INFORMATION AND COMMUNICATION TECHNOLOGY IN SECONDARY SCHOOLS ADVANTAGES AND DISADVANTAGES

Prof. Mushtaq Ahmed I. Patel[1] and Mohammed Jahangeer Ali[2]

Abstract

The world is fast becoming a global village as a result of the development in information and communication technology. Information and communications Technology (ICT) has the potential to improve all aspects of our social, economic educational and cultural life. ICT has played an important role in formal and non-formal educational settings; ICT is being utilized in every part of life. Education even at school stage has to provide computer instruction. Technology when it fits comfortably with the curriculum or instructional plans of teaching is an indicative of integrated technology. Thus, technology rather than an additional layer in the classroom is embedded within the design of the teacher's lesson plan and the pedagogy.

Keywords: ICT, Integration of ICT.

INTRODUCTION

Education is said to have started as early as the creation of man. It is simply a system through which one generation transfers or imparts the ideals and cultural practices of its society to the next generation in an unending process. The development of any country depends largely on the quality of education.

The traditional classroom environment has been strongly oriented towards a syllabus-based teacher control on class and use textbook resources. In today's world, teachers need to be equipped not only with subject expertise and effective teaching methodologies but also with the capacity to assist students to meet demand of the emerging knowledge- based society with new form of technology to enhance the quality of learning. Modern education is not restricted within the classroom. The recent development of technology has brought out the whole world outside the classroom. The world is fast becoming a global village as a result of the development in information and communication technology. Information and communications Technology (ICT) has the potential to improve all aspects of our social, economic educational and cultural life.

According to Sukanta Sarkar(2012) "(ICTs) are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information. Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical tele communications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation.

The concept of a "Digital Divide" has been around almost as long as ICT has been publicly available. While traditionally it has come to mean a division in society, based on socio-economic factors, this does not 'paint the entire picture'

"Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realising the goals of teaching learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system. These will not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums,

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[1] Professor in Education,DDE, MANUU, Gachibowli, Hyderabad.

[2] Research Scholar (Ph. D), Dept. of Education, MANUU, Hyderabad.

learning management systems, and management information systems."(National Policy on (ICT) In School Education 2012)

The phrase 'information and communication technologies' (ICT) was originally coined by Stevenson (1997) in his report to the United Kingdom government, and promoted by the new National Curriculum documents for the United Kingdom in 2000. Stevenson (1997) described ICT in the context of education as the study of the technology used to handle information and aid communication. Since then, other definitions have emerged that describe ICT as traditional computer applications with the addition of communication tools such as e-mail, chat-rooms and other internet resources. For example, UNESCO provides the following definitions to serve as a guide:

"Information technology (IT) is the term used to describe the items of equipment (hardware) and computer programmes (software) that allow us to access, retrieve, store, organise, manipulate and present information by electronic means. Personal computers, scanners and digital cameras fit into the hardware category. Database storage programmes and multimedia programmes fit into the software category.

Communication technology (CT) is the term used to describe telecommunications equipment, through which information can be sought and accessed, for example, phones, faxes, modems and computers.(UNESCO, 2003, p.7)

In Australia, the Department of Education, Training and Youth Affairs (DETYA) defines information and communication technology as relating to:"those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (eg computers and other devices); software applications; and connectivity (eg access to the Internet, local networking infrastructure, video conferencing). What is most significant about ICT is the increasing convergence of computer-based, multimedia and communications technologies and the rapid rate of change that characterises both the technologies and their use. (DETYA, 2001, p.1)

The recent addition of 'communication' to previous terms such as information technology (IT) emphasises the growing importance placed on the communication aspects of new technologies (Anderson et al., 2002).

The concept of ICT as information-based technology which can be coordinated with other technologies including communications has acquired the status of a structural unit of society (National Council for Accreditation of Teacher Education 2002;UNESCO, 2002). Blurton (2002) broadens this to define ICT as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information" (Blurton, p.1). In education as elsewhere, the term ICT is usually connected with the notions of computer-based hardware and software. The National Council for the Accreditation of Teacher Education (2002, p. 54)

"Computer hardware and software; voice, data, network, satellite and other telecommunications technologies; and multimedia and application development tools; these technologies are used for the input, storage, processing, and communication of information. In teaching and learning, ICT is expected to include the organisation's computer networks through the internet, and dedicated personal computers and associated equipment such as printers, scanners, digital cameras, video and audio software programs, various ICT-enhanced laboratory equipment, and interactive whiteboards in classrooms and laboratories" (Haddad,n.d.).

