

## ICT a Boon to Education System

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### Abstract

Acquisition of knowledge is a right of every human being. Information and communication technology (ICT) has played an important role in providing education to every human being. ICT has revolutionized teaching-learning process. The blend of ICT and the internet has opened new doors of opportunities for the students. ICT not only enrich teachers and students with knowledge but saves time and gives them an entrée to powerful new ways to discover and fulfil the quest of knowledge and new concepts at a depth as earlier it was not possible. One of the major role for incorporating ICTs in education is to improve teaching-learning process by enhancing the quality of education and making it more interesting for the learner. ICT helps the learner to share learning resources, promotes collaboration and interpersonal skills and enhance sound reasoning, higher - order thinking, and inventive thinking. As the world is moving rapidly to digital media and information, the function of ICT in education is becoming more important in the 21<sup>st</sup> century. ICT based education is responsible in changing the educational objectives in the inception of the teaching and learning process.

**KEYWORDS** : ICT, inventive thinking, higher thinking ,teaching – learning process

### INTRODUCTION

Earlier in education system teacher or guru were the integral part of the education but today Information and Communication Technologies (ICT's) are becoming more prominent. Today technology is not only used in bank, administrative duties in education but also in teaching – learning process. The use of technologies such as PowerPoint and interactive whiteboard is making students more attentive, innovative which engage students in learning. Technology is also being used in the evaluation of students like on line examinations. Audience Response System (ARS), it permits instant feedback tests and classroom discussions. The incorporation of ICTs is not only for the individuals growth but it also helps to face the challenges of this competitive world. Through researches it is apparent that learning through simulation games; enables active learning through all senses. ICT empowers the individual for sustained self learning at their own pace which develops their confidence. Information and technologies like tablets, smart phones, computers etc are potentially powerful empowering tools for educational change and reform. School should not be a place of one way communication here, both way communication is necessary and it is only possible when ICTs are incorporated in education system.

The diffusion of ICTs has bestowed extremely to the increase of economies in developed nations and developing nations are sincerely making easier policy frameworks to make sure an impartial diffusion of these technologies. Today life is

faster due to technological development and infrastructure development. Technology new today will be old soon. New superior and evolved techniques are need of hour. The knowledge to develop the technology and acceptability to it, is a learning process i.e. the education.

Many commissions have been established to improve the quality of education in India. National Policy of Education (1986) proved to be the turning point in teaching and learning process. It provided a uniform system of education all over the country. Information technology is significant here to meet the need of range of learners and also other side to educators. Each individual of the society should possess technological literacy.

### **Need of ICT in Education**

Improving the standard of education and training is a crucial issue in the expansion of education. ICTs are also transformational tools which, when used properly, can encourage the shift to a learner-centered situation.

ICTs can improve the quality of education in several ways:

1. For motivation towards learning
2. Implementing the national vision, mission and strategy for development;
3. Developing the content and dissemination of information for good governance;
4. Developing education and research;
5. Developing Telecommunication and support infrastructure;
6. Developing education and teachers training ;
7. Facilitating the accession of basic skills;
8. Promoting the equal importance to slow and gifted children;
9. Increasing the Technology Literacy among citizens;
10. Increasing the literacy rate through Distance Education;
11. For Personality Development;

### **Scope of ICT**

The progress in telecommunications has affected very much on the applications of ICTs and their uses. Telecommunications technologies, together with computer technology have improved network-based information and communication platforms, such as the Internet. ICT helps in facilitating learning and swap of educational materials. ICTs are serving in library professionals store and manage educational information. The conventional library system has changed to on-line system, which is web- based categorization and search application. The on-line learning system is another web-based application that is revolutionize the learning platform of education. In the on-line system, students can access class notes, submit assignment and also join a discussion group with other learning.

ICTs can be very useful for the physically challenged in providing entrée to communication, education and by providing opportunities for them. Access to knowledge through ICT has not only benefitted the urban community but has also benefitted the rural community. They can share knowledge and improve access to information. Experts lecture through video conferencing and carrier guidance for the students will permit them to compete in this world of globalization. Through researches it is clear that the literacy rate in the rural community has increased due to ICT. The

function of ICT in Distance education program has helped not only the working class people but also for them who could not complete their education. The internet, for example has provide platforms for sharing information in application such as the E-Mail and The World Wide Web. ICT applications have become important resources in the medical field. They hold up proficient exchange of information between medical students and experts they can also get trained by looking at a virtual surgery.

