ABSTRACT

The rapid development of Information and Communication Technology (ICT) has changed many aspects of human life. ICTs stand for Information and Communication technologies and are defined as a diverse set of tools and resources which are used for the purpose of communication as well as for the purpose of creation, dissemination, storage and management of information.

ICT is playing an important role in today’s world and education is no exception. Use of ICT for promotion of education and development has always formed an integral part of the Indian policy and plan documents on education. The Indian Government has taken a number of measures at both the primary and higher education levels. The draft education policy of 1986, which was further, modified in 1992 laid emphasis on the role of ICT in promoting economic development. Several schemes have accordingly been adopted.

ICT can play an important part from the view point of three agencies: teachers, students and government. If implemented correctly ICT can help in the acquisition of 21st century skills. ICT in India has a number of challenges, in the form of infrastructural challenges, teacher related challenges, capacity building challenges, technology support challenges and language content challenges.

India has a number of problems such as poverty. Illiteracy, language and health issues. ICT is definitely an engine of growth. It has to be propelled properly and the impending problems solved. Otherwise the ICT Revolution will be more a dream rather than a reality.

Keywords: ICT; Digital; e-Education; Distance Learning

INTRODUCTION

One of the most fascinating features of today’s information age is the rapid development of Information and Communication Technology, particularly the internet. Information and Communication Technology (ICT) has changed many aspects of the way we live. The transformation has been enormous in fields such as medicine, tourism, travel, business, law, banking, engineering and architecture. In case of education, the change has been far less. This Paper attempts to look into the concept of ICT in general and with reference to education in particular, the state of ICT in India, examine the role of the ICT in higher education, discuss the challenges confronting the sector and briefly dwell on the future of ICT in India.

OBJECTIVES OF THE STUDY

The current study is based on the following objectives:
1. ICT is playing an important role in the development of a country and therefore it is imperative that we understand the concept;

2. We try to understand the role of ICT in the economic progress of a nation and the situation existing in India;

3. To examine the constraints and challenges confronting the Indian economy and see what best can be done for the future.

**Concept of ICT**

ICTs stand for Information and Communication technologies and are defined as a diverse set of tools and resources which are used for the purpose of communication as well as for the purpose of creation, dissemination, storage and management of information. It is inclusive of computers, the internet, broadcasting technologies (radio and Television) and telephony.

ICT can be referred to as collection of technological gear and resources which are largely used for the purpose of communication. One can divide ICT as:

a) Telecommunications systems and network: This consists of cellular, broadcast, cable, satellite, postal.

b) The networks that utilize them: This involves the hardware and software of information collection, storage, processing and presentation.

Educational technology has become an important part of today’s technology. It includes various types of media that deliver text, audio, video, images, animation, streaming videos and is inclusive of technical applications and processes such as audio or video tape, satellite TV, CD-ROM and computer based learning.

In short, it can be said to be referring to physical hardware as well as educational theoretics. E technology is used, for the tools that technologically or electronically support teaching and learning.

**ICT in India**

The emergence of ICT has fundamentally changed every phase of human behavior. India, with a population of over 1 billion, has to her credit one of the largest young population in the world. The demand for higher education has increased by leaps and bounds, as she has a number of challenges in terms of infrastructure, socio-economic and physical barriers. ICT can transform the education scenario, but the question that emerges is whether its benefits would reach the common masses?

Use of ICT for promotion of education and development, has always formed an integral part of the Indian policy and plan documents on education. The Indian Government has implemented several national as well as state specific schemes that run parallel to large number of privately led initiatives, at both the elementary and higher education levels.

India, internationally well-known for her prowess in the software sector, is making use of a combination of ICTs such as open source software, satellite technology, local language interface, digital libraries etc. with the objective of reaching the remotest of rural area.

