

## The Role of Information and Communication Technologies (ICTs) in Higher Education



### Education

**KEYWORDS :** Higher education, ICT, Globalization

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### ABSTRACT

*Since time immemorial, education has been an important instrument for social and economic transformation. In this era of globalization and hyper-competition, there is a need for a transformation in the higher education that will help to make the learning that is imparted current and relevant. It is indeed a commonly agreed and accepted priority that Higher Education in India, which is a traditionally managed, lacking relevant and quality education, needs total revamping. The true revolution in higher education will come from its digitization. During the past few decades, ICT has provided society with a vast array of new communication capabilities and has fundamentally changed the way life now. In the current environment-conscious world, the importance of education and acceptability of ICT as a social necessity has been increasing. Social acceptability of information and communication tools is necessary to improve the mobility in the society and increase the pitch for equity and social justice. Education as a qualitative development is not confined within the classroom structure. In India, within education in general and higher education in particular, ICT has begun to have a presence, but the impact has not been as extensive as in other fields. Experiments and experiences show that there are three broad dimensions to achieve optimally ICT integrated higher education, namely, Percolation ICT culture in higher education; The growth and development of ICT literacy and skill; and ICT supported higher educational management. This paper throws more light on impacts of ICT in higher education system, explores potential future developments and suggests adoption of suitable strategies*

### Introduction

Education is the backbone of a nation. Despite knowing this, a huge number of people of least developed countries are far beyond the reach of higher education. One of the key reasons may be the poor economic condition of those countries. Perhaps this is the crucial challenge to be addressed by those nations for overall development where education may be on the top list. Information, Knowledge, and Communication Technology also play vital role in the growth as well as producing and offering goods and services at relatively reduced costs. Smart use of ICTs can process information, create knowledgebase and make them available wherever and whenever necessary. But despite having relatively poor economic condition, Information and Communication Technologies (ICTs) in most cases have tremendous success in providing services at reduced costs to the people's door steps. ICTs have the same to do for making the higher education available to all classes of people throughout the country at a lower cost. As a result, on one hand people will have the access right on higher education and on the other hand will gain the necessary knowledge, skills, and experiences to serve the nation and prosper accordingly.

In 21st century, one can hardly find a country where higher education through distance mode is not available. In fact it has been practiced since long before. But at present days, having revolution of ICTs, the higher education through distance mode has been more practical and well accepted by the all people around the globe. It is now being called Virtual learning. In developed country, people are getting more interested in learning through Virtual Campus. Virtual Campus is nothing but ICT enabled campus, where students are attending their classes, discussing with teachers, accessing learning resources, seating exams, joining forums/clubs, submitting assignments etc virtually having the facility of real-time interactions between teacher and students.

### Definition of terms

**ICTs:** ICTs stand for Information and Communication Technologies. According to Blurton, C ICT is defined as "diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information". Technologies included in ICTs are: Radio and Television (broadcasting technology), Telephony, Computers, and the Internet.

**WWW:** WWW stands for World Wide Web which is one of the most important and widely accepted services (like IRC, E-Mail etc) of the Internet. Its popularity has increased dramatically, simply because it's very easy to use, colorful, and rich in content. "Web is a series of interconnected documents stored on computer sites or websites" (Dennis P Curtin et al (2002)).

**E-Learning:** 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 also term it as online learning.

**E-Payment:** Making payment electronically. E-payment is a subset of an e-commerce transaction to include electronic payment for buying and selling goods or services offered through the Internet. Generally we think of electronic payments as referring to online transactions on the internet, there are actually many forms of electronic payments – Credit Card, Digital Check, E-Cash etc.

**E-Business:** E-Business means interaction with business partners, where interaction is enabled by information technology. E-Business is changing the way we do business. For example, communicating with partners via e-mail, e-brochure, webpage etc.

**Group discussion:** Internet Relay Chat (IRC) is among the popular Internet service people mostly use for live chatting. Group of people with common interest can exchange views/opinions with each other instantly through Internet. Description of the internet technologies required to support higher education via ICTs (WWW, Video Conference, Tele-Conference, Mobile-Conference, CD, Database, Word processor, Intranet, Internet etc)

**E-Modules:** Modules written are converted and stored into digital version into a computer using word processor accessible by the user through Internet.

**Trust and Security:** Existence of six main components of a commerce site suggests trustworthiness as 1) Seals of Approval 2) Brand 3) Navigation (The ease of finding what the visitor seeks) 4) Fulfillment 5) Presentation Design attributes that suggest quality and professionalism) and 6) Technology. As for security there are also six issues to look into: 1) Integrity, 2) No repudiation (prevention against any one party from reneging on an agreement after the fact), 3) Authenticity (authentication of data source), 4) Confidentiality (protection against unauthorized data disclosure), 5) Privacy (provision of data control and disclosure) and 6) Availability (prevention against data delays or removal)

**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.

**Audio conferencing:** Involves the live (real-time) exchange of voice messages over a telephone network. When low-bandwidth text and still images such as graphs, diagrams or pictures can also be exchanged along with voice messages, then this type of conferencing is called audio-graphic. Non-moving visuals are added using a computer keyboard or by drawing/writing on a graphics tablet or whiteboard.

