

## **AN EFFECTIVE USE OF ICT IN THE CREATION OF LEARNING ENVIRONMENT**

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### **ABSTRACT**

*Information and Communication Technologies (ICT) have become commonplace elements in all sides of life. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education is able to more student-centred learning settings. But, due to the rapid developments into digital media and information, the role of ICT in education is becoming more and more important and this importance will aid to grow and develop in the 21st century. ICTs play an significant role to play in changing and modernizing educational systems and ways of learning ICT enabled activities and processes in order to increase accessibility, quality and competency in education system.*

*This paper will show how ICT in academics, in community learning centres or NGO resource centres are involved to creating learning environments that imparting basic education for all.*

**KEYWORDS:** *Information and Communication Technology, ICT literacy, Academic Libraries in E-Learning Environment, ICT Initiatives in India, Programme Monitoring And Evaluation Group (PMEG)*

## **1. INTRODUCTION**

Information and Communication technology is a term used to describe the range of equipment (hardware: personal computers, scanners and digital cameras) and computer programs (software: database programs and multimedia programs), and the telecommunications infrastructures (phones , faxes, modems, video conferencing equipment and web cameras) that allow us to access, retrieve, store, organize, manipulate, It includes 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.

According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. However, there appears to be a misconception that ICTs generally refers to ‘computers and computing related activities’. This is fortunately not the case, although computers and their application play a significant role in modern information management, other technologies and/or systems also comprise of the phenomenon that is commonly regarded as ICTs. Pelgrum and Law (2003) state that near

the end of the 1980s, the term ‘computers’ was replaced by ‘IT’ (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term ‘ICT’ (information and communication technology) around 1992, when e-mail started to become available to the general public (**Pelgrum, W.J., Law, N., 2003**). According to a United Nations report (1999) ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities.

**According to UNESCO (2002)** information and communication technology (ICT) may be regarded as the combination of ‘Informatics technology’ with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs etc. have been used in education for different purposes (**Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007**).<sup>1</sup>

During the past few years, the world has witnessed a phenomenal growth in communication technology, computer network and information technology. Development of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technology tools for teaching and learning system. The integration of computers and communications offers

unprecedented opportunities to the education systems with its capacity to integrate enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The growth of these communication and computer systems, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom. It has the potential to transform the nature and process of the learning environment and envision a new learning culture. It enables learners to access, extend, transform and share ideas and information in an easy way. It helps the learner to share learning resources and enhances critical thinking, creative thinking and problem solving skills.

ICT tools help to open up opportunities for learning by enabling four major key processes in transforming teaching and learning as follows:

**Access** ideas and information from diverse sources through searching, locating, selecting, and authenticating material in a wide range of multimedia forms;

**Extend** ideas and information through processing, manipulating, analyzing & publishing material in different multimedia forms;

**Transform** ideas and information into new or different forms through synthesizing, modeling, simulating and creating material in many multimedia styles and formats

**Share** ideas and information across local, national and international networks by interacting electronically with others in actual and/or delayed time.<sup>2</sup>

## **2. ICT as a Tool for Achieving Literacy for all**

The use of information and communication technologies (ICT) continues to expand exponentially, bringing unprecedented opportunities for achieving greater educational access and success. Given this potential, UNESCO recognizes that attention should be paid to how ICT can contribute to increasing access to literacy and improving the quality of literacy education.

Computer “literacy” and information “literacy”, are necessary skills to cultivate in emerging knowledge societies, the ability to read and write is a prerequisite for gaining many of these abilities. Furthermore, studies indicate that although learning to read and write requires significant guidance and a degree of formalized education, learning to use a computer and other modern technologies can be an intuitive process. The “Hole-in-the-Wall” study, for example, which setup computers in public spaces in slum areas of India, found that curious children in these areas became proficient in browsing the Internet and using certain computer programs within days, without any formal teaching. This example demonstrates that, for children at least, it is possible to gain basic computer skills without formalized assistance. This implies that the various forms of “literacy” associated with the rise in use of new forms of ICT, such as “mobile literacy”, do not require the same degree of emphasis and investment that learning to read and write requires.<sup>3</sup>

### **3. ICTS’ ROLE IN PROMOTING LITERACY**

#### **3.1 Enhancing Learning via ICT Tools**

##### **3.1.1. Audio and video:**

The Project on Radio Education for Adult Learners (PREAL) aimed to enhance the functional literacy and reinforce the reading ability of women in rural areas of India through structured radio lessons. PREAL also aimed to use radio technology to increase awareness of the need for literacy and educate listeners on issues relating to daily survival.