### **Emerging Trends in ICT Multimedia in Education**

In general multimedia includes a blend of audio, still images, animation, video and interactive content forms. In education it is useful to make (CBTs) computer based training courses and reference books like encyclopaedia and almanacs. A CBT allows the user go through a sequence of presentation, text about a specific subject, and related illustrations in numerous information formats. Learning theory in the past decades has stretched dramatically because of the introduction of the multimedia.

### **E-Learning**

E-Learning is a form of education where the instruction medium is computer technology. With the help of E-Learning we can describe a particular method to attend a course of study where the learner rarely, if attend face-to-face or for on campus entrée to educational services, because they study on-line. E-Learning is logically suitable to distance learning and flexible learning, but it is also used in combination with face-to-face teaching, in that case the Blending Learning is commonly be used .E-Learning can be referred to educational web sites which offers learning scenarios, worksheets and interactive activities for children. E-Learning pioneer Bernard Luskin states that “E” must be made clear to have broad meaning if e-learning is to be effectual.

### **Goals of E-learning**

E-Learning lessons are designed in such a way which guides students through information or to help students to execute in particular tasks. Information rich e-learning content provides information to the student. Computer-based learning (CBL) refers to the use of computers as the main element of the educational settings. CBL broadly refers to a planned setting where computers are used for teaching purposes. Computer-based training (CBT) services are where a learner learns by performing special instruction programs on a computer. CBT is especially effectual for instructing people for more use of computer applications because the CBT program can be incorporated with the applications, which helps students in using the application as they learn.

## **ASYNCHRONOUS E-LEARNING**

### **Self-Paced Courses**

The advantage of self paced course is that it provides the training to the people at any time. This includes just-in-time training which provides a person the right training they need to execute a task. Self- paced courses are delivered in several ways including:  
Internet

Intranet or Local Area Networks (LAN)  
CD\_ROM or DVD  
Wireless

### **Virtual Classrooms**

Virtual learning is used to supplement the face-to-face commonly known as Blended Learning. A virtual classroom replicates the capabilities found in a real classroom. A virtual classroom provides a virtual gathering place as a substitute of a classroom. Teacher can let students speak through audio and video conferencing.

### **Simulation**

Simulation is ‘an interactive computer program that replicates some real world object. Simulation in education focuses on particular job. Earlier videos were used for teachers and students to examine, problem solve and role play; however, a more modern use of simulations in education includes animated narrative vignettes (ANV). ANVs have been used to evaluate knowledge, problem solving skills and pre- service and in-service teachers.

### **Effectiveness of Simulation for Enhancing Higher Order Thinking**

“Certain interesting parts from the real world can be copied on computers by means of simulation and micro worlds. In this way students can try and learn something with the help of the tools offered or with a simulated reality. The simulations have become an effective tool that helps teach thinking and reasoning skills. Simulation can be designed to incorporate many different educational philosophies, from behavioural through cognitive to constructivist. Simulation can help the efficiency of learning in that the learner takes less time to understand a subject when taught through simulation than other educational method.

### **Educational Games**

Educational games are among the most direct means of access that children and young people have to the world of technology. Educational games are programs that can easily be introduced in schools to teach specific curricular contents or to develop strategies and procedures. Most educators consider that it is possible to learn through play. Games form a part of the educational strategies used by teachers at most levels of the school and the university system. Games frequently involve movement; by stimulating precision, coordination of movements, speed and understanding how things work, resolving problems, devising strategies, etc.

### **CRC- CARDS**

CRC means Class, Responsibilities and Collaboration (CRC) Cards. CRC-Cards are tools for preparing in object-oriented thinking programmes. CRC-Cards are simple informal tools for collaborative object-oriented modelling. Many educators have accepted CRC-Cards as a means for instruction design early and a means to teach an object-oriented way of thinking. The power of the CRC-Cards approach is in its connected role-play activities. Situation role play is generally used in the social or

behavioural sciences to assess human nature in specific but hypothetical situations. In CRC-Cards interactivity is important as it supports creativeness and sharing of knowledge. Role play is an effectual way to simulate or discover hypothetical situations.

