

## **ROLE OF INFORMATION TECHNOLOGY IN EDUCATION IN INDIA**

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**ABSTRACT:** The focus of this paper is to examine the role of Information and Communication Technology (ICT) in higher education in India. The emergence of ICT has fundamentally changed the practices of not only business and governance but education as well. While the world is moving rapidly towards digital media, the role of ICT in education has become increasingly important. There has been an unprecedented growth in the use of ICTs in teaching, research and extension activities. The sudden boom in Information Technology has transformed the way how knowledge is disseminated today. One of the changes it has brought about is the way how teachers interact and communicate with the students and vice-versa. Given the fact that higher education in India is plagued by the challenges of inadequate technology access and inequity coupled with economic considerations and technological know-how, it remains to be seen how Information and Communication Technology can actually burgeon the students and how it can foster change in this aspect. Moreover, this paper explores the emancipatory and transformative potentials of ICT in higher education in India. Finally, this paper assesses how Information Technology has facilitated the growth in interactive learning and what has been its impact in the higher educational scenario in the country.

**Keywords:** education, information, technology, teaching, collection,

### **INTRODUCTION**

The emergence of Information and Communication Technology (ICT) has fundamentally changed the practices of not only business, governance or education but every spheres of human endeavour. As the world population edged to 7 billion in 2011, it has profound implications in every sphere (UN, 2013). India has a massive 1.2 billion population (Census, 2011) of which a high proportion of them are young. The demand for education in developing countries like India has skyrocketed as education is still regarded as an important bridge of social, economic and political mobility. India has innumerable challenges in terms of infrastructure, socio-economic, linguistic and physical barriers for people who wish to access education<sup>1</sup>. However, it is hoped that ICT can transform the educational scenario in the country. But then, can it address these needs and perform multiple roles in higher education to benefit all stakeholders? The emancipatory and transformative potentials of ICT in higher education in India has helped increase the country's requirement of higher education through part-time and distance-learning schemes. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers (McGorry, 2002).<sup>2</sup> Mooij (2007) states that differentiated ICT based education can be expected to provide greater reliability, validity, and efficiency of data collection and greater ease of analysis, evaluation, and interpretation at any educational level. While the world is moving rapidly towards digital media, the role of ICT in education has become increasingly important. It has transformed the way how knowledge is disseminated today in terms of how teachers interact and communicate with the students and vice-versa.<sup>3</sup>

#### **Need of the IT**

1. Education is a life long process therefore anytime anywhere access to it is the need
2. Information explosion is an ever increasing phenomena therefore there is need to get access to this information
3. Education should meet the needs of variety of learners and therefore IT is important in meeting this need
4. It is a requirement of the society that the individuals should possess technological literacy
5. We need to increase access and bring down the cost of education to meet the challenges of illiteracy and poverty-IT is the answer

The information society challenges the education system. In recent years, the speedy, effective and global communication of knowledge has created a new foundation for co-operation and teamwork, both nationally and internationally. The increasing role played by information technology in the development of society calls for an active reaction to the challenges of the information society. Already, new and greater demands are being made as to the core qualifications of individuals, as well as to their understanding and knowledge of the consequences of the introduction of information technology for the work and organisation of a company. Companies are no longer forced to gather all their functions in one place. The knowledge-intensive functions such as development and marketing can be sited in countries where the labour market can supply highly educated employees, whilst production itself can be moved to low wage countries. The result is the efficient handling, processing, co-ordination

and administration of company resources, which is decisive for the competitiveness of the company. In a society which is becoming increasingly dependent on information and the processing of knowledge, great demands are therefore made that the individual should have a solid and broad educational foundation on which to build. Educational policy in the information society must ensure that.<sup>4</sup>

Table 1. Changes in Students and Teachers Roles in Learner-Centered Environments.

<b>Changes in Teacher Role</b>	
<p><b>A Shift from</b>                      Knowledge transmitter, primary source of information, content expert and source of all answers                      Teacher controls and directs all aspects of learning                      Changes in Student Role</p>	<p><b>A Shift to</b>                      Learning facilitator, collaborator, coach, mentor, knowledge navigator and colearner                      Teacher gives students more options and responsibilities for their own learning</p>
<p><b>A Shift from</b>                      Passive recipient of information                      Reproducing knowledge                      Learning as a solitary activity</p>	<p><b>A Shift to</b>                      Active participant in the learning process                      Producing and sharing knowledge, participating at times as expert                      Learning collaboratively with others</p>

Sources:(Table adapted from one developed by Newby et al.,2002)

### Higher Education Scenario in India

India has one of the largest higher education systems in the world consisting of over 651 universities according to UGC as on 2013. Besides there are 31,324 colleges of higher learning in the country as on August 2011 according to the Higher Education in the 12th Five-Year Plan Report (2012-17). The number of students enrolled in the universities and colleges has increased since independence to 13,642 million in the beginning of the academic year 2009-10 with 1,669 million (12.24%) in the university departments and 11.973 million (87.76%) in the affiliated colleges (MHRD, Annual Report, 2009-10). However, this growth in numbers does not reflect much improvement in the delivery of higher education in the country.<sup>5</sup>

Table 2. Type-wise classification of Universities in India.

