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ICT in Higher Education: Opportunities and Challenges

Dr. D. Hassan

Assistant Professor, Department of Education, Acharya Nagarjuna University, Ongole Campus, Ongole.

KEYWORDS :

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 labour is ever increasing in the contemporary globalised 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.

Institutions

At the end of X Plan (31.03.2007), there were 363 Universities (20 Central, 229 State, 109 Deemed and 5 Institutions under Special State Legislature Acts) and 21,170 colleges in the country. At the end of the third year of XI Plan (2009-10), the number of Universities has gone up to 493 (42 Central, 130 Deemed and 316 State Universities and 5 Institution established under Special State Legislature Acts) and the number of Colleges to 31,324, thus registering an increase of 36% in the number Universities and 48% in the case of Colleges in comparison to the figures at the end of X Plan. The type-wise number of universities and colleges as on 03.03.2010 is indicated in the Table 1.

Table 1: Type-wise number of University/University-Level Institutions and Colleges as on 31.03.2010

Sl. No.	Type of Institutions	Number of Institutions (As on 31.03.2009)	Number of Institutions (As on 31.03.2010)
1.	Central Universities	40	42
2.	State Universities	231	256
3.	State Private Universities	21	60
4.	Institutions established through State Legislation	5	5
5.	Institutions Deemed to be Universities	128	130
	Total	425	493
6.	Colleges	25,951	31,324

Source: Annual Report 2009-10, UGC

Students Enrolment

Enrolment in higher education has registered a steep hike in the last sixty years. During the academic year 2009-10, there had been 146.25 lakhs (provisional) students enrolled in various courses at all levels in universities/colleges and other institutions of higher education as compared to 136.42 lakhs in the previous year, registering an increase of 7.2 percent. Out of 146.25 lakhs, 60.80 lakh had been women students, constituting 41.6 percent. This rapid expansion of higher education, however, hides the story of the severe disparities that prevails in access to higher education across the states. Different states are at different stages of development. There are states wherein the access ratio to higher education is much lower than the national average of about 20%. As against this, there are 14 states wherein the access ratio is higher than the national average. It is evident from the available statistics that of the total enrolment in higher education, 86% students are enrolled in undergraduate programs, 12% in postgraduate programs, 1% in diploma / certificate programs and 1% are enrolled in research programs. It shows a highly 4 ICT in Higher Education: Opportunities and Challenges skewed picture of higher education. The size of the post graduate education as also that of research is a matter of great concern. The situations of diploma and certificate level programs, which constitute only 1% of the higher education, leave much to be desired.

Growth in Enrolment of Women in Higher Education

There had been a phenomenal growth in the number of women students enrolled in higher education, since independence. The women enrolment which was less than 10 percent of the total enrolment on the eve of Independence had risen to 41.6 percent in the academic year 2009-2010. The pace of growth has been particularly faster in the last two decades. As the data in Table 2 shows that the number of women enrolled per hundred men registered almost five times in 2009-2010 as compared to 1950-1951.

Table 2: Women Students Per Hundred Men Students

Year	Total Women Enrolment (000s)	Women Enrolment Per Hundred Men
1950–51	40	14
2009–10	6080	71

The above statistics reveal that out higher education system is so large. However, higher education is featured by many weaknesses today. They include continuation of the legacy of British system, over politicization of the higher education sector, mushrooming of institution, lack of leadership, mismatch between enrolment and infrastructure, overcrowding of classrooms, lack of motivation on the part of teachers and the students, rigidity in subject combinations, inappropriate recruitment policy relating to teachers, implementation of policies without sufficient preparation, poor efficacy of co-curricular and extra-curricular activities, the contradictions between the ruled and the reality, government shirking its responsibility for providing necessary financial support, etc. It is felt that higher education is not yet higher in India.

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.

Table 3: 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. In view of ICT, education can be classified in three main categories:

- E-learning
- Blended Learning, and
- Distance 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 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.

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.

Face to face Learning 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.

Self paced Learning 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.

Online Collaborative Learning 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.

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.

Table 4 : Benefits of ICT in education to the main 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, · To support and enhance the quality and relevance of existing educational structures, · To ensure the connection of educational institutions and curricula to the emerging networks and information resources, · To promote innovation and opportunities for lifelong learning.

Source: UNESCO, 2002.

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 programmes.

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 par-

ticularly 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).

The four most common mistakes in introducing ICTs into teaching are

i) Installing learning technology without reviewing student needs and content availability;
ii) Imposing technological systems from the top down without involving faculty and students;
iii) Using inappropriate content from other regions of the world without customizing it appropriately;
iv) 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:

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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