**Videoconferencing:** Allows the exchange not just of voice and graphics but also of moving images. Videoconferencing technology does not use telephone lines but either a satellite link or television network (broadcast/cable).

**Web-based conferencing:** As the name implies, involves the transmission of text, and graphic, audio and visual media via the Internet; it requires the use of a computer with a browser and communication can be both synchronous and asynchronous.

**ICT enabled Education: an Overview**

The Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. When such technologies are used for educational purposes, namely to support and improve the learning of students and to develop learning environments, ICT can be considered as a subfield of Educational Technology. ICTs in higher education are being used for developing course material; delivering content and sharing content; communication between learners, teachers and the outside world; creation and delivery of presentation and lectures; academic research; administrative support, student enrolment etc.

In the current information society, people have to access knowledge via ICT to keep pace with the latest developments. In such a scenario, education, which always plays a critical role in any economic and social growth of a country, becomes even more important. Education not only increases the productive skills of the individual but also his/her earning power. It gives them a sense of well being as well as capacity to absorb new ideas, increases their social interaction, gives access to improved health and provides several more intangible benefits. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes and CD ROMs have been used in education for different purposes (Bhattacharya and Sharma, 2007).

**The Four Rationales for Introducing ICT in Education**

Rationale	Basis
Social	Perceived role that technology now plays in society and the need for familiarizing students with technology.
Vocational	Preparing students for jobs that require skills in technology.
Catalytic	Utility of technology to improve performance and effectiveness in teaching, management and many other social activities.
pedagogical	To utilize technology in enhancing learning, flexibility and efficiency in curriculum delivery.

**Source: Cross and Adam (2007)**

Today ICTs - including laptops wirelessly connected to the Internet, personal digital assistants, low cost video cameras, and cell phones have become affordable, accessible and integrated in large sections of the society throughout the world. It can restructure organizations, promote collaboration, increase democratic participation of citizens, improve the transparency and responsiveness of governmental agencies, make education

and health care more widely available, foster cultural creativity, and enhance the development in social integration. It is only through education and the integration of ICT in education that one teaches students to be participants in the growth process in this era of rapid change. ICT also allows for the creation of digital resources like digital libraries where students, teachers and professionals can access 6 ICT in Higher Education: Opportunities and Challenges research material and course material from any place at any time (Bhattacharya and Sharma, 2007). Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work.

**Distance Learning**

It is a type of education, where students work on their own at home or at the office and communicate with faculty and other students via e-mail, electronic forums, videoconferencing, chat rooms, instant messaging and other forms of computer-based communication. It is also known as open learning. Most distance learning programs include a computer based training(CBT) system and communications tools to produce a vital classroom. Because the Internet and World Wide Web are accessible from virtually all computer platforms, they serve as the foundation for many distance learning systems. 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. Such facilities allow the networking of academics and researchers and hence sharing of scholarly material and leads to quality enhancement in teaching and learning.

Stakeholder	Benefits
Students	<ul style="list-style-type: none"> <li>• Increased access,</li> <li>• Flexibility of content and delivery,</li> <li>• Combination of work and education,</li> <li>• Learner-centered approach,</li> <li>• Higher-quality of education and new-ways of interaction.</li> </ul>
Employers	<ul style="list-style-type: none"> <li>• High quality, cost effective professional development in the workplace,</li> <li>• Upgrading of employee skills, increased productivity,</li> <li>• Developing of a new learning culture,</li> <li>• Sharing of costs and of training time with the employees,</li> <li>• Increased portability of training.</li> </ul>
Governments	<ul style="list-style-type: none"> <li>• Increase the capacity and cost effectiveness of education and training systems,</li> <li>• To reach target groups with limited access to conventional education and training,</li> <li>• To support and enhance the quality and relevance of existing educational structures,</li> <li>• To ensure the connection of educational institutions and curricula to the emerging networks and information resources,</li> <li>• To promote innovation and opportunities for lifelong learning.</li> </ul>

**Source: UNESCO, 2002.**

**Conclusion**

The increasing use of information and communication technologies (ICTs) has brought changes to teaching and learning at all levels of higher education systems (HES) leading to quality enhancements. Traditional forms of teaching and learning are increasingly being converted to online and virtual environments. There are endless possibilities with the integration of ICT in the education system. The use of ICT in education not only improves classroom teaching learning process, but also provides the facility of e-learning. ICT has enhanced distance learning. The teaching community is able to reach remote areas and learners are able to access qualitative learning environment from anywhere and at anytime. It is important that teachers or trainers should

be made to adopt technology in their teaching styles to provide pedagogical and educational gains to the learners. Successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipment. ICT enabled education will ultimately lead to the democratization of education.

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