Sl. No	Type of Institution	No. of Institution (as on 2006)	No. of Institution (As on 2013)
01	Central Universities	20	44
02	State Universities	217	310
03	Private Universities	8	168
04	Institutions Deemed to be Universities	104	129
Total		349	651

(Source: UGC excluding institutions of national importance)

The higher education system in India continues to suffer due to inadequate access to technology and inequity. However, the application of ICT in higher education has not only brought about diversification in higher education but has also fostered new avenues for international mobility of traditional and non-traditional students. While it is believed that ICT can transform the educational scenario in the country, it should address the needs and perform multiple roles in higher education to benefit all stakeholders. This sense of urgency and the continuous implementation of ICT in higher education have led many universities and colleges into a more action-oriented adaptation approach. It is observed that the focus is often more on the end product than on the premises and processes behind a well-functioning incorporation of ICT in teaching and learning.<sup>6</sup>

### ICT application for quality improvement in formal and Non-formal education:

ICT applications are becoming indispensable parts of contemporary culture, spreading across the globe through traditional and vocational education. In Indian scenario, mainly education system has three tiers primary (including nursery and preprimary), High school or secondary level (High and senior secondary levels) and the college or higher level (including college, university levels). In all these levels of education ICT can be utilized for better teaching learning process and improving quality of education. Using multimedia in education results in the increasing productivity and retention rates, because people remember 20% of what they see, 40% of what they see and hear, but about 75% of what they see and hear and do simultaneously. Interactive whiteboard helps teachers

to structure their lessons, supports collaborative learning, can help to develop student 's cognitive skills, enables ICT use to be more integrated into classroom. Government of India has announced 2010-2020 as decade of innovation. Reasoning and critical thinking skills are necessary for innovation. Foundation of these skills can be laid only at primary level of education. Students who enter school are very curious, creative, and capable of learning many things. At this level, statement Picture is worth than thousand of words is very much true in case of teaching –learning process. Befriending ICT in the initial stages of education will help young people come to terms with what lies ahead. Students at this level take much interest in cartoons. They understand more through animated pictures. Hence if the same environment is created in schools by using ICT for teaching kids at primary level may bring drastic changes in the education scenario. Nursery students can be taught by showing pictures, animals, fruits etc. With the help of ICT tools students at this level are able to grasp a lot by hearing voices or sounds and animated motion of various animals. Language learning is also taught at this level. To know a new language at this age is easier as compared to other levels. Multimedia projector & computer can be used to teach phonetics and pronunciation. Lessons, poems & lectures by eminent scholars stored in computers or other ICT tools can easily be shown to the students time and again anywhere. Such type of teaching and learning retains for long time in the minds of the children. At high school level subjects like History, Geography, Political science, Physics, Chemistry, Biology, Physical education etc are taught. Lessons in these subjects can easily be taught by showing small movie related with the subject to create interest among the students. Such type of movies and related multimedia material is easily available at academic repositories and from various related sites with the help of Internet. Internet is basic tool which can be utilized by teachers and students to find any information on any topic. This type teaching – learning makes the environment very interactive and is liked by students. Educational and practical CD's available in the market make this task easier to implement.<sup>7</sup> At college level various facilities like computers, Electronic Board, Edusat facility initiated by various state Governments, MM projector and other peripheral devices related with teaching learning process are easily available. Various programs running on Edusat are also very helpful for the students. Soft skill program can help students in getting their placements in reputed Multi National Companies (MNCs). State level quiz and seminar can also be conducted with the help of Edusat infrastructure and can be transmitted throughout all institutes. Edusat can be used for providing training to teachers on the latest subjects and technologies and can save lot of time and money of governments. In Haryana Edusat project is being implemented at school and college level and is being used for transmitting lectures according to syllabi. In Non-formal learning, learners can access information and learning materials from anywhere and at any time. It includes distance education and other open learning systems. There are various functions to be performed with the enrolment of students in any course of distance education in any University or institute. Functions include allotment of unique number (called reference number/roll number), providing books, providing information related with installment of fees and details thereof to name a few. Out of all these activities some of these may be performed well with the help of ICT Tools. In the distance education ICT can be used for better management of records by making a complete database of all the students in various courses. Once the students are enrolled, a unique number is generated called reference number and it is provided to the particular students. Short Message Service (SMS) of Mobile phone may be utilized for this purpose. Mobile phone is one major ICT tool and can be used for the purpose. Other information related the PCP, Exam dates can easily be sent to the students through SMS by Universities/ Institutes concerned. Moreover the enrolled students can be given username and password for using various online services and resources in the form of academic repositories maintained by institutes.<sup>8</sup> All such instructional material may be uploaded at the University portal and CDs of those lectures may be provided to the students instead of printed or hard copy material. Online fees payment system can also be made on the portal of concerned University or Institute. Students will be saved from a lot of hardships they face in depositing fees, attending PCPs, taking exams and many more. Exam results in such cases may be provided online on the same day as same is happening in case of online exams and entrance tests. This would help to sort out the problem of the delay in declaration of results of various exams by various universities. But all this must be the case for the Non-formal education system. Advantages of utilizing such tools include saving of lot of paper work and help the environment making it pollution free. This will also bring transparency in the whole system of functioning. Role of IT in education