Television, video, video-compact-disc (VCD) and digital video disc (DVD) technologies, provide words, images, movement and animation in combination with audio. This combination can facilitate reading comprehension and accelerate literacy learning. Such forms of ICT can also be entertaining and thereby motivate the target audience to watch and learn. Television and other audio-visual media can also provide a means by which to stimulate discussion and critical thinking.

##### **“Chauraha” Television Programme for Learning the Alphabet**

One of India’s initiatives using ICT to enhance literacy learning, this programme involved the regular screening of a television programme titled “Chauraha” (“The Crossroads”), on a State-run television channel. The programme taught the Hindi alphabet using puppets and a drama narrative.

### **3.1.2. Audiobooks:**

Audiobooks available on audiocassettes and CDs are recorded books. They are believed to be useful in raising learners’ interest in reading and, when used in conjunction with written texts, are useful in improving learners’ comprehension of text. Learners can listen to the audio version of a book and follow along silently with the printed version. In addition, because hearing text read aloud improves reading ability, learners can improve their reading skills by reading the text aloud in conjunction with the audio.

### **3.1.3. Computers, tablets and mobile devices:**

Computers and tablets enable learners and educators to access websites as well as programs such as Microsoft Word, PowerPoint, PDF files, and images. Many mobile devices support m-learning. OpenCourseWare (OCW) gives free public access to information used in undergraduate and graduate programs. Participating institutions are MIT and Harvard, Princeton, Stanford, University of Pennsylvania, and University of Michigan.

### **3.1.4. Social networks:**

Group webpages, blogs, and wikis allow learners and educators to post thoughts, ideas, and comments on a website in an interactive learning environment. Social networking sites are virtual communities for people interested in a particular subject.

Members communicate by voice, chat, instant message, video conference, and blogs, and the service typically provides a way for members to contact friends of other members. The

National School Boards Association found that 96% of students with online access have

used social networking technologies, and more than 50% talk online specifically about schoolwork.

In a study by Bowers-Campbell (2008) Facebook was used as an academic motivation tool for students in a developmental reading course.



### **3.1.5. Webcams:**

Webcams and webcasting have enabled creation of virtual classrooms and virtual learning environment.

### **3.1.5. Virtual classroom:**

A Virtual Learning Environment (VLE), also known as a learning platform, simulates a virtual classroom or meetings by simultaneously mixing several communication technologies. For example, web conferencing software such as GoToTraining, WebEx Training or Adobe Connect enables students and instructors to communicate with each other via webcam, microphone, and real-time chatting in a group setting. A virtual classroom provides the opportunity for students to receive direct instruction from a qualified teacher in an interactive environment. Learners can have direct and immediate access to their instructor for instant feedback and direction.

### **3.1.6. Bridges to the Future Initiative**

The Bridges to the Future Initiative (BFI) aims to address the education and skills divide separating the rich and the poor by improving literacy, basic education, and technological abilities. In India, BFI seeks to improve the basic skills, literacy and vocational skills of

out-of-school youth and young adults in poor communities in various states, using innovative and cost-effective ICT tools.

### **3.2. BROADENING ACCESS TO LITERACY EDUCATION:**

ICT can help to overcome many barriers which limited the access to literacy education. For example, forms of ICT such as radio, television and the Internet can help overcome geographical barriers by facilitating distance learning, thereby bringing literacy education to people who live in areas that are difficult to reach. For examples: IGNOU

Videoconferencing and teleconferencing are other technologies that can be used in literacy education. The use of these interactive technologies to communicate over long distances can save travelling time and money. For example, rather than bringing a teacher to a school in an outlying area, the use of videoconferencing can bring the teacher's expertise to the students for a relatively low cost, and allow teachers to share their knowledge with others without requiring an absence from their normal classes.