However, many educational researchers view the computer as the basis of ICT. Ortega (2000), Shelly et al. (2006), and Elston (2007) researchers who state that the potential for computer-based ICT is in the software applications that can gather, process, and communicate information. With developments in technology equipment and communications systems, many studies conceptualise ICT as the computer and the internet. For example, UNESCO (2002) refers to ICT as computer-based equipment including hardware and software, communication networks such as the internet, and communication hardware and software. Shelly, Cashman, Gunter, and Gunter (2006), and Davis and Naumann (1997 p2) concur, adding externalities such as input and output devices and visual display devices. The internet is defined as a computer network that transmits data from one computer or from one network to another via modems, telephone lines, and other communication devices and media (Shelly et al.)

USE OF ICT IN EDUCATION

ICT has played an important role in formal and non-formal educational settings; ICT is being utilized in every part of life. Due to the increasing importance of the computer, students cannot maintain distance from this potential medium

Education even at school stage has to provide computer instruction. Technical knowledge and positive attitude towards this technology are the essential prerequisites for the successful citizens of the coming decades.

ICT can be used to broadcast material, online facility or CD-ROM can be used as sources of information in different subjects.

•To facilitate communication for pupils with special needs.

•To use electronic toys to develop spatial awareness and psycho-motor control.

•To use the online resource like, email, Chat, discussion forum to support collaborative writing and sharing of information.

•To facilitate video-conferencing or other form of Tele conferencing to involve wide range of students from distant Geographic areas.

•For Blended learning by combining conventional classroom learning with E-learning systems

• To process administrative and assessment data.

• To exchange and share ideas -among teachers for the professional growth.

• To carry out internet-based research to enhance, educational process,

Haddad and Draxler (2002- p. 9)," identify at least five levels of technology use in education: presentation, demonstration, drill and practice, interaction, and collaboration. Each of the different ICTs—print, audio/video cassettes, radio and TV broadcasts, computers or the Internet—may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies. On the other hand, networked computers and the Internet are the ICTs that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration.

Radio and television have been used widely as educational tools since the 1920s and the 1950s, respectively. There are three general approaches to the use of radio and TV broadcasting in education:

1) direct class teaching, where broadcast programming substitutes for teachers on a temporary basis;

2) school broadcasting, where broadcast programming provides complementary teaching and learning resources not otherwise available; and

3) general educational programming over community, national and international stations which provide general and informal educational opportunities. The most notable and best documented example of the direct class teaching approach is Interactive Radio Instruction (IRI).This consists of "ready-made 20-30 minute direct teaching and learning exercises to the classroom on a daily basis. The radio lessons, developed around specific learning objectives at particular levels of maths, science, health and languages in national curricula, are intended to improve the quality of classroom teaching and to act as a regular, structured aid to poorly trained classroom teachers in under-resourced schools. (Perraton,H. and C. Creed,2002)

In India, the Indira Gandhi National Open University have made extensive use of radio and television, both for direct class teaching and for school broadcasting, to reach more of their respective large populations (Nwaerondu, N.G. and G.Thompson,2002- p3). In connection with the above study, Patel (2003) mentions that various capacity building programmes like use of SIM, teleconference, radio programme etc. which were extensively carried out in Karnataka under DEP-DPEP, programme of IGNOU. These were also utilised in Orientation and training through distance mode as well as strengthening instructions. Patel and Ansari (2009) also mentioned the transition of use of radio as one-way medium to its usage as interactive media in the form of

radio-conference. Further, Patel and Ansari (2013) have written about use of teleconferencing including, the use of two-way audio and one-way video system, which was adopted by most of states in late 1990's and early 2000's.