The draft National Policy on Education in 1986 and further modified in 1992 lay emphasis on employing Education Technology for improving the quality of higher education. The Policy Goals as mentioned in the Policy are:

1. To create an environment for the development of ICT knowledgeable economies in the states;

2. Creation of an ICT literate community who can utilize the benefits from ICT and thereby contribute to building of the nation;
3. To create an environment of co-operation, collaboration and sharing for creating a demand which would in the long run optimally utilize the returns generated by ICT both in schools and higher education;

4. Promotion of universal, equitable, open and free access to ICT enabled tools and resources to the entire student community;

5. Promoting development of localized quality content and also enabling students and teachers to partner in the development and critical issues of shared digital resources;

6. To promote the development of professional networks of teachers, continuing education of teachers, guidance, counseling and academic support to students;

7. Promotion of research, evaluation and experimentation in ICT tools and practices so as to inform, guide and critically use the potentials of ITC in higher education;

8. To motivate and enable wider participation of all sections of society in strengthening education through appropriate use of ITC.

In 2000 Gyan Darshan was launched to broadcast educational programs for school kids, university students and adults. Similarly Gyan Vani was another important step which broadcast programs contributed by Indira Gandhi Open University (IGNOU) and IITs. In addition under the UGC country wide classroom initiative, education programs are broadcast on Gyan Darshan and Doordarshan every day. In 2005 E-Gyankosh, a knowledge repository was launched and 95% of IGNOU’s printed materials have been digitized and uploaded on the repository.

In 2009 the government approved the landmark “National Mission on Education” through ICT Scheme. This Mission Scheme caters to the learning skills of 500 million people in the country.

In addition one can mention the following notable achievements in the application of ICT to India:

a) IGNOU makes use of radio, TV and internet technology;

b) National Program on technology Enhanced Learning, which uses internet and TV to promote distance learning;

c) Eklavya initiative uses internet and TV to promote distance learning;

d) IIT Kanpur has developed ‘Brihaspati’ open source e-learning platform (Virtual Classroom).

e) National Program on Technology Enhanced Learning (NPTEL) for enhancing the quality of engineering education through provision of free online courseware, started by the IITs and IISc

f) Under the N-List program of INFLIBNET, Lakhs of e-books and thousands of high quality e-journals are made available to colleges and universities with the objective of inculcating research culture among the teachers and students.

g) IIT Mumbai has started the program of CDEEP (Centre for Distance Engineering Education Program) for classroom interaction through the use of real time interactive satellite technology (Center for Distance Engineering Education Program, India 2007)

However, a survey conducted by the UGC in 2008 shows that the penetration of the ICT system is very poor, in case of majority of Indians living in the rural areas have poor access to internet. In today’s world it is very essential that they are trained in basic computing skills and ICT utilization.

Role of ICT in Higher Education in Economic Development

ICT plays an important role in the economic development of a country. ICT has opened up options of part-time and distance learning schemes. It can overcome obstacles such as cost, faculty crunch, poor quality of education, time and distance barriers. It is a fact that ICT can provide greater reliability,
validity and efficiency in the collection of data. As the modern world is now leaning more and more towards digital media, the role of ICT in education is gaining more and more importance.

One can look at the benefits from the point of view of 1) Teachers, 2) Employers and 3) Government. Let us examine them.

**Students**
- They are provided with increased access;
- Flexibility is generated in the delivery of content;
- It provides scope for combining work with education;
- ICT facilitates a learner-centered approach and
- It improves the quality of education while simultaneously facilitating new ways of interaction.

**Employers**
- It makes possible high quality cost effective professional development;
- ICT helps in upgrading the skills of the employees and thereby enhances their productivity;
- It makes way for development of new learning cultures;
- It enables sharing of costs and training with the employees;
- ICT provides greater scope for training.

**Government**
- It helps in increasing the training and cost effectiveness of education and training systems;
- To reach target groups who have limited access.
- To support and enhance the quality and relevance of existing educational structures;
- To ensure connectivity of educational institutions and curricula to the emerging networks and information resources;
- To provide for innovations and opportunities in life-long learning.

If used creatively ICT will not only make a big difference in the way of teaching-learning process but also help in the assimilation of 21st century skills like digital literacy, innovative thinking, creativity, sound reasoning and effective communication. It can also help in improving the quality of education through blended learning, by supplementing the traditional chalk and talk method.