### **3.3. PROFESSIONAL DEVELOPMENTS OF TEACHERS**

Qualified and trained teachers represent the key to quality teaching and learner motivation. However, in many countries professional expertise is limited and thinly distributed, particularly for the provision of non-formal literacy education. While ICT cannot be substitutes for teachers, ICT can supplement and support teachers by reducing their workload and enhancing their lessons. In addition, ICT can be used as effective tools in the professional development of teachers. For example, television, video and DVD

technologies can be used to show examples of best practice teaching methodologies. Similarly, computers and computer programs can be used to train teachers in certain subjects. Also, teleconferencing can be used to enable interactive training over long distances, making in-service training affordable and simpler for teachers working in remote areas.

For example, the **Training and Development Communication Channel (TDCC)**, established in 1995, utilized video, videoconferencing and satellite technology to provide interactive distance education for teachers in remote areas of India.

### **3.4. CULTIVATING A LITERACY-CONDUCTIVE ENVIRONMENT**

For literacy to become widespread in a society, written material should also be readily available in daily life and accessible to all. Such an environment cultivates opportunities for coming into contact with, and creating, written material and thereby reinforces and promotes the development of literacy skills.

ICT can be utilized to help make written information part of everyday life. For example, television can be a tool for bringing written material into daily life when text is screened in conjunction with images on the television screen, such as subtitles on television programmes.

Similarly, short message service (SMS) technology, which allows subscribers to use their dial pads to type and send text-based messages through their mobile phone, encourages the

development of skills in reading and writing and is therefore a means by which written material, and literacy skills, can become a part of everyday life.

With the introduction of ICT, particularly Internet connection, these Community learning centres (CLCs) are serving as a means to cultivate literacy by providing free or low-cost access to written material as well as courses in reading and writing skills.<sup>4</sup>

**4. Changes via Effective Use of ICT**

<b>Changes in Teaching-Learning Environment</b>			
<b>MODEL</b>	<b>FOCUS</b>	<b>ROLE OF LEARNER</b>	<b>TECHNOLOGY</b>
Traditional	Teachers	Passive	Chalk & Talk
Information	Learners	Active	Personal Computer
Knowledge	Group	Adaptive	Pc+ Network

<b>Changes in Teachers' Roles</b>	
<b>FROM</b>	<b>TO</b>
Transmitter of Knowledge	Guide & Facilitator of Knowledge
Controller of Learning	Creator of Learning Environment
Always Expert	Collaborator & Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Did active	Interactive

<b>Changes in Learners' Roles</b>	
<b>FROM</b>	<b>TO</b>
Passive Learner	Active Learner
Reproducer of Knowledge	Producer of Knowledge
Dependent Learner	Autonomous Learner
Solitary Learner	Collaborative Learner
Solely Learning Content	Learning to Learn/Think/Create & Communicate

All these changes taking place in learning and teaching demand a new learning environment to effectively use of ICT to improve learning. Hargreaves (1997) and Meighan (1997) argue that merging ICT and education requires organizational changes at the level of the whole system: in the direction of allowing more distance-learning or even virtual schooling, thus changing the attitude towards time, place, curriculum and other connected attributes of the system.<sup>5</sup>

### **5. ICT ENHANCING QUALITY AND ACCESSIBILITY OF EDUCATION**

- One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world.

- Mobile technologies and seamless communications technologies support 24x7 teaching and learning.
- In developing countries like India, effective use of ICT for the purpose of education has the potential to bridge the digital divide.
- There exist drawbacks in general education in India as well as all over the world like lack of learning materials, teachers, remoteness of education facilities, high dropout rate etc. (UNESCO,2002). Innovative use of Information and Communication Technology can potentially solve this problem. Internet usage in home and work place has grown exponentially (McGorry, 2002).
- ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers (McGorry, 2002).
- ICT can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004).
- ICTs also allow for the creation of digital resources like digital libraries where the students, teachers and professionals can access research material and course material from any place at any time (Bhattacharya and Sharma, 2007; Cholin, 2005). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material.

