ICT IN HIGHER EDUCATION

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"The principle goal of education is to create men who are capable of doing new things, not simply by repeating what other generations have done." - Jean Piaget, Cognitive psychologist

Destiny of a nation is shaped in its educational institutes, as education is the key to human progress and social change. Universities are institutions of excellence to promote the best values and to provide leadership to the educated world and the society at large. They are harbingers of ideas and idealism. **Sam Pitroda , chairman of National Knowledge Commission** said "*Higher education has been key to India's growth in the last couple of decades, and it was all thanks to the country's founding fathers, who recognized the role higher education would play.*"

Relevance of what **Kothari Commission said in 1966** is still greater today: no reform is more important and more urgent than to transform education, to Endeavour to relate it to the life, needs and aspirations of the people and thereby make it a powerful instrument of social, economic and cultural transformation necessary for realization of our national goals. This can be done if education is related to productivity and strengthens social and national integration; if it consolidates democracy as a form of government and helps the country to adopt it as a way of life; if it hastens the process of modernization and strives to build character by cultivating social, moral and spiritual values.

In our country, the 10+2+3 pattern advocated by the Kothari Commission is presently being adopted by all the states and the NPE (1986) reaffirms it. The accelerated economic growth leading to demand for skilled manpower and to enhance competitiveness in a globalised

economy has made the **higher education** sector a priority sector today. The higher education system in India comprises of more than17000 colleges, 20 central universities, 217 State Universities, 106 Deemed to Universities and 13 institutes of National importance. This number will soon inflate as the setting up of 30 more central universities, 8 new IITs, 7 IIMs and 5 new Indian Institutes of Science are now proposed.

Higher education institutions throughout the world are in a period of rapid change, as *"Changes occurring in the primary processes of higher education courses and degree granting are closely related to the contextual trends of virtualization, internationalization, lifelong learning and customer orientation that are part of society in general"* (Collis & Moonen, 2001, p. 30). In this context, traditional universities have no choice but to significantly alter their instructional methods to keep pace with developments spurred by the Internet. Thus, adopting and adapting to **"the technology of the 21st century"** is unavoidable for everyone in society and in particular in the educational context (Ali, 2003; Collis & Moonen, 2005).

ICT: A PARADIGM SHIFT

Evaluating the history of ICTs in education from the period of 1981 to the current age has seen the educational use of computers developing from standalone data processors in computer labs, through to accessing the Web, to being able to provide integrated Web services for teaching and learning, resource collections, student records, administration, professional development and community relations now. (Gerry, 2005)

Information technology refers to:

- Sharing and interchanging information such as knowledge, mental skills, motor skills and attitudes through the use of mass media especially electronics.

- Achieving success in this sharing and interchanging through communication which consist of receiving (hearing or seeing); accepting as nothing can change unless information is accepted and getting some action, i.e., change in behavior

Information and Communication Technologies (ICTs) is a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information. This broad definition of ICT includes technologies as radio, television, video, DVD, telephone, satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail (UNESCO, 2002).

ICT is potentially a powerful tool for extending educational opportunities and can provide remote learning resources. It encourage students to take responsibility for their own learning and offers problem centered and inquiry based learning which provides easy access and information based resources. It is necessary to acquire the ability to use technology as a tool to research, organize, evaluate and communicate information and the possession of the fundamental understanding of the ethical or legal issues and use of information

ICT revolution has given rise to **'learning economy'** wherein the capability to learn how to create new knowledge and adapt to changing conditions determines the performance of individuals, institutions, regions, and countries (Lundvall & Borras 1999). This has fuelled the demand for e-learning both at organisational and educational sector. *E-learning is defined as learning facilitated and supported through the utilization of information and communication technologies (Jenkins and Hanson 2003).* Thus, e-learning includes use of ICTs (viz. Internet, computer, mobile phone and video) to support teaching and learning activities.