### **Impact of ICT at Students Level**

Students are the future of the nation and need to be trained according to requirement. They should be made aware of using ICT, its applicability and techniques. Students can make use of it for online learning through videos, lectures, tutorials. Online communications through e-mail and chat-server, discussion forums and blogs, virtual library of e-books and literature, news rooms can enhance the potentials of students. Security is another issue to play safe on internet, therefore it is necessary that the learner should be made aware of using security essentials for safe use of internet. It is encouraging students towards problem-based learning. The usage of ICT in educational environments, by itself acts as a medium of change in this sphere. ICTs are tools that motivate and supports self-regulating learning. Students when they use ICTs for learning purposes they become engross in the course of learning as more and more students use computers for source of information and cognitive tools (eg. Reeves & Jonassen, (1996), the impact of the technology for supporting how students learn will continue to increase. The wide variation of technologies that hold up learning are able to offer asynchronous supports for learning so that the requirement for real-time participation can be neglected while the advantages of communication and collaboration with other learners is retained.

### **Impact of ICT at Teachers Level**

The changing role of the teacher has seen increased opportunities for others to participate in the process including workplace trainers, mentors, specialists from the workplace and others. In Indian scenario teachers number is less comparative to student so it is necessary to provide virtual lectures by experts to remote students. The use of PowerPoint presentations, movie and animations is more interactive mode of teaching and deciphering knowledge beside time saving and efforts in drawing the diagrams, charts and graphs. Use of ICTs empowers the future teachers to accept the disciplinary approach in teaching and to develop interest amongst students in such studies. It allows them to build up the teaching competencies and performance skill for the subject they have to teach. ICTs have also been used to enhance access to and the standard of teacher training. For example, organizations like the Cyber Teacher Training Centre.

### **ICT in bringing the interactivity in classroom**

Classroom interaction is one of the most important challenge for effective teaching-learning. Without sufficient participation and engagement from students in classroom activities, learning cannot be fulfilled anyway. Mutual opportunities to talk about the classroom, proper guidance, creating an environment for participation and increasing students' autonomy level can make an impactful interaction in classroom learning (Burns\* & Myhill, 2004). On the other hand, interactivity is the most perceived advantage of using ICT in the classroom regarding supporting teaching (Beauchamp & Kennewell, 2010). Moreover, Kennewell, Tanner, Jones, and Beauchamp (2008) states that "The term 'interactivity', consequently, can be used to explain technical

interactivity as technology performs as an interface among the user and the matter and educational interactivity, which is itself an instruction strategy."

Beauchamp and Kennewell (2010) classified interactivity into five classes: no interactivity with ICT, authoritative interactivity, dialectic interactivity, dialogic interactivity and synergistic interactivity. Potential of innovative and interactive education was the focal point to provide access to technology especially in schools in Europe from the last decade (Blandow & Dyrenfurth, 1994). The majority of schools in developed countries are equipped with PCs, interactive whiteboards (IWBs) and internet connection. Moreover, some schools already provide extensive area networks (WAN) for a better interaction between pupils and teachers even outside the classroom (Cachia et al., 2010). Though replacing traditional tools with digital equipment cannot ensure creativity or innovation in education, most of the schools have access to technologies for their teachers. These techniques are based on notions of networking which allow teachers to develop collaborative forms of learning. Schools in Europe have their website where they share their information on regular basis, and teachers use platforms like Moodle, wikis, and blogs to teach in the classroom. Nonetheless, textbook remains the primary resource for teaching. It is essential to make a suitable combination of pedagogy and technology which can bring more creativity to teaching and learning (Cachia et al., 2010).

Students need to understand or realize the primary and innovative use of technology if we wish to ensure sustainable, innovative knowledge generation. Without the proper concept of using technology, there is a high probability of using familiar forms and ideas in using the tools. It can make an obstacle to exploring new connections and different ways of creating things (Loveless, 2008).

