REVIEW ARTICLE

IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON HIGHER EDUCATION IN INDIA

*Chandra Shekhar Singh

Department of Sociology, Dayalbagh Educational Institute, Deemed University, Agra (U.P.)

ABSTRACT

It is said that "knowledge is power". In the case of our nation which was once known for its grand status of "Vishwa Guru" is again ready to emerge as knowledge super power in the world by transforming our population into knowledge enabled working population. The gradual process of human socialization takes place by the affection of parents and interaction with society. In this process, education plays a very vital role and transforms a biological man who is guided by instincts into a sociological man who is known for his thoughts and culture. With the modernization of our society, when every nook and corner is being guided by Information and Communication Technology (ICT), then "Education" which is known as the biggest socializing and modernization guiding factor cannot remain untouched with the blessings of this technology. It is a bitter fact that our country is facing the challenges of inadequate technology access and inequity coupled with economic considerations and technological know-how. So, emergence of ICT can be seen as a practical solution which has created a drastic change in almost every field including business, governance and education and its miracle has enabled the world to move forward very rapidly towards digital media. So, its role in the enhancement of education has become increasingly important. In the present 21st century the use of ICTs in education and its related activities like research and others are watching an unprecedented growth. This transformation can be termed as a revolution and seen in the form of a boom which has changed the pattern of disseminating education in today's era. The changes are not only in the form of dissemination but it can be seen in the betterment of interaction pattern and communication skill with the students and vice versa. The main idea behind this paper is to find out the role of ICT in education sector in our country with an assessment of its impact on students and teachers which has facilitated the growth of interactive learning in higher education with social effectiveness.

INTRODUCTION

With the emergence of Information and Communication Technology (ICT), every aspect of human life has seen a drastic change whether it is business, governance or education. In the year 2011, when the world witnessed the birth of 7 billionth person, and our nation touched the population mark of 1.2 billion, a revolution in the field of ICT was witnessed in every arena of life. The developing nations of the world including India which was having a very big proportion of youth, the demand for education saw a boom and it was considered as a very strong bridge of social, economic and political mobility. In our country ICT was considered to revolutionise the transformation of education sector which was suffering from various challenges such as infrastructure, socio-economic, linguistic and physical barriers for people who were trying to change their destiny with the sword of education. ICT was considered as a boon in the field of higher education and its emancipatory and transformative potentials has surely helped in increasing the higher education requirement of nation by part time and distance learning schemes.It was also proved beneficial by overcoming the cost issues, less number of teachers, poor quality of education and in addition it has overcome time and distance barriers. The education system based on Information & Communication Technology (ICT) is able to provide greater reliability, validity and efficiency of data collection. It was very helpful by easing the analysis, evaluation and interpretation at any educational level. As the world was enjoying the adventurous advantages of digital media, so in the same way its role in educational system becomes increasingly important. It has transformed the way how knowledge is disseminated today in terms of teacher's interaction and communication with the students and vice-versa.

Role of ICT in changing the teacher-student interaction: With the help of ICT, the role of teacher can be seen as:

Corresponding author: **Chandra Shekhar Singh,**
Department of Sociology, Dayalbagh Educational Institute, Deemed University, Agra (U.P.)

(i)   Learning facilitator.
(ii) Collaborator, coach and mentor
(iii) Knowledge navigator and co-learner.
(iv) Teacher gives students more options and responsibilities for their own learning.

In the same way the role of students has also seen unprecedented changes whichare appended below:

(i)   Active participation in the learning process.
(ii) Producing and sharing of knowledge.
(iii) Collaborative learning with others.

So, it can be said that the application of ICT in the field of education has been proved very beneficial both for students and teachers besides employers and government. In addition, it can also be harnessed for multiple purposes such as increasing the capacity and cost effectiveness of education and training systems and enhance the quality of higher education. During the last two decades ICT has fundamentally changed the basic shape of working of education.The present era of 21st century is having a great demand of integration of ICT in Indian universities and colleges and there is an aim of acquisition of ICT skills as part of core education system. In order to fulfill this goal, the Government of India has formulated the National ICT policy, which is being implemented through vigorous activities of National Informatics Center (NIC) and encouragements form University Grants commission (UGC), All India council of Technical Education (AICTE) and Department of Science & Technology (DST) throughout the country. ICT has played a very powerful role in changing many educational practices of higher education and enabled both students and teachers to gain access to technology, direct communication and enhanced the capability of quality learning.

Review of Literature

1. Niyaz Ahmed (Aug 01, 2011), in his paper: Effective educational management: An implication of ICT in administration of higher education institutions" states that the use of ICT in educational management will benefit analyzing of data quickly and provides the administrative power for efficient management of education.
2. J. Meenakumari & Dr. R. Krishnaveniin their study (2011) in "Transforming higher educational institution administration through ICT" has identified a comprehensive set of functional area of e-administration.
3. Savita Desai, Prashant Shah (June 2005), in their research study on "The role of ICT in administration, Teaching, learning and evaluation & Research in higher education" identified different activities when ICT can be utilized in administration of colleges.
4. Susan Methan K (2011), in her study "Impact of information communication technology (ICT)" on professional development and educational needs of library professional in Universities of Kerala reveals that most of library professionals have an positive approach towards the application of ICT bases service in library.