Teleconferencing refers to "interactive electronic communication among people located at two or more different places, " There are four types of teleconferencing based on the nature and extent of interactivity and the sophistication of the technology:

1) Audio conferencing; 2) audio-graphic conferencing, 3) videoconferencing; and 4) Web-based conferencing.(Rao, V. Rama,2002)

Teleconferencing is used in both formal and non-formal learning contexts to facilitate teacher-learner and learner-learner discussions, as well as to access experts and other resource persons remotely. In open and distance learning, teleconferencing is a useful tool for providing direct instruction and learner support, minimizing learner isolation. The audio graphic teleconferencing network aims to provide continuing education and academic upgrading.

According to Richmond, Ron (1997) There are three general approaches to the instructional use of computers and the Internet, namely:

1) Learning about computers and the Internet, in which technological literacy is the end goal;

2) Learning with computers and the Internet, in which the technology facilitates learning across the curriculum,

3) Learning through computers and the Internet, integrating technological skills development with curriculum applications,

Learning about computers and the Internet focuses on developing technological literacy. It typically includes:

• Fundamentals: basic terms, concepts and operations

• Use of the keyboard and mouse

• Use of productivity tools such as word processing, spreadsheets, data base and graphics programs

• Use of research and collaboration tools such as search engines and email

• Basic skills in using programming and authoring applications such as Logo or Hyper Studio

• Developing an awareness of the social impact of technological change.

Learning with computers and the Internet technology means focusing on how the technology can be the means to learning ends across the curriculum. It includes:

• Presentation, demonstration, and the manipulation of data using productivity tools

• Use of curriculum-specific applications types such as educational games, drill and practice, simulations, tutorials, virtual laboratories, visualizations and graphical representations of abstract concepts, musical composition, and expert systems

• Use of information and resources on CD-ROM or online such as encyclopaedia, interactive maps and atlases, electronic journals and other references

Technological literacy is required for learning with technologies to be possible, implying a two-step process in which students learn about the technologies before they can actually use them to learn.

However, there have been attempts to integrate the two approaches.

Learning through computers and the Internet combines learning about them with learning with them. It involves learning the technological skills "just-in-time" or when the learner needs to learn them as he or she engages in a curriculum-related activity

As noted in the World Education Report (UNESCO, 1998a), education worldwide is facing a significant challenge in preparing students and teachers for "our future 'knowledge-based' society" during a time when most teachers are not prepared to use ICT and "the majority of existing school buildings, even in the most developed countries, are not equipped to integrate the new information and communication technologies."

According to(Christensen, 2004) that perception of the potential usefulness of the computer could influence attitude towards information technology. The amount of confidence a teachers possess in using information technology may greatly influence their effective implementation in the classroom. Positive teacher attitude towards computers are widely recognized as a necessary condition for effective use of information technology in the class room. (Christensen, 2004).

INTEGRATION OF ICT IN SECONDARY SCHOOLS

Technology when it fits comfortably with the curriculum or instructional plans of teaching is an indicative of integrated technology. Thus, technology rather than an additional layer in the classroom is embedded within the design of the teacher's lesson plan and the pedagogy. Thus, in this approach, the teacher designs learning activities and students use technology to construct their own learning.

The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas to achieve these objectives teachers need to be involved in collaborative project and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. (Vanaja et.al. 2014 p-254)

The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology because, given enough initial capital, acquiring the technology is the easiest part, but curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others, are the most crucial aspects to consider. (infodev pdf Document 2012)

The technology revolution is challenging and redirecting all forms of education, including secondary school education. The incorporation of technology into the teaching and learning process has become an important component throughout all areas of education (Suleiman, 2012).Staff development is most effective when it is individualized. This means, giving opportunity to learn flexibly the contents, the method and at any time. It has been suggested (Christensen, 2004) that computer experience should be provided for pre-service teachers prior to their involvement in teaching. He further argued that teachers trained on ICT are more likely to use the tools personally and in their classroom thereby promoting positive attitude. These training should include strategic plans rather than introducing teacher productivity tools alone (UNESCO, 2002).

