ICT IN HIGHER EDUCATION

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Abstract

Since time immemorial, education has been an important instrument for social and economic transformation. Presently higher education in India is experiencing a major transformation in terms of access, equity and quality. This transition is highly influenced by the swift developments in information and communication technologies (ICTs) all over the world. The introduction of ICTs in the higher education has profound implications for the whole education process especially in dealing with key issues of access, equity, management, efficiency, pedagogy and quality. At the same time the optimal utilization of opportunities arising due to diffusion of ICTs in higher education system presents a profound challenge for higher educational institutions. In this backdrop, the paper addresses the opportunities and challenges posed by integration of ICTs in various aspects of higher education in the present scenario.

1. Introduction

Higher education systems have grown exponentially in the last five decades to meet the demands of quality education for all. This aspect has further gained momentum due to swift advancements in Information and Communication Technology (ICT). Demand for skilled and

competent labor is ever increasing in the contemporary globalized society. In this backdrop, access to quality in higher education for all has emerged as determining factor of economic growth and development. In order to increase the access to higher education and improving its reach to the remotest parts of the country contribution of open and distance learning facilities is on the increase. In addition, it is catering to life-long learning aspirations and that too at affordable cost. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. Even then the challenge to develop a higher education system that is flexible and dynamic so as to holistically integrate the technology in the management and delivery of learning programmers is daunting. The first section presents briefly the present profile of higher education in India. Role of ICTs in higher education and the areas in which they can be integrated to play prominent role are discussed in the second section. The final section explores the challenges in expanding the role of ICTs for future development in higher education.

2. 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 counseling, interactive voice response system, audiocassettes and CD ROMs have been used in education for different purposes (Bhattacharya and Sharma, 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 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.

In view of ICT, education can be classified in three main categories:

- E-learning
- Blended Learning
- Distance Learning

2.1 E-Learning

E-Learning or Electronic learning is a general term used to refer to computer-enhanced learning. It is commonly associated with the field of advanced learning technology (ALT), which deals with both the technologies and associated methodologies in learning using networked and/or multimedia technologies. It is also known as online learning. Distance education provided the base for e-learning's development. E-learning can be 'on demand'. It overcomes timing, attendance and travel difficulties. E-learning allows delivery, dialogue and feedback over the

internet. It allows mass customization in terms of content and exams. E-education can provide access to the best gurus and the best practices or knowledge available (UNESCO, 2002). It is possible to leverage the online environment to facilitate teaching techniques like role-play across time and distance. It can also facilitate the development of scenarios, which can be rarely witnessed in practice. ICT can play a valuable role to monitor and log the progress of the students across time, place and varied activities.

E-learning allows higher participation and greater interaction. It challenges the concept that face-to-face traditional education is superior to it (Bhattacharya and Sharma, 2007). The web and the internet is the core ICTs to spread education through e-learning. The components include e-portfolios, cyber infrastructures, digital libraries and online learning object repositories. All the above components create a digital identity of the student and connect all the stakeholders in the education.

E-learning has the following advantages:

- Eliminating time and geographical barriers in education for learners as well as teachers.
- Enhanced group collaboration made possible via ICT.
- New educational approaches can be used.
- It can provide speedy dissemination of education to target disadvantaged groups.
- It offers the combination of education while balancing family and work life.
- It enhances the international dimension of educational services.

2.2 Blended Learning

Blended learning is the combination of multiple approaches to learning. It is usually used to define a situation where different delivery methods are combined together to deliver a particular course. These methods may include a mixture of face-to-face learning, self-paced learning and online classrooms.

2.2.1 Face to face learning

It refers to learning that occurs in a traditional classroom setting where a faculty member delivers instruction to a group of learners. This could include lectures, workshops, presentation, tutoring, conference and much more.

2.2.2 Self-paced Learning

It provides the flexibility to learn according to the availability of learners' own time and pace, it occurs in a variety of ways such as: reading specific chapters from text book, studying course material presented through web-based or CD based course, attending pre-recorded classes or sessions, reading articles referred by faculty member, working on assignments & projects, and searching & browsing the internet.

2.2.3 Online Collaborative Learning

It involves interaction between learners and faculty members through the web; this interaction can occur in one of the following modes:

- Synchronous interaction.

- Asynchronous interaction.

Synchronous, means 'at the same time', it involves interacting with a faculty member and other learners via the web in real time using technologies such as virtual classrooms and / or chat rooms. On the other hand, Asynchronous means 'not at the same time'; it enables learners to interact with their colleagues and faculty member at their own convenience, such as interacting through email.

2.3 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.

3. Benefits of ICT in education to the main stakeholders

Table 1: *Benefits to Stakeholders*

Stakeholder	Benefits
Students	- Increased access, - Flexibility of content and delivery, - Combination of work and education, - Learner-centred approach, - Higher-quality of education and new-ways of interaction.
Employers	- High quality, cost effective professional development in the workplace, - Upgrading of employee skills, increased productivity, - Developing of a new learning culture, - Sharing of costs and of training time with the employees, - Increased portability of training.
Governments	- Increase the capacity and cost effectiveness of education and training systems, - To reach target groups with limited access to conventional education and training,

Source: UNESCO, 2002.

