INFORMATION COMMUNICATION TECHNOLOGY AND ITS KEY COMPONENTS

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INTRODUTION

Information and Communication technologies (ICT) have become commonplace entities in all the aspects of life. ICT has fundamentally changed the procedures and practices of business and governance. With the world moving rapidly into digital media and information, the role and impact of ICT in education is becoming extremely important and will continue to grow and develop further. The concept of ICT has been explained and defined in various ways. ICT has been mentioned as the digital processing and utilization of information by the use of electronic computers. It includes the storage, retrieval, conversion and transmission of information. (Okauru, 2012). Information and communications technology has also been defined as an umbrella concept that involves many communication device/ application, television, cellular phones, computer and network hardware and software, satellite systems as well as the other services and applications associated with them, such as videoconferencing and distance learning. However ICTs are often mentioned in a particular context, such as ICTs in education, health care, or libraries etc. (Margaret Rouse 2005). Literature reflects that the term ICT is commonly used as a synonym for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones. It is referred as the study, design, development, application, implementation, support or management of computer-based information systems. (Chandler, D., 1995).

A branch of engineering dealing with the use of computers and telecommunications equipment to store, retrieve, transmit and manipulate data. (Daintith, John, ed., 2009). It covers all forms of computer and communications equipment and the software used to create, design, store, transmit, interpret and manipulate information in its various formats. Some examples of the diverse array

of ICT tools includes: Personal computers, laptops, tablets, mobile phones, transport systems, televisions, and network technologies.

On the basis of the level of information and communication technology accessed, India has been ranked a low 131 out of 167 nations on a global index. The households with Internet and computer have increased in the country over the last five years but its utility in various domains still remains limited. UN International Telecommunications Union's flagship annual measuring the Information Society Report mentioned that globally 3.2 billion people are now online, representing 43.4 per cent of the world's population. The report also reflects that the 167 economies included in the ICT Development Index (IDI) improved their IDI values between 2010 and 2015 — meaning that levels of information and communication technology (ICT) access, use and skills continue to improve all around the world. This provides for a huge opportunity space in the utility of ICT in the higher education sector.

The National Mission on Higher Education through ICT

The National Mission on Education through Information and Communication Technology (ICT) is a Centrally Sponsored Scheme for the development of higher education in India through leveraging the potential of ICT. The Gross Enrolment Ratio (GER) in Higher Education would be enhanced by 5 percentage points during the XI Five Year Plan period due to ICT Intervention. This would help in ensuring access and equity in Higher Education. The major components of the mission are 1) content generation and 2) Connectivity. It aims as bridging the gap and act as a bridge between the digital divide in urban and rural teachers/learners in Higher Education domain. It aims at empowering those who have remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

 The major focus areas include appropriate pedagogy for e-learning, providing facility of performing experiments through virtual laboratories, on-line testing and certification, on-line availability of teachers to guide and mentor learners, training and empowerment of teachers to effectively use the new method of teaching & learning, effective utilization of Education Satellite – EduSAT and Direct to Home- DTH Platforms.

ICT Tools in education

There are five categories of ICT tools that can greatly contribute to the teaching learning process. These five classifications of the ICT tools were made by Lim & Tay (2003).

a) Informative tools

These tools are the computer based applications that provide a large amount of information in various formats like text, graphics, sound and video. Chen & Hsu (1999) have described these tools as a passive repository of information. Internet is the most significant ICT tools in e-learning environment. There was a project by Pew Internet & American Life project in 2002 that discovered that three out of five children utilized internet to do their homework (Levin & Arafeh, 2002). Students considered the internet as a virtual textbook, virtual tutor, library resource, learn to study shortcuts and virtual study groups (McNeely, 2005).

b) Situating Tools

These are the tools that lay the students in the environment where there is occurrence of a situation. Some of the examples of such tools are; simulation, virtual reality and multiuser domain. CD-ROM is situating tools software that offers hypermedia applications to enhance the teaching learning environment. The hypermedia application covers more than one of the following media like text, audio, still images, animation and video clips. Cheung & Lee (2000) have indicated in their work that integration of hypermedia in learning environment enhances the student's autonomy and thinking. A multimedia presentation will help to conceptualize the theories in the real world situation, thus increasing the student's conceptual tools of the discipline in authentic practice (Phillips, 2006).

c) Constructive Tools

These are general purpose tools that can be used to manipulate information, construct own knowledge and visualize students understanding. Microsoft word and PowerPoint have a strong impact in enhancing the teaching learning process. It is widely used in education sector in various forms like memos, reports, letters, projects, records, presentations etc. (McMahon, M. 1997). Students can make correct sentences and texts including spell checking, dictionaries, grammar check etc. Spreadsheet like Excel is very important in teaching and learning as it provides for multiple calculations, automated formulas and various statistical tools.

d) Communicative Tools

These tools allow easy communication between students and teachers outside the physical barrier classroom (Chen, D., Hsu, JJF, and Hung, D. 2000). Such tools include e-mail,

electronic bulletin boards, chat, teleconference and electronic whiteboard. Chats or video conference are the synchronous communicative tools that enable real time communication while email and electronic whiteboard are the asynchronous communicative tools. E-mail is the most widely used tool on internet as it enables students to connect beyond the physical barrier classroom

e) Collaborative Tools

This is the most widely used tool that makes online collaborative activities such as meetings, discussions, working on a document, information dissemination and various other tasks. Electronic whiteboard is popular with teachers when used in conjunction with a computer and a video projector that produces integrative learning community (Akbaba-Altun, 2006).These technologies provide impulsive information sharing, constructing knowledge and stimulate the personal growth of students (Mona, 2004). Other collaborative tools such as Wireless Application Protocol (WAP) and General Packet Radio Services (GPRS) embedded in micro browser equipped mobile phones or GPRS enabled tablets/ computers and laptops are other ICT tools that can link students in different geographic locations. These tools enable the integrative learning process and exchange of information in a very short span of time. It provides the flexibility for one to one, one to many and many to many communications especially for the online discussion platforms (Lim, Lee & Yang, 2002).

ICT may act as a catalyst in bridging the gap between the existing systems of learning in higher education. Skill based learning through simulation and interactive learning tools are the future of education in India. Today's youth is more inclined towards learning the processes by experiencing it through the digital platforms. Teachers no longer have the physical classroom barriers and they impart knowledge through various interactive techniques.

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