### **Access to variety of learning resources**

In the era of technology. IT aids plenty of resources to enhance the teaching skills and learning ability. With the help of IT now it is easy to provide audio visual education. The learning resources are being widens and widen. Now with this vivid and vast technique as part of the IT curriculum, learners are encouraged to regard computers as tools to be used in all aspects of their studies. In particular, they need to make use of the new multimedia technologies to communicate ideas, describe projects, and order information in their work.

### **Immediacy to information**

IT has provided immediacy to education. Now in the year of computers and web networks the pace of imparting knowledge is very very fast and one can be educated anywhere at any time. New IT has often been introduced into well-established patterns of working and living without radically altering them. For example, the traditional office, with secretaries working at keyboards and notes being written on paper and manually exchanged, has remained remarkably stable, even if personal computers have replaced typewriters.<sup>9</sup>

### **Any time learning**

Now in the year of computers and web networks the pace of imparting knowledge is very very fast and one can be educated. One can study whenever he wills irrespective of whether it is day or night and irrespective of being in India or in US because of the boom in IT.

### **Collaborative learning**

Now IT has made it easy to study as well as teach in groups or in clusters. With online we can be unite together to do the desired task. Efficient postal systems, the telephone (fixed and mobile), and various recording and playback systems based on computer technology all have a part to play in educational broadcasting in the new millennium. The Internet and its Web sites are now familiar to many children in developed countries and among educational elites elsewhere, but it remains of little significance to very many more, who lack the most basic means for subsistence.<sup>10</sup>

### **Multimedia approach to education**

Audio-Visual Education, planning, preparation, and use of devices and materials that involve sight, sound, or both, for educational purposes. Among the devices used are still and motion pictures, filmstrips, television, transparencies, audiotapes, records, teaching machines, computers, and videodiscs. The growth of audio-visual education has reflected developments in both technology and learning theory.

Studies in the psychology of learning suggest that the use of audio-visuals in education has several advantages. All learning is based on perception, the process by which the senses gain information from the environment. The higher processes of memory and concept formation cannot occur without prior perception. People can attend to only a limited amount of information at a time; their selection and perception of information is influenced by past experiences. Researchers have found that, other conditions being equal, more information is taken in if it is received simultaneously in two modalities (vision and hearing, for example) rather than in a single modality. Furthermore, learning is enhanced when material is organized and that organization is evident to the student.<sup>11</sup>

### **Authentic and up to date information**

The information and data which are available on the net is purely correct and up to date. Internet, a collection of computer networks that operate to common standards and enable the computers and the programs they run to communicate directly provides true and correct information.

### **Online library**

Internets support thousands of different kinds of operational and experimental services one of which is online library. We can get plenty of data on this online library.

As part of the IT curriculum, learners are encouraged to regard computers as tools to be used in all aspects of their studies. In particular, they need to make use of the new multimedia technologies to communicate ideas, describe projects, and order information in their work. This requires them to select the medium best suited to conveying their message, to structure information in a hierarchical manner, and to link together information to produce a multidimensional document.<sup>12</sup>

## **CONCLUSION**

Quality in education through ICT and its awareness among stakeholders will have positive impact on the society. ICT can be helpful in quality and standards of education by implementing it in various phases of education. ICT can be employed in formal and Non-formal types of education and would eventually make the learners employable and socially useful part of the society. By employing ICT in teacher training can save a lot of money of the Government. Moreover a lot of qualitative improvement can be seen as resource persons for the training can be

best of the world. By employing ICT in administration can help in solving the problem of Absenteeism of students and teachers. Good quality content is one of the major issue and directly affects the standards of education and quality. By overcoming the certain challenges involved in the process of education can help a lot in this side. Conclusively a lot of quality improvement is possible after careful and planned implementation of ICT in education by various stakeholders.

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