Use of ICT in education also affects the way students learning. With the help of technologies it is possible to promote transformation of education from teacher centered to students centered. Use of ICTs provide many opportunities through their provision and support for resource based, student centered learning

The ICT facilities used in the teaching learning process in schools according to (Bandele,2006) and (Bolaji, 2003) include; radio, television, computers, overhead projectors, optical fibres' fax machines, CD-Rom, Internet, electronic notice board, slides, digital multimedia, video/VCD machine and so on. In fact some of the facilities are not sufficiently provided for teaching – learning process in the institutions of learning. Undoubtedly, this might account for why teachers are not making use of them in their teaching.

The impact of educational radio and television broadcasts on the quality of basic education remains an under-researched area, but what little research there is suggests that these interventions are as effective as traditional classroom instruction. (Hannafin.R.D, and S. Savenye, 1993)

Any use of ICT in learning settings can Act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the impact becomes very pronounced .Teachers generate meaningful and engage learning experiences for their students, by strategically using ICT to enhance learning .Students enjoy learning,and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which the world need in their future lives. (Vanaja et.al. 2014 p-255)

ADVANTAGES OF ICT IN EDUCATION

The following Advantages which bring to education

1) General Advantages   2) Advantages for Teacher   3) Advantages for student

1) General Advantages:-

- Greater efficiency throughout the school,
- Communication channels are increased through email, discussion group,
- Use of ICT across different curriculum subjects can have a beneficial motivational influence on students learning,

2) Advantages for Teachers:-

- ICT facilitates sharing of resources, expertise and advice,
- Great facility in where and when task are carried out,
- Gain in ICT literacy skills, confidence and enthusiasm,
- Easier planning and preparation of lessons and designing,
- Access to up to date pupil and school data, any time anywhere,
- Computer use during lesson motivated students to continue using learning outside school hour,

3) Advantages for Students:-

- Higher quality lessons through greater collaboration between teachers in planning and preparing resources,
- More focused teaching ,tolerated to students' strengths and weaknesses, through better analysis of attainment data,
- Development of writing skill, fluency, originality and elaboration,
- Encouragement of independent and active learning, and self responsibility for learning,
- Flexibility of any time any where access,
- Development of higher level learning styles,
- Opportunities to address their work to an external audience,
- Opportunities to collaborate on assignment with people outside or inside school,

DISADVANTAGES OF ICT

One of major barrier for the cause of ICT not reaching its potential in the foundation stage is teacher's attitude. Another important drawback to using ICT is the fact that computers are expensive. There is a lot of incorrect information on the internet students will learn more theory and less practical, Hacking, Creating Viruses, Plagiarism.

REFERENCES

Anderson, N., Baskin, C. and Halbert, M. (2002). Sustaining and supporting professional development in ICT. AARE, Brisbane. [Online] http://www.aare.edu.au/02pap /and 02399. htm [8 August 2013].

Bandele,S.O.(Ed.).(2006). Development of modern ICT and internet system. Abuja: Pan of Press.

Blurton, C. (2002). New directions of ICT: Use in education. UNESCO Report. From http://www.unesco.org/education/educprog/lwf/dl/edict.pdf, Retrieved12February2013

Bolaji, O. A., Babajide. (2003). Perception of lecturers and service teachers towards the use of communication media in teching pure and applied science related disciplines. Paper presented at the 44 Annual STAN Conference.

Christensen, R. (2004). Effect to technology integration education on the Attitude of the teachers and their students, www.text.edu/researchdissert html. accessed 2 June 2014

Davis, G., & Naumann, D. (1997). Personal productivity with information technology. New York, NY: McGraw-Hill.

DETYA (2001). Information and communication technology for teaching and learning. Department of Education, Training and Youth Affairs. Schooling Issues Digest. [Online] http://www.dest.gov.au/NR/rdonlyres/C251724A-1E09-4954-BFBEFDA5836375E3/4508   /technology .pdf [8 Nov 2013].

Elston, C. (2007). Using ICT in the primary school. London, England: Paul Chapman Publishing.

Haddad, W.D. (n.d.). ICTs for education: a reference handbook. Retrieved 26 July 2013 from www.ictinedtoolkit.org.