Objective of the study

(i)   To determine the role being played by ICT in Higher education, research field and institutional effectiveness.
(ii) To determine the inspiration by ICT for making an innovativesociety.
(iii) To determine the challenges being faced by ICT in higher education and their probable solutions.

Emergence of Information & Communication Technology (ICT) in Higher Education:With the growth of technology, ICT has spread its tentacles in Indian education system at a very fast pace. The use of satellite in education started as Satellite Instructional Television Experiment (SITE) in 1975-76. This led to the establishment of CIET-SIET studios for production and transmission of school oriented programs, initiation of the country-wide classroom of the UGC with CEC as the nodal agency by creating educational media resource centers (EMRCs) and audio-visual resource centers (AVRCs) in several universities. Presently these programmers‟ are continuing as Vyas Channel supported by the CEC and various EMRCs, Gyandarshan II of the IGNOU, Open School and NCERT broadcast channel. EDUSAT was conceptualized to meet the communications requirements of the education sector. It was expected that EDUSAT would bring both quantitative and qualitative revolution in education. However, the quantitative expansion appears to have been achieved in being able to reach out to large numbers, yet the qualitative revolution envisioned due to introduction of new services and better quality teaching with learning materials, has not been quite visible (Bhatia, 2009). Many fruitful steps are taken by various universities like Indira Gandhi National Open University (IGNOU) which are using radio, television, and internet technologies. An Eklavya initiative uses Internet and television to promote distance learning. IIT-Kanpur has developed „Brihaspati‟, an open source e-learning platform (Virtual Class Room). And Premier institutions like IIMCalcutta have entered into a strategic alliance with NIIT for providing programmes through virtual classrooms. Jadavpur University is using a mobile-learning centre. IIT-Bombay has started the program of CDEEP (Centre for Distance Engineering Education Program) as emulated classroom interaction through the use of real time interactive satellite technology. ERNET & EDUSAT (GSAT-3) systems provide support to Tele-education system of Distance learning to reach the un-reached people of India in every nook and corner. INFONET and CEC (Consortium for Educational Communication) services of University Grants Commission supporting E-content, E-learning and E-course systems. Information and Library Network (INFLIBNET) Centre is an Autonomous Inter-University Centre (IUC) of University Grants Commission (UGC) involved in creating infrastructure for sharing of library and information resources and services among Academic and Research Institutions (Neerusnehi 2009). ICT has enabled E-learning which has many advantages and they are appended below:

- 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.

Types of ICT devices in the classroom: Now a day, many devices are being used to impart quality education at all the levels. Some of them are appended below:

1. **Use of computers:** Computers and related gadgets such as iPad or tablets are being used by teachers to assign work to students and for illustrating visual related subjects for making the lesson very easy and accessible for students. In addition, the use of internet explorer by students and teachers has broadened their learning capacity and awareness.
2. **Class websites and blogs creation:**
The word Press and other content management software are used by teachers to create class blogs to post assignments. If the school has no website sever to host these class blogs, the teacher can use free website hosting services like wordpress.com or blogger.com. Via these platforms, the teacher will create a blog under a sub domain of that host. For example, matchclass.wordpress.com, so students will find all academic assignments via that blog. It is very easy to manage and post data to a blog, because they have simple HTML editors.
3. **Utilization of digital microphones:**
Often the big classrooms suffer from endless noise, so in order to sort out this problem teachers have started using wireless digital microphones. These are very affordable devices and can transmit the voice to the loud speakers to enable every student to hear clearly. The same device can be used for asking questions by students and there is no need to strain the voice by teachers.
4. **Use of smart phones and mobile learning:**
Use of smart phones by students and teachers has enabled the facility of mobile learning which is very much similar to e-learning or long distance education. M-Learning is very convenient and accessible as students can access academic information like assignments via an educational mobile application (APP). The biggest advantage of this facility is that it can be done in the classroom or outside the classroom.
5. **Smart Interactive whiteboards:**
Teachers are now using smart interactive white boards having touch screen function. With this the teacher displays visual images by using projector. They get operated by commercial power supply and can be proved very beneficial in saving time.
6. **Effective utilization of online media:**
The modernization of electronic media has enabled the teachers and students to use online streaming media in the classroom and with the help of projector, computer, internet and a white board. They are displaying a real time example using sites like Youtube.com. It can be used for academic reference.

Benefits of Information and Communication Technology on society: The advantages and benefits of ICT in every arena of life can be cited by taking the examples of students, employers and government and they are appended below:

For Students

- Increased access.
- Learner centered approach.
- Combination of work and education.
- Higher quality of education and new ways of interaction.