### **Effective and quality education**

By enhancing the standard of education and instruction, enhancing the assessment system, and reducing dropout from class, ICT has introduced a new era globally. It has transformed the education system from a teacher-centered system to a student-centered one in a very smooth way. This transformation empowers student towards better problem-solving abilities, more creative thinking, better communication skills and other improved higher order thinking (Trucano, 2005). Many nations believed in this transformation, and they re-introduced their policy on reflecting on this issue (ADB, 2012), while it may also be reflected in national educational targets.

On the contrary, the conventional and rigid, face to face classroom system makes student bored, and they lose their interest to attend classes. This boredom causes dropouts from the diverse levels of the educational system. Students from wealthier families go for private tuition to increase the chances for a better result in school; this is not feasible for the students from comparatively poor backgrounds. Using ICT in classroom activities can make these classes more exciting and can increase the attention of students easily (Haddad & Draxler, 2002).

ICT is treated as an essential driver of improvement and growth in a modern society. ICT for education enhances the support of development by creating a skilled workforce. It also has an immense effect on research and development activities (ADB, 2009). ICT use in education increase students' technical and cognitive ability to access, create and develop. It also enhances the potential of teaching-learning

activities (ADB, 2009). Moreover, a technology-enabled environment make sure that the efficient flow of information, and using technology in school makes it more accessible and usable (Mohd & Zainab, 2002). Also, to advance the next rungs of the development ladder, it is essential to integrate ICT in teaching-learning situations which can develop the standard of a country`s human capital and student`s capability of using information (ADB, 2009).

### **Constraints in the Integration of ICT in Education**

While using ICTs in teaching has some clear benefits, ICTs also bring challenges. Incorporation of ICTs in pedagogy may face numerous challenges with respect to installation and policy, planning, infrastructure, capacity building and financing. The other problem is the basic need of electricity and Telephone networks is not accessible Lack of appropriate hardware and software materials, administrative and technical support, high cost of acquiring, installing, operating, maintaining and replacing ICTs. To accommodate the technology many schools and collages do not have proper rooms or buildings.

Content development is an important part that educators overlook. Thus, for the effectiveness of ICT integration, administrators must be proficient and have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education. There is lack of motivation among the teachers, educators & the prospective of teachers concerning the use of ICTs in their future classes. Teachers should have the knowledge and skills to use the new digital tools and resources to help all students achieve high academic standards. There is lack of the funding for new ICT resources and equipments.

### **National Efforts**

In India the importance of ICT has been understood and suitable schemes are started to upgrade the education and utility of ICT. Department of School Education and literacy, Ministry of Human Education and Literacy, Government of India (2012) under the National Policy in education 1992 stressed the requirement to employ educational technology to enhance the standard of education through schemes namely Educational Technology (ET) and Computer Literacy and Studies in School (CLASS). Financial assistance is provided by government for procurement of computers and peripherals, education software, training teacher, development of e-content, internet connectivity and setup of smart schools. Information and library network (INFLIBNET) centre is an autonomous inter-university centre of university grand commission (UGC) of India, which is involved in modernizing and connecting the university libraries in India through high speed internet connections. This has facilitated the access of literature and e-books as online version to the researches and students (INFLIBNET Centre, 2014).

### **International Efforts**

Online education is provided through ICT by any educational institute and Universities to train the distantly locating learners. Lectures, videos, online notes, tutorials and presentation are made available to students and other society members through institutional web site. Online webinars are mean to organize the interactive virtual seminars/hands-on-training for the learners all over the world. This is more convenient for tutors to decipher his/her knowledge and experiences without physically attending

the conference/seminar and also to participants too. Wikipedia is most popular Website which is free access free content internet encyclopaedia supported and hosted by non-profit Wikipedia foundation ( Kiss and Gibbs, 2014). Universal data repository and distributor NCBI ( National Centre for Biotechnology Information), DDBJ ( DNA data Bank of Japan) and EBI ( European Bioinformatics Institute) are providing data on biological research and education, computational analysis and submission tools, tutorials, e-books, literature and training to researches and students all over the world.

### **Demerits and Limitations of ICT in Education**

ICT not only simplifies and facilitates human activities has many limitations too. Many people think of ICT as important solution to problems and improvements in education system. The limitations of ICT can be as teacher related, student related, and technology related which limits the benefits of ICT to education.