ITC enabled education can also be a solution to the growing demands for enrolments in higher education in India and thereby help in improving the Gross Enrolment Ratio (currently at 12% which is well below the world average of 23%). ICT will be even more beneficial in case of distance education, where ICT can pave the way for the creation of Virtual Classrooms. In addition ICT can help in the management and governance of educational institutions.

As ICTs provide new ways of accessing information, it brings about a change between the students, as also between the students and the teachers. The digital source of information has the potential to influence the content of the curricula, as it makes available information which was earlier inaccessible. Besides ICT enables teachers to have more interactive discussions, in the classrooms on subject related as well as current problems, and thereby paves the way for authentic learning experiences.
Challenges to the ICT Sector

It is undoubtedly true that the in keeping with the initiatives taken by the Governments, both Central and State, there has been a lag between the actually projected program and the harsh reality. Let us discuss the various challenges encountered as under:

1) Infrastructure related Challenges: India has certain infrastructural constraints in the form of small size of classrooms, frequent power interruptions, non-availability of Television sets and at times technicians for their maintenance, sub-standard quality of hardware or software or proper e-content. This would deter the dissemination of knowledge.

2) Teacher-related Challenges: There would be need for changing the mode of thinking of teachers from being generators of knowledge to being facilitators of knowledge. The teachers have to be more pragmatic in application and competent in handling the computer. There is also a general belief among the teachers, that the computer would totally replace them leading to a sort of resistance to the implementation of the digital revolution in education technology. All these fears can be allayed, if teachers are given training in the use of the new tools and steps taken to remove the wrong notions they have in their mindset.

3) Capacity building Challenges: Training teacher-educators for ICT interventions is a two-way process involving pre-service training and in-service training. The need is for pedagogical training rather than training in the use of ICT tools. Teachers should be oriented about their own responsibilities and encouraged to upgrade their skills further.

4) Technology support related Challenges: One major challenge is lack of technical support facilities in higher educational institutions. ICT enabled teaching learning depends on many factors such as deployment and of technology, installation, operation and maintenance of different equipment, network administration and network security etc.

5) Language and content related challenges: India is characterized by a heterogeneous population speaking different languages and consequently it follows that courses have to be made in different languages. According to the 2011 Census, 68.84% of the population stays in rural areas and majority of them do not speak English. Most of the web-based resources are in English which our people will not be able to comprehend.

It is therefore essential to focus on develop the educational content in regional languages as well as in English.

Future of ICT in India

As we have seen the challenges of ICT are multi-faceted, a multi - pronged approach is required. At the outset one must remember that unless reforms in teaching, curriculum, and assessment are carried out simultaneously with use of instructional technology, the whole effort would be meaningless.

Educational technology may be a good solution for some instructional problems and in some cases may only be a partial solution. Therefore it is necessary, to identify those situations where educational technology is appropriate. Because it may happen that education technology would offer solutions to problems which are difficult, cumbersome or simply difficult to resolve under the given circumstances.

To enable the creation of a healthy ICT environment it is essential that we develop collaborative networks together with a common centralized repository for e-journal, digitized PhD thesis, research papers, e-books etc.

The Indian education system is showing enhanced interest in imparting ICT based teaching right from the grass root level. With just the right spirit and policy implementation the dream of written examinations and assessments be ICT based would be realized.
CONCLUSION

On the basis of the above discussion, one can safely say that ICT is a weapon for progress. It is essential that we integrate our age hold knowledge system with the ICT strategies. This calls for development of a need based software.

The future of e-education in India is bright. The process has commenced. But as we have seen there are plenty of challenges. India has to first overcome the problems of poverty, illiteracy, language barriers and health issues, in order to provide effective e-learning throughout the country. The point to be remembered is that, the ICT Revolution will only remain a dream that, instead of propelling the economy will further marginalize the disadvantaged sections of the society, if efforts are not made to tackle the major constraints.

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