- ICT eliminating time barriers in education for learners as well as teacher. It eliminates geographical barriers as learners can log on from any place (Sanyal, 2001; Mooij, 2007; Cross and Adam, 2007; UNESCO, 2002; Bhattacharya and Sharma, 2007).<sup>6</sup>
- ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating and conducting research.
- ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn.

## **6. ICT ENHANCING LEARNING ENVIRONMENT**

ICT presents an entirely new learning environment for students, thus requiring a different skill set to be successful. Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (New Media Consortium, 2007).<sup>7</sup>

ICT environment improves the experience of the students and teachers and to use intensively the learning time for better results. The ICT environment has been developed by using different software and also the extended experience in developing web based and multimedia materials. ICTs have an important role to play in changing and modernizing educational systems and ways of learning.

## **7. POSITIVE IMPACTS OF ICT USE ON LEARNING ENVIRONMENTS**

1. Promote active learning and authentic assessment
2. Engage students by motivation and challenge
3. Provide tools to increase student productivity

4. Increase learner independence
5. Increase collaboration and cooperation
6. Overcome physical disabilities.<sup>8,9</sup>

## 7. ROLE OF ACADEMIC LIBRARIES IN E - LEARNING ENVIRONMENT

### VIA ICT

The role of the libraries is changing in the E learning environment. Now a day's library should provide additional service in addition with the services provided by the libraries.

The academic libraries should be ready to provide the following services to the users in the E learning Environment:

- Academic libraries should prepare **collection development policy** to select, acquire both print and electronic recourses and also download and collect the open sources for the users.
- Academic libraries should provide **User Education Programme** to the users about the resources available in the library so that users can access the resources effectively.
- The important **useful sites** should be communicated and displayed in **the notice board** for effective use.
- **Hyperlink to the useful sites** may be provided in the library's website.
- Library website should **provide bulletin boards** enabling their users to discuss their ideas and share information on different topics.

- **Computer Literacy Programme** and **Information Literacy Programme** should be conducted regularly to aware the users about latest ICT and search strategy so that users can access the required information without wasting time.
- Indian academic libraries should prepare database for **Information Repositories and full text electronic repository** of the publication of the universities for effective utilization of the documents.
- Academic Libraries should provide **high speed Internet connection** to the users so that the access of resources can be done easily.

Apart from serving the users of the academic library it may also extend the **infrastructure facility for e-learning environment** so that the society will be benefitted.

## 9. ICT INITIATIVES IN INDIA

At the Government level several national policies and schemes on ICT in India are implemented.

### 9.1. Policy

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

The significant role of ICT in School Education has been highlighted in the National Curriculum Framework 2005(NCF).

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

## **9.2. Scheme**

India recognized the importance of ICT in education as early as 1984-85 when the Computer Literacy and Studies in Schools (CLASS) was initially introduced as a pilot Project with the introduction of BBC micro-computers.

### **9.2.1. Information and Communication Technology (ICT) in Schools**

**The Information and Communication Technology (ICT) in schools** have been included in the Rashtriya Madhyamik Shiksha Abhiyan (RMSA). Now ICT in Schools is a component of the RMSA. The Information and Communication Technology (ICT) in Schools was launched in December, 2004 and revised in 2010 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process. The Scheme is a major catalyst to bridge the digital divide amongst students of various socio economic and other geographical barriers. The Scheme provides support to States/UTs to establish computer labs on sustainable basis.

**The scheme has essentially four components:-**

- The first one is the partnership with State Government and Union Territories Administrations for providing computer aided education to Secondary and Higher Secondary Government and Government aided schools.
- The second is the establishment of smart schools, which shall be technology demonstrators.
- The third component is teacher related interventions, such as provision for engagement of an exclusive teacher, capacity enhancement of all teachers in ICT and a scheme for national ICT award as a means of motivation.
- Fourth one relates to the development of a e-content, mainly through Central Institute of Education Technologies (CIET), six State Institutes of Education Technologies (SIETs) and 5 Regional Institutes of Education (RIEs), as also through outsourcing.

