quality of education. Quality of education has been issue of concern in the absence of standard parameters of to measure the quality. The hardware, software, the methods and know how required or used in acquiring, storing, processing and displaying data and information is collectively known as Information Technology (IT). Also on other hand, many developments and achievements took place in communication technology sector after and Second World War. Hardware, know how, programs and the methods used in ensuring that message is transmitted correctly, efficiently and cost effectively are collectively known as Communication Technology (CT). Both of these technologies became complementary to each other means progress in one alone is not much beneficial. Hence IT and CT started moving together and a new term was coined named as Information and communication Technology (ICT). Convergence of these two technologies gave birth to ICT [2]. Education system includes formal and Non-formal forms of education at various levels of education. Teaching is imparting knowledge or skill whereas learning is skill acquisition and increased fluency. Usage of ICT is one of the way by which India's large population base can be effectively reached. Moreover in enhancing the quality and delivery of services through ICT-especially in case of developing relations with citizen- Government will be better positioned [16]. Passive learning occurs when students use their senses to take in information from a lecture, reading assignment, or audiovisual. Traditional lecture is not an effective learning environment for many of our students because so many students do not participate actively during a traditional lecture [23]. This is the mode of learning most commonly present in classrooms whereas active learning involves the student through participation and investment of energy in all three phases of the learning process (input, operations, and feedback). This type of learning is more apt to stimulate higher cognitive processes and critical thinking [13]. In the past few years there has been a paradigm shift in curriculum where teacher acts as a facilitator in a student centered learning. In Student centered learning focus is on the student's needs, abilities, interests, and learning styles with the teacher as a facilitator of learning. Here students have to be active responsible participants in learning process. Teacher has key role in the whole process whereas in case of ICT based education, various ICT tools are supplemented to make the teaching-learning process effective. With the help of blended learning, total time

devoted to teaching can be decreased [7]. A survey [13] says that there was a sense of pride created and interest generated among the teachers and students for gaining ICT and its privileges. ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. ICT as a tool can overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers [4]. In this paper how learning through ICT can be made effective and easier for improving the quality of both formal and non-formal forms of education. Section 2 explains ICT tools, section 3 explains ICT application for quality improvement in formal and Non-formal education, section 4 shows ICT for Content development section 5 shows ICT and teachers Training whereas section 6 shows certain challenges and their solution for the implementation of ICT in the education sector.

2. ICT TOOLS:

There are various ICT tools available which can be utilized for the knowledge creation and dissemination in the modern world. Tools include Radio, T.V, Internet, Mobile phone, Computer, laptop, tablets and many other hardware and software applications. Certain ICT tools like laptops, PCs, mobile phones, and PDAs have their own implication in Education. These devices can be used in imparting education and training for teachers and students. Many of the ICT tools are much hyped but have not given fruitful results till now. Use of radio for pedagogical practices has been very much popular in past and is still in use in India by IGNOU. But One-to-many broadcast technologies like radio and television are seen as less 'revolutionary' ICTs in education, as their usage is seen as reinforcing of traditional instructor-centric learning models, unlike computers, which many see as important tools in fostering more learner-centric instructional models [6]. Successful ICT initiatives meet three intertwined objectives: availability, access, and demand [10]. Educational ICT tools are not for making educators master ICT skills themselves, but for making educators create a more effective learning environment via ICT. Teachers can utilize ICT tools to get benefits from using these tools in the areas of content, curriculum, instruction, and assessment. ICTs include fixed-line telephony, mobile telephony, newspapers, radio, television, radio trunking, very small aperture terminal (VSAT), computer, and internet must be accessible to rural public as per their demand. School children using various ICT tools are shown in Figures 1.1 and 1.2 below.



Fig 1.1 school children using computer projector



Fig1.2 children seeing a video clip on projector

3. ICT application for quality improvement in formal and Non-formal education:

ICT applications are becoming indispensable parts of contemporary culture, spreading across the globe through traditional and vocational education. In Indian scenario, mainly education system has three tiers primary (including nursery and preprimary), High school or secondary level (High and senior secondary levels) and the college or higher level (including college, university levels). In all these levels of education ICT can be utilized for better teaching learning process and improving quality of education. Using multimedia in education results in the increasing productivity and retention rates, because people remember 20% of what they see, 40% of what they see and hear, but about 75% of what they see and hear and do simultaneously [5]. Interactive whiteboard helps teachers to structure their lessons, supports collaborative learning, can help to develop student's cognitive skills, enables ICT use to be more integrated into classroom. Government of India has announced 2010-2020 as decade of innovation. Reasoning and critical thinking skills are necessary for innovation [3]. Foundation of these skills can be laid only at primary level of education. Students who enter school are very curious, creative, and capable of learning many things. At this level, statement 'Picture is worth than thousand of words' is very much true in case of teaching –learning process. Befriending ICT in the initial stages of education will help young people come to terms with what lies ahead. Students

