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REVIEW ARTICLE

ROLE OF ICTs IN EDUCATION

*Dr. B. Radhika

School of Distance Education, Andhra University, Visakhapatnam-530 003

ARTICLE INFO	ABSTRACT
	Today, from the time we awaken in the morning to the time before we sleep, we are surrounded by media, such as newspapers, radio, television, cellular phones, computers. Sometimes we are not even aware that we are surrounded by these media. All these media come under the overall umbrella of what we known as today's ICTs. Knowing and using ICTs is important in today's fast changing knowledge society, but we very often are confused about what these media are. ICT's stand for Information and Communication Technologies. "ICT in Education" means Teaching and learning with ICT. ICTs are often spoken of in a particular content, such as ICT, in Education, Health care, or libraries. ICTs refer to technology that provides access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on Communication Technologies. This includes the Internet, Wireless Networks, Cell phones and other communication mediums.

INTRODUCTION

What is e-learning?

Although most commonly associated with higher education and corporate training, e-learning encompasses learning at all levels, both formal and non-formal, that uses an information Network—the Internet, an intranet (LAN) or extranet (WAN)—whether wholly or in part, for course delivery, interaction and/or facilitation. Others prefer the term online learning. Web-based learning is a subset of elearning and refers to learning using an Internet browser (such as Netscape or Internet Explorer).

What is blended learning?

Another term that is gaining currency is blended learning. This refers to learning models that combine traditional classroom practice with e-learning solutions. For example, students in a traditional class can be assigned both print-based and online materials, have online mentoring sessions with their teacher through chat, and are subscribed to a class email list. Or a Web-based training course can be enhanced by periodic face-to-face instruction. "Blending "was prompted by the

*Corresponding author: Dr. B. Radhika,
School of Distance Education, Andhra University, Visakhapatnam-530 003.

recognition that not all learning is best achieved in an electronically-mediated environment, particularly one that dispenses with a live instructor altogether. Instead, consideration must be given to the subject matter, the learning objectives and outcomes, the characteristics of the learners, and the learning context in order to arrive at the optimum mix of instructional and delivery methods. This method is very useful in Education.

What is open and distance learning?

Open and distance learning is defined by the Commonwealth of Learning as "a way of providing learning opportunities hat is characterized by the separation of teacher and learner in time or place, or both time and place; learning that is certified in some way by an institution or agency; the use of a variety of media, including print and electronic; two-way communications that allow learners and tutors to interact; the possibility of occasional face-to-face meetings; and a specialized division of labour in the production and delivery of courses.

What is meant by a learner-centered environment?

The National Research Council of the U.S. defines learner-centered environments as those that "pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring with them to the classroom." The impetus for learner-

centeredness derives from a theory of learning called constructivism, which views learning as a process in which individuals "construct" meaning based on prior knowledge and experience. Experience enables individuals to build mental models or schemas, which in turn provide meaning and organization to subsequent experience. Thus knowledge is not "out there", independent of the learner and which the learner passively receives; rather, knowledge is created through an active process in which the learner transforms information, constructs hypothesis, and makes decisions using his/her mental models. A form of constructivism called social constructivism also emphasizes the role of the teacher, parents, peers and other community members in helping learners to master concepts that they would not be able to understand on their own. For social constructivists, learning must be active, contextual and social. It is best done in a group setting with the teacher as facilitator or guide.

Delivery systems

Based upon their characteristics, media technologies can be grouped into Two categories, namely, synchronous and asynchronous. Synchronous media enquire all participants to be together at the same time even though in different locations. Synchronous ICTs allow for participants in the learning process to be at "different times" and different places"

Types of Media/ICT Technologies used in Education

Synchronous Media	Asynchronous Media
Audio-graphics Audio conferencing, as in a telephone conference Broadcast radio and television Teleconferencing Computer conferencing such as chat and Internet telephony	Audio and video tapes and CDs E mail Computer file transfers Virtual conferences Multimedia products, off line Web based learning formats

How can ICTs help expand access to education?

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

Anytime, anywhere

One defining feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).

Access to remote learning resources

Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at anytime of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons—mentors, experts, researchers, professionals, business leaders, and peers—all over the world.

Strengths and Weaknesses of ICTs

Like all innovations that we have come to accept, ICTs also have strengths and weaknesses. We should list these because it is important to know what they are especially if we are to plan and use them effectively. Some of the strengths of the ICTs include

Individualization of learning: This means that people learn as individuals and not as a homogenous group. ICTs allow each individual to relate to the medium and its content.