**9.2.2. National Mission on Education through Information and Communication Technology (NMEICT)**

The National Mission on Education through Information and Communication Technology(NMEICT) has been envisaged as a Centrally Sponsored Scheme(CSS) to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time anywhere mode

**9.2.3. Shaala Darpan**

Work has started on “Shaala Darpan” to ensure that from next academic year, parents of students of Government aided schools can via a mobile application access updates on their child’s progress regarding attendance, assignments, and achievements.

A number of private companies and institutions such as NIIT ,APTECH, Institute of Management Technology, Ghaziabad come forward and started offering ICT programmes. IGNOU Doordarshan Telecast started telecasting education programmes from 1991 for distance learners. EDUSAT was another steps in 2004 to provide education to millions of people at their doorsteps.

The Indian NGO sector is also involving in providing education to the disadvantaged sectors the society by using ICTs. For example, Smile Foundation of Ahmadabad has begun an innovative programme called the **Twin e-learning programme (STeP)** which increases the Job-Oriented skills to youth living in urban slums and outer edge of rural area.

In Kolkata, Jesuit run media centre in school using audio- visual materials to make lessons interesting called Chitrabani.

#### **10. PROGRAMME MONITORING AND EVALUATION GROUP (PMEG)**

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

- An Inter-Ministerial Group consisting of members from the Ministry of HRD, Ministry of Communications and Information Technology, Ministry of Information and Broadcasting, Department of Space, Department of Science & Technology, Ministry of Power, Ministry of New and Renewable Energy, Ministry of Labour and Ministry of Rural Development and such other Ministries dealing with issues related education, will be set up and tasked with the responsibility of guiding technological choices and specifying cost effective and optimum infrastructure and connectivity.<sup>10</sup>

## **11. CONCLUSION**

ICT seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. The adoption and use of ICTs in education have a positive impact on teaching, learning, and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. It is important for developing nations to consider key strategies to uplift the ICT literacy of the populations, and also provide low cost access to ICT so the nations can take benefits of ICT to improve their overall productivity. A large portion of population of India can make literate via these innovative information communication technologies.

India shows enormous geographic and demographic disparity in ICT use. India has one of the largest ICT workforces in the world. One can find intense ICT use in technology clusters such as Bangalore and Gurgaon or amongst the upper middle brackets of incomes. The other side of the story is that large parts of the country lack even telephone connectivity.

There are many challenges and obstacles in the way of implementing these technologies in the creation of learning environment but these challenges are solved both at Government level and the efforts of private institutions.

## **REFERENCES**

- Syed Noor-Ul-Amin. An Effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge, Research, and Experience: ICT as a Change Agent for Education (A Literature Review), Pp. 1-2
- Majumdar, Shyamal. Emerging Trends in ICT for Education & Training.
- Samudhram, A. (2010). Building ICT literate human capital in the third world: A cost effective, environmentally friendly option. In C.H. Steel, M.J. Keppell, P. Gerbic & S. Housego (Eds.), Curriculum, technology & transformation for an unknown future. Proceedings ascilite Sydney 2010 (pp.844-851).
- UNESCO. (2006). ICT to Develop Literacy. Bangkok : United Nations Educational, Scientific and Cultural Organization(UNESCO)
- Ben Youssef, Adel; Dahmani, Mounir (2008). The Impact of ICT on Student Performance in Higher Education:Direct Effects, Indirect Effects and Organizational

Change. In The Economics of E-learning [online monograph]. Revista de

Universidad y Sociedad del Conocimiento (RUSC). Vol. 5, no. 1. UOC.

- *Op. cit.* Syed Noor-Ul-Amin. An Effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge, p.no. 4
- *Loc cit.* Syed Noor-Ul-Amin, p.no. 5
- Newhouse, C. Paul. (2002). Literature Review: The Impact of ICT on Learning and Teaching. Specialist Educational Services, Perth, Western Australia. December, Pp. 3 of 73.
- Condie, Rae and Munro, Bob. (2007). The Impact of ICT in Schools – a landscape review. January
- Department of School Education and Literacy, Ministry of Human Resource Development Government of India. (2012). National Policy on Information and Communication Technology (ICT) In School Education.