studying at this level take much interest in cartoons. They understand more through animated pictures. Hence if the same environment is created in schools by using ICT for teaching kids at primary level may bring drastic changes in the education scenario. Nursery students can be taught by showing pictures, animals, fruits etc. With the help of ICT tools students at this level are able to grasp a lot by hearing voices or sounds and animated motion of various animals. Language learning is also taught at this level. To know a new language at this age is easier as compared to other levels. Multimedia projector & computer can be used to teach phonetics and pronunciation. Lessons, poems & lectures by eminent scholars stored in computers or other ICT tools can easily be shown to the students time and again anywhere. Such type of teaching and learning retains for long time in the minds of the children. At high school level subjects like History, Geography, Political science, Physics, Chemistry, Biology, Physical education etc are taught. Lessons in these subjects can easily be taught by showing small movie related with the subject to create interest among the students. Such type of movies and related multimedia material is easily available at academic repositories and from various related sites with the help of Internet. Internet is basic tool which can be utilized by teachers and students to find any information on any topic. This type teaching –learning makes the environment very interactive and is liked by students. Educational and practical CD's available in the market make this task easier to implement. At college level various facilities like computers, Electronic Board, Edusat [1] facility initiated by various state Governments, MM projector and other peripheral devices related with teaching learning process are easily available. Easy availability of 'Aakash' tablet will help in providing and getting more education for both teachers and students. Repositories are libraries where these digital resources are stored and provide teachers, students, and parents with information that is structured and organized to facilitate the finding and use of learning materials regardless of their source location [6]. Various programs running on Edusat are also very helpful for the students. Soft skill program can help students in getting their placements in reputed Multi National Companies (MNCs). State level quiz and seminar can also be conducted with the help of Edusat infrastructure and can be transmitted throughout all institutes. Edusat [1] can be used for providing training to teachers on the latest subjects and technologies and can save lot of time and money of governments. In Haryana Edusat project is being implemented at school and college level and is being used for transmitting lectures according to syllabi. In Non-formal learning, learners can access information and learning materials from anywhere and at

any time. It includes distance education and other open learning systems. There are various functions to be performed with the enrolment of students in any course of distance education in any University or institute. Functions include allotment of unique number (called reference number/roll number), providing books, providing information related with installment of fees and details thereof to name a few. Out of all these activities some of these may be performed well with the help of ICT Tools. In the distance education ICT can be used for better management of records by making a complete database of all the students in various courses. Once the students are enrolled, a unique number is generated called reference number and it is provided to the particular students. Short Message Service (SMS) of Mobile phone may be utilized for this purpose. Mobile phone is one major ICT tool and can be used for the purpose. Other information related the PCP, Exam dates can easily be sent to the students through SMS by Universities/ Institutes concerned. Moreover the enrolled students can be given username and password for using various online services and resources in the form of academic repositories maintained by institutes. All such instructional material may be uploaded at the University portal and CDs of those lectures may be provided to the students instead of printed or hard copy material. Online fees payment system can also be made on the portal of concerned University or Institute. Students will be saved from a lot of hardships they face in depositing fees, attending PCPs, taking exams and many more. Exam results in such cases may be provided online on the same day as same is happening in case of online exams and entrance tests. This would help to sort out the problem of the delay in declaration of results of various exams by various universities. But all this must be the case for the Non-formal education system. Advantages of utilizing such tools include saving of lot of paper work and help the environment making it pollution free. This will also bring transparency in the whole system of functioning.