4. Role of ICT in Higher Education

Swift growth of ICTs is taking place all over the world. They have emerged as powerful tools for diffusion of knowledge and information. Their introduction and unprecedented use in the higher education has generated varied response. The opportunities can be categorized as the aspects relating to role of ICT for access and equity in education, their role in pedagogy for quality learning and teaching at higher education level and in inducing innovations in approaches and programs.

5. Access and Equity in Higher Education

Presence of ICT in education sector is increasing steadily. In spite of the fact that education is a social enterprise and teachers are the traditionally mainstay of teaching learning process, ICTs are very powerful tool for diffusing knowledge and information, a fundamental aspect of the education process. ICTs can play enormous role for improving access and equity in education sector in general and higher education sector in particular.

11th Plan proposed to achieve the target of 15 percent GER by 2012 through the increase in institutional capacity and increase in 'intake capacity' of existing educational institutions. These efforts are also experiencing the push created in this direction through the consistent rise in enrolment at elementary level and secondary level. The demand for higher education is expected to rise steeply in the forthcoming years under these influences. ICTs lend themselves as an ideal mechanism to bridge this gap by complementing both formal education system as well as distance learning systems (Neeru, 2009).

E-learning is emerging as an important strategy to provide widespread and easy access to quality higher education. E-learning is a generic term referring to different uses and intensities of uses of ICTs, from wholly online education to campus-based education and through other forms of distance education supplemented with ICTs in some way. Although, presently the initiatives for development of e-learning in India are continuing in a sporadic manner, UGC is advocating and making efforts to enhance the quality of higher education by framing policy guidelines for their integration in classroom and other activities.

6. Role of ICTs in Pedagogy for Quality Teaching Learning

Another most important dimension of higher education sector influenced by ICT integration is improving quality of teaching-learning. Also, the changes taking place due to globalization and internationalization attach premium to knowledge and information. Therefore, the integration of ICTs would not only help in promoting personal growth but also in developing "knowledge societies". The call of the hour is the need to provide education for everyone, anywhere, and anytime. Life-long learning has become the driving force to sustain in the contemporary competitive environment. Therefore to strengthen and / or advance this knowledge-driven growth, new technologies, skills and capabilities are needed.

Conventional teaching-learning processes are undergoing a paradigm shift. Focus of instruction is now on education programs/practices that promote competency and performance. Such curricula tends to require access to variety of information sources, information forms and types; student centered learning settings based on information access and inquiry; learning environments centered or problem-centered and inquiry-based activities, authentic settings and examples; and teachers as coaches and mentors rather than content experts (Neeru, 2009). The shift towards development of educational programs is well supported by and encouraged by the emerging instructional technologies.

Apart from enhancing student's learning experience, role of ICTs in capacity building/training of educational personnel has very large potential. National level institutes can provide leadership role in enhancing technical and managerial manpower in different disciplines through ICT networks and collaborations. Technology facilitated learning would result in preparation of staff regarding innovative pedagogic methods, new ways of learning and interacting, easy sharing of new practices among teaching community and result in widening the opportunities for their participation. The capabilities of competent and trained teachers/academic experts can be made available to larger audiences/students through flexible and virtual settings.

7. Potential Drawbacks-cum-Challenges to Using ICT in Education

While using ICTs in education has some obvious benefits, ICTs also bring challenges. First is the high cost of acquiring, installing, operating, maintaining and replacing ICTs. While

potentially of great importance, the integration of ICTs into teaching is still in its infancy. Introducing ICT systems for teaching in developing countries has a particularly high opportunity cost because installing them is usually more expensive in absolute terms than in industrialized countries whereas, in contrast, alternative investments (e.g. buildings) are relatively less costly (UNESCO, 2009).

7.1 The four most common mistakes in introducing ICTs into teaching are:

- Installing learning technology without reviewing student needs and content availability.

- Imposing technological systems from the top down without involving faculty and students.

- Using inappropriate content from other regions of the world without customizing it appropriately.

- Producing low quality content that has poor instructional design and is not adapted to the technology in use. (UNESCO, 2009).

Although ICT offers a whole lot of benefits there are some risks of using ICT in education which have to be mitigated proper mechanisms. They are:

- It may create a digital divide within class as students who are more familiar with ICT will reap more benefits and learn faster than those who are not as technology savvy.

- It may shift the attention from the primary goal of the learning process to developing ICT skills, which is the secondary goal.

- It can affect the bonding process between the teacher and the student as ICT becomes a communication tool rather than face to face conversation and thus the transactional distance is increased.

- Also since not all teachers are experts with ICT they may be lax in updating the course content online which can slow down the learning among students.

- The potential of plagiarism is high as student can copy information rather than learning and developing their own skills.

- There is a need for training all stakeholders in ICT.

- The cost of hardware and software can be very high.

8. 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. 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. The nature of change, which the integration of the ICT promotes in pedagogical organization, affects not only the teacher but also the student. Both are required to interact in different environments and subjects, to share knowledge, to build new relationships, to build and break down information, rebuilding it within new spaces, in differentiated meanings and with new forms of organization.

It is worth emphasizing that ICT activity may cause radical change in the teacher's activity as well as in that of the student. However, the real evolution lies in the change of educational culture: a culture of collaborative learning, seeking to overcome the individualistic matrix through social action, whether it be from the perspective of interaction or representation. In this field, there is still much to be done within the culture of the universities. 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 any time. 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.

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