"E-Learning is an ideal learning environment using modern means of information technology, through the effective integration of information technology and the curriculum to achieve, a new learning style which can fully reflect the main role of the students to thoroughly

reform the traditional teaching structure and the essence of education, to train large numbers of high quality personnel. (Ma, Wang, & Liang, 2008, p. 54)"

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The ICT Policy in higher education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and global competitiveness. The introduction of ICT in the higher education has profound implications for the whole education process ranging from investment to the use of technologies in dealing with key issues of access, equity, management, efficiency, pedagogy and quality.

- ***Laptops, mobile phone*** are gadgets that are taking the place of textbooks and libraries. The internet connectivity has brought in a revolution in the minds of even babies. Education has taken a significant overhauling with technological advances being widely used in effective teaching and mentoring. ***Distance education*** is easier these days as laptops and internet connectivity have given the Universities faster means of reaching more students in real time.

- ***Visual learning*** is extremely effective in learning. PowerPoint presentations made by teachers and also students being asked to create one to be graded later. Animated videos are made and shared to explain a concept. Video conferencing can be used as a tool to have an interactive learning VOIP (voice over internet protocol) based softwares like **Skype, Google talk Google Docs, wikis** etc support video conferencing. **Podcasts** of classroom notes are downloaded to listen as students commute. Universities are making these podcasts available to their students.

- ***Online learning*** is where the tutor and students in different parts of the globe come together for a virtual class at an appointed time. In real time, they share an interactive whiteboard, where pictures, animated videos, PowerPoint presentations can be shared for effective and engaging teaching. Audio and video is possible along with a chat board in the sidebar. eg. **Wiziq**

- ***Web 2.0 tools*** promote a social, collaborative and sharing approach to learning. Integration of various internet tools effectively is necessary for effective education. Teaching professionals and learners use their favourite tools to create, present, store information in different formats. Tests/quizzes are taken and graded online and shared online too. Online assignments are generated quickly according to the specifications given by the teacher.eg. **Flickr, iGoogle, Slideshare**

The impact of ICT on *what* is learned

Conventional teaching has emphasized content. For many years course have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favoring curricula that promote competency and performance. Curricula are starting to emphasis capabilities and to be concerned more with *how* the information will be used than with *what* the information is.

Competency and performance-based curricula

The moves to competency and performance-based curricula are well supported and encouraged by emerging instructional technologies (Stephenson, 2001). Such curricula tend to require:

- access to a variety of information sources;
- access to a variety of information forms and types;
- student-centred learning settings based on information access and inquiry;
- learning environments centred on problem-centred and inquiry-based activities;
- authentic settings and examples; and
- Teachers as coaches and mentors rather than content experts.

Information literacy

The growing use of ICTs as tools of everyday life have seen the pool of generic skills expanded in recent years to include information literacy and it is highly probable that future developments and technology applications will see this set of skills growing even more.

The impact of ICT on *how* students learn

Just as technology is influencing and supporting what is being learned in schools and universities, so too is it supporting changes to the way students are learning. Through technology-facilitated approaches, contemporary learning settings now encourage students to take responsibility for their own learning. The growing use of ICT as an instructional medium is changing and will continue to change many of the strategies employed by both teachers and students in the learning process.

Student-centered Learning:

ICT provides a technology that has the capacity to promote and encourage the transformation of education from a teacher directed enterprise towards student-centered models. As more and more students use computers as information sources and cognitive tools, the influence of the technology will increase to support their studies.

Supporting Knowledge Construction:

Learning approaches using contemporary ICTs provide many opportunities for constructivist learning and support for resource-based, student centered settings by enabling learning to be related to context and to practice.

Cross-boundaries learning:

Information available online, uploaded by learners and teachers across the globe allows everyone to know and learn about the cross cultural beliefs.

The impact of ICT on *when* and *where* students learn

In the past educational institutions have provided little choice for students in terms of the method and manner in which programs have been delivered. ICT applications provide many options and choices and many institutions are now creating competitive edges for themselves through the choices they are offering students. These choices extend from when students can choose to learn to where they learn

Anyplace Learning:

With the help of ICT, educational institutions can offer programs at a distance mode. Today many students can use this facility through technology-facilitated learning settings.