4. ICT for Content development and administration:

Only presence of ICT in education sector is not sufficient there is also great need for development of good and relevant quality content. ICT can be utilized for the major areas which are content and administration. In this area certain initiatives have been taken at state and Centre levels. For content development in India certain initiatives have been taken for creating digital repositories and learning objects. Such initiatives include Sakshat portal of Govt. of India (GOI),

National Programme of Technology Enhanced Learning (NPTEL) and Multimedia Educational Resource for Learning and Online Teaching (MERLOT) which create quality digital content for different levels of Education [11]. Certain states have also taken a step forward to bring transparency in the education system through ICT. Haryana has also taken a step in this side by providing certain machines for marking attendance of teachers in schools. Biometric attendance system can really help in improving attendance of those schools where attendance of teachers has always been a hot issue. Delhi Government has been a pioneer in using ICTs for better administration of the education system. The Department of Education, Government of Delhi, having a lot schools, teachers and students under its administrative jurisdiction has developed a comprehensive and functionally effective Web-based and GIS-based Management Information System (MIS). Employee Attendance Report also facilitates an objective inspection, as the attendance of all the schools are on display for the purview of the officers of the Department [12]. With the help of such a transparent system everyone including citizens, schools, zonal offices, district offices, regional offices, and various branches at the headquarters can share information using the Web-enabled software. Information for all stakeholders—students, teachers, and administrators—is available online through the Directorate's Web site (edudel.gov.in) this includes information on admissions, mark sheets, teacher attendance, transfers, and pay slips etc[11]. Certain initiatives like all correspondence may be done electronically, attendance of staff may be recorded daily online to the directorate, major notices, information regarding implementation of various Government schemes can be easily applied and can be shared by other departments as well for making improvement in the present system. Such types of initiatives provide transparency in the society which is the major requirement of the people in the present day. There may be many more examples of such initiatives but the need of the hour is to replicate related interoperable projects showing great impact on the society. United Nations Educational Scientific and Cultural Organisation (UNESCO) [21] has published a summary of case studies conducted in nine countries in different parts of world and most of these studies reflect the necessity of having multi-prong strategies for teacher education and to improve their expertise. Existing Open and distance education systems use different technology options for delivering content- EduSAT, other TV and Radio channels [18]. All these options use ICT. A local area network at school level can enable 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 [20]. At the same time benefits in savings of cost, time and effort will also be available.

5. ICT and teachers Training:

In the modern world of ICT there is decentralization of knowledge source. Technology is only a tool and it must be utilized only to remove the barriers and challenges present in the existing system. ICT provides opportunities to complement on the job training and continuing education for teachers in a convenient and flexible manner. Use of ICTs in education requires major shift in the way content is designed and delivered. New technologies cannot be imposed without enabling teachers and learners to understand these fundamental shifts. Ongoing training is necessary for the trainers in institutions and organizations who are engaged in the design of curriculum, teaching materials and delivery of ICT-enabled education [17]. ICT is applied in their teaching practices as well as for delivery for these trainings. In order to implement ICT-driven distance education programmes, the teachers must first understand and be comfortable with the technologies. They must be given opportunities for acquisition of a new knowledge. This can begin by promoting computer-training programmes for teachers. Use of ICTs for teacher training has been recognized by the governments of most South Asian countries and teacher training programmes like Intel Teach across India, Pakistan, and Sri Lanka; Microsoft Shiksha in India; and several other initiatives in Nepal and Bhutan are focused on using ICTs for training teachers [6]. The International Society for Technology in Education (ISTE) has created the most comprehensive set of ICT standards for teachers, students, and administrators [8]. The SSA has taken initiatives to strengthen Computer-Aided Learning (CAL) in collaboration with a number of private organizations after having a look at the advantages of ICT in Education for achieving the goals of SSA. Under the SSA framework, a provision has been made for computer education district-wise and is made available to each State under CAL interventions under PPP mode [11]. ICT can be applied for pre-service and in-service teachers training programmes. Through SSA and RMSA various block resource centre (BRC) offices exist in Haryana. Through these centre and infrastructure available at these centres in service training can be provided effectively. Instead of inviting teachers at district level they can be asked to assemble at least one

teacher from every school daily to get certain basic knowledge about ICT and its application in school curriculum. The training batches duration may be on weekly or fortnightly basis by expert in ICT and its implementation for education. In teacher training colleges, computers and the Internet can be used to increase teachers' basic skills of teaching and subject related knowledge by accessing the resources that can later be used in classrooms teaching. Visualiser can be easily operated and used by teachers which is an cost effective, easy to use and time saving tool for education in schools and colleges. It decreases teacher's preparation time, increases interactivity with students and student concentration in complex issues. It can also be used even without computer and is budget friendly. Small training sessions on how to use such new tools in educating schools may be arranged for interested teachers.