Haddad,W&Drexler,A.(2002),"Technologies for Education: Potentials,Parameters and Prospects (Washington DC: Academy for Educational Development : UNESCO), p.9

Hannafin, R.D., and S. Savenye. (1993),"Technology in the Classroom :The Teacher's New Role and Resistance to It, in Educational Technology, 33 (6), 26-31.

National Policy on ICT in School Education (2012),Department of School Education and Litracy MHRD Government of india 2012 access 15 july 2014

(NCATE) (2002).United States' National Council for Accreditation of Teacher Education

Professional standards for the accreditation of schools, colleges, and departments ofeducation 2002. Retrieved 19 July, 2014 from http://www.ncate.org

Nwaerondu, N.G. and G.Thompson,"The Use of Educational Radio in Developing Countries:Lessons from the Past" ;available from http://www.clrec.org/nwaeronduthompson; accessed 3 May 2014,

Ortega, M. (2000). Computers in education:The near future.In M. Ortega & J. Bravo (Eds.),Computers and education in the 21st century. Boston, MA:Kluwer Academic Publishers.

Patel, M. I. (2003), IGNOU-NCERT-Collaborative Project (Sponsored by MHRD) – *Distance Education Initiatives in DPEP (DPE) Karnataka,* IGNOU, New Delhi.

Patel, M. I. (2009), *Scope of Radio Programmes and Role of Radio Phone-In Conference in Capacity Building – A Case Study of Karnataka State* in Technology-mediated Learning for Professional Development of Personnel at Elementary Education Level, DEP-SSA, IGNOU-MHRD, New Delhi.

Patel, M. I., (2013), *Teleconference as a means of Interactive Training of in-service teachers* in Conflux-Journal of Education, Vol., 1, Issue 5;

Perraton, H. and C. Creed,"Applying New Technologies and Cost-Effective Delivery Systems in Basic Education"; available from http://unesdoc.unesco.org/images/ 0012/001234/12348 2e.pdf; accessed 31 May 2014.

Rao,V. Rama,"Audio Teleconferencing—A Technological Prescription for Interactive Learing"; available from http://www.clrec.org/rama; accessed 14 August 2014.

Richmond, Ron. Integration of Technology in the Classroom: An Instructional Perspective. SSTA Research Centre Report #97-02; available from http://www.ssta.sk.ca/research/ technology/ 97-02.htm#BIBLIOGRAPHY; accessed 30 October 2013.

Shelly, G., Cashman, T., Gunter, G., & Gunter, R. (2006). Integrating technology and digital media in the classroom: Teachers discovering computers (4th ed.). Boston, MA: Thomson Course Technology.

Stevenson, D. (1997). The Independent ICT in Schools Commission, Information and Communications Technology in UK Schools: An Independent Inquiry (http://web.archive.org/web/20070104225121/http://rubble.ultralab.anglia.ac.uk/Stevens/ICT.pdf),1997.Impact noted in Jim Kelly, What the Web is doing for Schools (http://specials.ft.com/lifeonthenet/FT3NXTH03DC.html), Financial Times, 2000.

Sukanta Sarkar(May 2012) . The Role of Information and Communication Technology in Higher Education for the 21st Century,(The Science Probe Vol. 1 No. 1 Page No- 30-41)

Suleiman, A. A. (2012). ICT acceptance and use in teaching and learning among academic staff in Indian universities. Presented at BERA 2012 conference, university of Manchester,

UK 5th September, 2012. http://www.leeds.ac.uk/educol/documents/211681.pdf.

UNECSO(1998a).World Education Report 1998: Teachers and teaching in a changingworld(Summary)[OnLine].Paris:Author.URLhttp://www.unesco.org/education

UNESCO, (2002). An innovative Approach to Adult lifelong learning, www.unescobkk.org.

UNESCO, (2002). Information and communication technology in education: A curriculum for schools and programme of teaching development. Paris, France:

UNESCO. (2003). Developing and Using Indicat ors of ICT Use in Education. UNESCO Asia and Pacific Regional Bureau for Education: Bangkok.

Vanaja.M,Dr ,S.Rajasekar ,S.Arulsamy (2014).Information and Communication Technology in Education: NeelKamal Publication Hyderabad,

www.infodev.org/en/Document.431.pdf, Last accessed on 23 July 2012,