Interactivity: Interactivity is the way in which a person can relate to the content, go forward and backward in the content, start at any point depending upon prior knowledge instead of always in a sequential way.

Low per unit cost: Per person, ICTs reduce the cost of education from very high to very low.

Distance and climate insensitive: It does not matter where you are, or how the weather is, you can still access and learn from ICTs.

Can serve multiple teaching functions and diverse audiences: ICTs, especially the computer and Internet based can be useful in drill and practice; to help diagnose and solve problems, for accessing information and knowledge about various related themes.

High speed delivery, wide reach at low cost: There is instant delivery of information.

Uniform quality: If content is well produced and is of good quality, the same quality can be delivered to the rich and the poor, the urban and the rural equally and at the same low cost. But ICTs also have weaknesses which we must understand. Some of these include

High infrastructure and start up costs: It costs money to build ICT systems and to maintain them.

Tend toward centralized uniform content in economies of scale: The larger the numbers, the lower the cost. This means that sometimes we try to reach large numbers so we make

content common, not taking into account individual differences.

Are not ideally location and problem sensitive: Address problems in a general way, but
cannot, without special effort, solve local and culturally sensitive problems.

Problems of reach, access, remain: Not everyone has equal access; so not everyone benefits equally from the use of ICTs.

Tend to create new class of knowledge rich/knowledge poor: Those who have access and knowledge through the media become richer and those who do not become poorer, widening the "knowledge or digital gap" between rich and poor.

Essentially delivery systems: A medium is different from the content; and often we forget that we can deliver any content, because ICTs are essentially meant only to deliver content, not to change attitudes or bring about behavior change.

Hard to assess impact: Learning from ICT delivered content is difficult to assess since such learning is of a multidimensional and long term kind, rather than from immediate learning assessment as in a classroom test.

Officers, trainers need reorientation and retraining: Just as people learn to use ICTs, trainers and officers also need training - something they sometimes resent.

Call for attitudinal change to understanding of teaching and learning: These are different media and have a different way of teaching from what we are accustomed to— therefore, they need different ways of understanding what teaching and learning is all about And so, they are a mixed bag and it is necessary that we recognize both their strengths and weaknesses, before planning to use them in our adult learning setup. It is more important that we recognize because if we use a technology thinking it to be ideal one, but not recognizing its limitations, we are likely to fail in our effort and then to believe that all ICTs are useless and inadequate in education.

Limitations of ICT use in education as related to student behavior

1. Computers limit students imaginations.
2. Over - reliance on ICT limits student's critical thinking and analytical skills,
3. Students often have only a superficial understanding of the information they download,
4. Computer-based learning has negative physical side-effects such as vision problem,
5. Students may be easily distracted from their learning and may visit unwanted sites,
6. Students tend to neglect learning resources other than the computer and internet,
7. Students tend to focus on superficial presentations and copying from the internet,
8. Students may have less opportunity to use oral skills and hand writing,

9. Use of ICT may be difficult for weaker students, because they may have problems with working independently and may need more support from the teacher.

The other limitation of ICT use in education is technology related. The high cost of the technology and maintenance of the facilities, high cost of spare parts, virus attack of software and the computer, interruptions of internet connections, and poor supply of electric power are among the technology related limitations of ICT use in education.

Summary

This review article attempts to answer questions on the roles of ICTs in education, existing promises, limitations and the challenges of its integration in education systems. Information communication technologies are influencing all aspects of life including education. They are promoting changes in working conditions, handling and exchanging of information, teaching-learning approaches and so on. One area in which the impacts of ICT is significant, is education. ICTs are making major differences in the teaching approaches and the ways students are learning. ICT-enhanced learning environment facilitates active, collaborative, creative, integrative, and evaluative learning as an advantage over the traditional method. In other words, ICT is becoming more appropriate in the realization and implementation of the emerging pedagogy of constructivism that gives greater responsibility of learning for students. Several surveys are showing that ICT use in education systems of developed nations has comparatively advanced than ICT use in education systems of developing nations. In addition, the major promises of ICTs use in education systems of developing countries focus on training teachers in new skills and introducing innovative pedagogies into the classrooms, investing on ICT infrastructure for schools and creating networks among educational institutes, improving overall standard of education by reducing the gap in quality of education between schools in urban and rural areas, initiation of smart school with objectives to foster self-paced, self assessed, and self-directed learning through the applications of ICTs, and developing ICT policy for education and training.
On the other hand, this article discusses the major limitations of ICT use in education as teacher related, student related, and technology related. In addition, the key challenges of ICTs integration into education systems discussed relate to policy, planning, infrastructure, learning content and language, capacity building and financing.

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