6. Challenges and solutions of applying ICT for learning:

Certain challenges also exist for the ICT based teaching learning. One of the great challenge for quality control in education is lack of standards for parameters to measure the quality of education. For the solution of this all the accreditation bodies like NAAC,NBA,AICTE,CBSE and other authorities must sit together and circulate a standard list of parameters to decide the quality of education. Development of ICT has changed the epic centre of knowledge and hence in many of the cases student is more informed than the teacher. Teachers lack adequate qualification and training and their lesson plans are most often outdated or irrelevant. Setting up the ICT devices can be very troublesome. It is expensive to afford it is hard for teachers to use with a lack of experience using ICT tools. These reasons destroy the available quality of education. ICT enabled distance education, to a great extent, can combat this problem. One of the important barriers is lack of trained teachers to exploit ICT proficiently. Most of the teachers are not willing to introduce new technologies to themselves first and subsequently to their students. There is resistant from teachers, basically from older teachers as compared to younger ones, to apply ICT in their subject.. Hence teachers need to update their knowledge and skills as per change in the curriculum and technologies. At present, ICT in school education is strictly limited to a handful of elite schools. Beyond that, it's just a computer lab that's held apart from the conventional educational process [19].Though computers came to Indian classrooms in the year 1984-85, the level of adoption of modern technology in the teaching and learning process

has been limited and uneven[15]. Various ICT tools must be available and it must be accessible at demand. Many schools have limited resources for buying books, stationery, furniture and other classroom materials. Role of private sector providing services in such sectors may be taken into account. Rural population may not be able to pay hefty amount to utilize such ICT resources for education. One of the major challenges in the implementation of ICT in education is the initial thinking that is based on the technology. ICT hardware and software are not designed as per educational purposes rather they are designed for general purpose. One first thinks about the available technology and then a try is being made to apply it into education field, but if we look at in reverse way then possible outcomes may be more useful and may give good results. As per latest tradition only special subject like IT or ICT is available and that is also optional one there is need for to have basic knowledge of computers and IT to utilize various ICT tools to be used for teaching learning. Only computer teachers would not be able to carry this important mission of being agents of change. To sort out infrastructure problems for providing ICT education in schools one can split the screen in half vertically and at two sets of an application can be displayed and used by two users (students) simultaneously. Because one student may use the keyboard and another may use mouse, each student can work independently of the other [9]. The survey [15] done in 2007 in two highly ICT enabled states Gujrat and Karnatka says that Access to government school students to ICT tools outside schools is in general low. The access of private school students to such devices is comparably better. It also shows that one of the challenges to be met is also of digital divide in private and Government schools and moreover in rural and urban schools also. Major challenge for educators and trainers is how to develop learning materials for delivery on available ICT tools including mobile devices. The learning materials should be in manageable learning chunks and should make use of multimedia. There are many advantages of using learning objects in mobile delivery including: they can be re-used and changed without affecting other learning objects, and they can be stored in an electronic repository for remote access at any time[22]. Barriers include costly supportive infrastructure, developing online material can be expensive and time consuming, quality, validity of online material, lack of flexibility in already prepared study material. A lot of information available online may dissuade student learning. Students can feel isolated in absence of classroom like environment [24]. Computer Programmes at various levels of quality parameters can be used to control, manage and put strict discipline in the campuses through use of computer application for

Curriculum development, Teaching and learning, Research and extension, Governance and leadership, infrastructural facilities and use of expert system in suggesting intelligent decisions to top management in policy making and other important areas in higher education [14].

Conclusion:

Quality in education through ICT and its awareness among stakeholders will have positive impact on the society. ICT can be helpful in quality and standards of education by implementing it in various phases of education. ICT can be employed in formal and Non-formal types of education and would eventually make the learners employable and socially useful part of the society. By employing ICT in teacher training can save a lot of money of the Government. Moreover a lot of qualitative improvement can be seen as resource persons for the training can be best of the world. By employing ICT in administration can help in solving the problem of Absenteeism of students and teachers. Good quality content is one of the major issue and directly affects the standards of education and quality. By overcoming the certain challenges involved in the process of education can help a lot in this side. Conclusively a lot of quality improvement is possible after careful and planned implementation of ICT in education by various stakeholders.

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