Anytime Learning:

Technology-facilitated educational programs remove the geographical barriers. Students are able to undertake education anywhere, anytime and at any place. This flexibility has provided learning opportunities for many more learners who previously were constrained by other commitments.

Emerging Challenges

While considering the opportunities associated with ICT enhanced education it can be said that ICT-enhanced education is better than a simple education, but there are many challenges, which hamper the exploration and exploitation of its opportunities. In view of integrating ICTs in education have following key challenges:

- ***ICT Infrastructure****:* The main challenge for ICT-enhanced education is the availability of information and communication technologies infrastructure. Before any ICT-based program is launched, policymakers and planners must ensure the availability of the followings: appropriate rooms or buildings to house the technology, computers as well as affordable Internet service for on line learning, radio, television, computers, overhead projectors, optical fibers, fax machines, CD-Rom, Internet, electronic notice board, slides, digital multimedia, video/VCD machine and availability of electricity and

telephone. In developing countries like ours large areas are still without a reliable supply of electricity and the nearest telephones are miles away.

- ***Language and Content:*** English is the dominant language of the Internet. An estimated 80% of online content is in English. A large proportion of the educational software produced in the world market is in English. For developing countries like ours where English language proficiency is not high, especially outside metropolitan areas, this represents a serious barrier in maximizing the educational benefits of the World Wide Web. Content development is a critical challenge as the bulk of existing ICT- based educational material is likely to be in English.

- ***Teachers with ICT Skills:*** Lack of teachers equipped with ICT skills is another problem for the use of ICT in education. This new development is a strong indication that the era of teachers without ICT skills are gone. Any classroom teacher with adequate and professional skills in ICT utilization will definitely have his students perform better in classroom learning. Teaching and learning has gone beyond the teacher standing in front of a group of students and disseminating information to them without the students' adequate participation (Ajayi, 2008)

- ***Cost of Education:*** The costs associated with the development of high quality technology-facilitated learning materials are quite high. Compared to traditional forms of off-campus learning, technology-facilitated learning has proven to be quite expensive in all areas of consideration, infrastructure, course development, appointment of qualified teachers and course delivery.

Conclusion

Information and communication technologies are a major factor in shaping the new global economy and producing rapid changes in society. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They have the

potential to transform the nature of education-where and how learning takes place and the roles of teachers and students in the learning process.

The National Policy on Education 1986, as modified in 1992, stressed upon employing educational technology to improve the quality of education. The policy statement led to two major centrally sponsored schemes, namely, Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) paving the way for a more comprehensive centrally sponsored scheme – Information and Communication Technology @ Schools in 2004. Use of ICT for quality improvement also figures in Government of India's flagship program on education, Sarva Shiksha Abhiyan (SSA). Again, ICT figured comprehensively in the norm of schooling recommended by Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005

Integration of ICT in higher education is inevitable. In the coming years the thrust will be on the use of ICT to strengthen the system in the mode of opens and distance learning. Institutional and sector-wide higher education ICT policy and planning should identify the specific role of ICT in enhancing research capabilities and provide for adequate infrastructure backed by capacity building. Digital libraries, access to online databases, networking etc. can be enhanced through inter-institutional collaboration to ensure optimal usage of ICT expertise and resources. EDUSAT and DTH should be promoted, wherever feasible, to enhance access to information and resources. A broadcast Server for digital storage, retrieval and transmission of broadcast quality educational audio-video programmes should be deployed. Digital libraries, access to online databases, networking, etc. can be enhanced through inter-institutional collaboration to ensure optimal usage of ICT expertise and resources. The wide adoption of ICT calls for mindsets and skill sets that are adaptive to change. Though higher education institutes in developed countries

Therefore, Let us all pledge to make India a knowledge superpower, a knowledge-based society enabling us to leapfrog in finding new and innovative ways. Let us scientifically meet the

challenges of building a just and equitable social order. Let India stand with honour and glory among the comity of nations in the knowledge millennium.

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