1. Dependency on ICT confines student's critical thinking and logical skills.
2. Spending hours and hours on Computers can cause physical side-effects such as vision problem.
3. Improper monitoring of students may direct them to visit unwanted sites.
4. Use of ICT may be difficult for students, who cannot afford the expenses of computer and Internet.
5. Pace of change and stress created due to speedy work through ICT may be transferred to students
6. Plagiarism is major problem due to technology advancement has made it easy to reproduce and revise someone's work.
7. Teachers need extra time to learn new technology and software.
8. Maintenance of equipment is required to operate a technologically enhanced school.

### **Conclusion**

Use of ICT has improved the learning environment leading to collaborative, creative, integrative, and evaluative learning. Introduction of New policies and technology in world has upgraded the level of education. The enhancement in education system helps deeply in overall development of human and directly the Nation. Ultimately the use of ICT in education can increase access to learning opportunities by making difficult concept easier one. It also enables them to think independently and communicate creatively. It helps students for building successful careers and lives, in an increasingly technological world. It would provide the proper setting and inspiration for education system which seems to have a deep effect on the process of learning in education by providing new possibilities for students and teachers. These possibilities can have an effect on student performance and attainment. ICT will definitely bring revolution in teaching learning process by increasing the rate of literacy.

### **References**

**Beauchamp, G., & Kennewell, S. (2010).** *Interactivity in the classroom and its impact on learning. Computers & Education, 54(3), 759-766.*

- Blandow, D., & Dyrenfurth, M. J. (1994).** *Technology education in school and industry: emerging didactics for human resource development (Vol. 135): Springer Science & Business Media.*
- Burns\*, C., & Myhill, D. (2004).** Interactive or inactive? A consideration of the nature of interaction in whole class teaching. *Cambridge Journal of Education*, 34(1), 35-49.
- Cachia, R., Ferrari, A., Ala-Mutka, K., & Punie, Y. (2010).** Creative learning and innovative teaching. *Final report on the study on creativity and innovation in education in the EU member states*
- Collis, B. (2002).** *Information technologies for education and training.* In Adelsberger, H., Collis, B., & Pawlowski, J. (Eds.) *Handbook on Technologies for Information and Training.* Berlin: Springer Verlag.
- Duffy, T., & Cunningham, D. (1996).** *Constructivism: Implications for the design and delivery of instruction, Handbook of research for educational telecommunications and technology (pp. 170-198).* New York: MacMillan.
- Girasoli, A.J. & Hannafin, R.D. (2008).** Using asynchronous AV communication tools to increase academic self-efficacy. *Computers & Education.* 51 (4), 1676-1682.
- Haddad, W. D., & Draxler, A. (2002).** *Technologies for Education: Potential, Parameters, and Prospects.*  
*ICT (Information and Communication Technologies) in Education* available on <http://www.questia.com/library/education/curriculum-and-instruction/educational-technology/ict-in-education>
- Jeyamani, P. (1991).** *The effectiveness of the simulation model of teaching through Computer Assisted Instruction (CAI).* *Fifth Survey of Research in Education.* M. B Buch., (Ed). New Delhi: NCERT. P 1375.
- Loveless, T. (2008).** *The misplaced math student. The 2008 Brown Center Report on American Education: How well are American students learning.*
- Mohd, S., & Zainab, A. (2002).** *Information literacy programmes in Malaysian public universities: an observation.*
- Stark, R., Simpson, M., Gray, D. and Payne, F. (2000).** *The impact of information and communications technology initiatives.* *Interchange Series.* Edinburgh: The Scottish Executive Education Department. [www.scotland.gov.uk](http://www.scotland.gov.uk)
- Trucano, M. (2005).** *Knowledge maps: ICTs in education: Washington, DC: infoDev/World Bank.* Retrieved from <http://www.infodev.org/en/Publication>.
- UNESCO, Thematic Debase: From Traditional to Virtual: The New Information Technology, World Conference on Higher Education, Paris, 5-9 October 1998.**  
**Reddi, U —Role Of ICTs In Education And Development: Potential, Pitfalls And Challenges** available on [http://www.unesco.org/education/aladin/paldin/pdf/course01/unit\\_13.pdf](http://www.unesco.org/education/aladin/paldin/pdf/course01/unit_13.pdf) —