For Employers

- High quality, cost effective professional development in work place
- Upgrading of employee skills, increased productivity
- Developing of a new learning culture
- Sharing of costs and training time with the employees
- Increased portability of training

For Government

- 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.

Innovative steps by ICT in Higher Education in India: It is beyond doubt that ICT has been proved as a boon in the field of higher education and our country has reaped a lot by taking some very fruitful initiative steps in terms of content delivery and furthering education. There are many examples which can be cited to prove this. Such as in the year 2000, Gyan Darshan was launched. The main idea behind the launching of GyanDarshan was to broadcast educational programmes for school kids, university students and adults. Further, GyanVani was another step for broadcasting programmes contributed by IGNOU and IITs. Under the UGC country wide classroom initiative, education programs are broadcast on GyanDarshan and Doordarshan's National Channel (DD1) every day. E-Gyankosh which aims at preserving digital learning resourcesis a knowledge repository was launched by IGNOU in 2005. Almost 95% of IGNOU's printed material has been digitized and uploaded on the repository. The National Programme for Technology Enhanced Learning (NPTEL) launched in 2001 is another joint initiative of IITs and IISc which promotes education through technology. Moreover, the ambitious National Mission on Education through ICT was launched by the government to harness ICT's potential throughout the length and breadth of the country. In 2009, the government approved the landmark "National Mission on Education through ICT" scheme. The National Mission on Education through ICT is centrally sponsored scheme submitted by the Ministry of HRD and approved by the Cabinet Committee on Economic Affairs (CCEA). The Mission has planned a variety of initiatives aimed at developing and standardizing digital content for Indian higher education segment. The Mission envisions catering to the learning needs of 500 million people in the country.

Role of ICT in changing Society: During the last two decades, ICT in higher education has emerged as a very crucial factor in the enhancement of quality and in turn for economic and societal development. Higher education system has taken many initiatives in addressing social issues like poverty, inequality, gender, environment and empowerment of marginalized section of society. In addition to its vital role in education sector, ICT in current business world has added the economic value to the nation and played its part in development of society. The business from software development to travel agency and the insertions of new occupations like IT developers; IT assistant etc. the generation of new business and employments will generate the economy, reduces unemployment and enhances the standard of living of society. It is only the miracle of ICT, that people across the world are connected through various media like telephones, mobiles, emails and social networks etc and the dream of global village has now become true.

Challenging Factors Affecting Utilization of ICT in Higher Education: In our country, ICT has played a very crucial role in the betterment of higher education. But it is also a burning issue in today's era that ICT is suffering from many challenges and problems. Many literary issues are continuously projecting that ICT can play much bigger role in improving India's higher education by providing greater equity, better access and improved quality. In the year 2008, a survey was conducted by UGC on accredited colleges and it was found that percolation and penetration power of ICT in higher education is far from satisfactory due to poor infrastructure and many things can be done to improve the situation. Majority of our population residing in the rural areas have poor access to internet, so it is very much essential to improve their exposure and training on basic computing skills in order to reap the real benefit of ICT. According to the International Telecommunication Union; The Internet and Mobile Association of India (IAMAI) report a majority of government institutions do not have sufficient IT systems. As our nation is blessed with multilingual culture, so the development of content in many languages will surely enhance the ICT applications. According to the 2011 Census the rural-urban distribution is 68.84% & 31.16% in terms of population where majority of the rural people do not speak English. Therefore, the need to develop content in all the official languages of India becomes all the more important. While there are many challenges in development of local language content particularly due to the absence of script and font standardization, local language computing becomes problemetic though not impossible. However, this needs to be addressed immediately. The main problem which the current scenario is facing is high cost of acquiring and installing, operating and maintaining 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).

The common mistakes in the introduction of ICTs in teaching are appended below:

(i)   Installation of learning technology without any review of the need of students and availability of contents.

(ii) Imposition of new technology without any involvement of faculty and students.

(iii) Use of inappropriate contents from other regions of the world without its proper customization.

(iv) Production of low quality content having poor instructional design.

As per the report of UNESCO (2009), ICT in our education has posed some risk factors also which are as follows:

(1) 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.

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

(3) 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.

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

Conclusion

Around the globe it has been accepted by all that education is the biggest driving force behind the social and economic development of any nation and its access and affordability for everybody has now made possible by ICT. But still a lot has to be done to achieve the desired level of IT adoption in higher education. The use of ICT is a symbol of a new era in education. Besides this, ICT alters thought patterns, provides new training models with the enrichment of existing educational models. In our globalizing society, the ever increasing demand for skilled and competent labour has seen a drastic boom. In this scenario, the access to higher education with quality is a very determining factor for the economic and social development of the individual. The last two decades of our education sector have witnessed the development of ICTs and its use in education not only improves classroom teaching learning process, but also provides the facility of e-learning. The use of ICT has enhanced distance learning and with this the teaching community is able to reach the remotest areas and learners are also getting benefitted from any corner of the world. It can be said that ICT enabled education has enabled the democratization of education.

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