

# IMPACT OF ICT IN HIGHER EDUCATION

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## ABSTRACT

*In this modern era, education is viewed as a powerful means to build knowledge based society. The higher education system in india suffers from several deficiencies though it has attempted in many ways to grow after independence. Higher education is considered to play a key role in the development of a country as it has the power to build knowledge based society and in this direction, Information and Communication Technology (ICT) can play a critical role to accelerate the pace of creating new knowledge. The introduction of ICT in the higher education has had a profound implication for the whole education process, especially in dealing with key issues of access, equity, management, efficiency, pedagogy and quality. This papers gives an account of the opportunities and challenges posed by integration of ICTs in various aspects of higher education, which is the objective of this paper.*

**Keywords:** *ICT, higher education, e-learning.*

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## 1.INTRODUCTION

In this modern era of knowledge-driven economy and learning societies, both formal and informal education is playing an increasingly vital role in promoting economic solidarity, social cohesion, individual growth and sustainable development. As far as India is concerned, to benefit from the demographic dividend in the years to come it has to make best use of all of its potentials and for this education is the biggest tool. After China and USA, the Indian Higher Education System has established itself as the largest system in the world in terms of number of institutions and student enrollment[1]. This paper discusses on the opportunities available and concerns regarding the present status of higher education system in India and also the contributions that could be provided by recent developments in Information and Communication Technology (ICT) for addressing some of these concerns.

## 2.HIGHER EDUCATION IN INDIA

The main governing body of the Indian higher education system at the tertiary level is the University Grants Commission, which enforces its standards, advises the government, and helps to coordinate between the centre and the state. Universities and its constituent colleges are the main institutes of higher education in India. Table No. 1 gives the brief overview of the present status of higher education in India.

Particulars	2012 - 13	2013 - 14	2014 - 15
No. of Universities	667	723	760
Number of Colleges	35,525	36,634	38,498
Number of Stand Alone Institutions	11,565	11,664	12,276
Enrolment in Higher Education	301,52,417	323,36,234	342,11,637
Gross Enrolment Ratio (GER)	21.5%	23%	24.3%
Enrolment in University & Constituent Units	58,43,660	63,79,598	63,87,255
No. of Foreign Students	34,774	39,517	42,293

Source: All India Survey on Higher Education, 2015, MHRD.

### 3.RELEVANCE OF HIGHER EDUCATION IN INDIA

Education is the driving force of economic and social development in any country[2]. Higher education is considered to drive the competitiveness and employment generation in India. Education increases the productive skills of the individual and also his earning power. It gives him a sense of well being as well as capacity to absorb new ideas, increases his social interaction, gives access to improved health and provides several more intangible benefits[3]. 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[4].

In India, higher education imparted by universities is facing challenges in terms of Access, Equity and Quality. In terms of Gross Enrollment Ratio (GER), India still lags behind the worldwide average and emerging countries like Brazil and China. Considering this, it is necessary to find ways to make education of good quality, accessible and affordable to all. The Government of India has taken several initiatives in the past to increase access to higher education by adopting state specific strategies, enhancing the relevance of higher education through curriculum reforms, vocational programs, networking, information technology adoption and distance education along with reforms in governance. However, research findings have shown that the overall state of higher education is dismal. It is considered that there is a severe constraint on the availability of skilled labor[5]. There also exist socio-economic, cultural, time and geographical barriers for people who wish to pursue higher education[6].

Some of the key challenges facing higher education in India in terms of Access, Equity and Quality are insufficient infrastructure to meet the growing demand for higher education, wide disparity in higher education GER across states, urban vs. rural areas, gender and communities that have to be bridged and faculty shortage. At present, approximately 18% of India's population falls in the 15 to 24 age group (ie., about 230 million people). If India is to meet its 30 percent GER target by 2020, about 40 million students would be enrolled in the higher education system

in 2020[7]. This means we will have to more than double our enrollment in next few years. Some of the key issues which act as barrier to achieving a higher GER include:

- **Access to education-** There exist infrastructure, socio- economic, linguistic and physical barriers in India for people who wish to access education[6].
- **Quality of education-** This includes infrastructure, teacher and the processes quality.
- **Resources allocated-** Central and State Governments reserve about 3.5% of GDP for education as compared to the 6% that has been aimed.
- **Delivery -** Inability of delivery of traditional teaching / learning methods considering the scale to be achieved in a country like India

Innovative use of Information and Communication Technology can potentially solve or reduce some of these problems.

#### 4.INTEGRATION OF ICT IN EDUCATION

The last two decades have witnessed a revolution caused by the rapid development of Information and Communication Technology (ICT). ICT has changed the dynamics of various industries as well as influenced the way people interact and work in the society[6]. Internet usage in home and work place has grown exponentially[8]. ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. 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 barriers like time and distance[8]. If India were to create the required additional capacity to reach education to masses through increase in brick and mortar institutions alone, it would have had to build six universities and 270 colleges each and every month in the last 20 years – a feat that would have been impossible to achieve with India’s limited resources[9]. Instead, india chose to integrate ICT in education to reach masses. ICT can be used as a tool in the process of education in the following ways:

- *Informative tool:* It provides vast amount of data in various formats such as audio, video, documents.
- *Situating tool:* It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
- *Constructive tool:* To manipulate the data and generate analysis.
- *Communicative tool:* It can be used to remove communication barriers such as that of space and time [10].

The rationale for using ICT in education are given in Table2[11].

<b>Table 2: The Four Rationales for Introducing ICT in Education</b>	
<b>Rationale</b>	<b>Basis</b>
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)	

While using ICT in higher education, the following mediums are used for the delivery and for conducting the education process:

- *Voice* – Instructional audio tools that include interactive technologies as well as the passive ones.
- *Video* - Instructional video tools that include still images, prerecorded moving images, and real-time moving images combined with audio conferencing.
- *Print* – instructional print formats that include textbooks, study guides, workbooks and case studies[6].

The various kinds of ICT products are available having relevance to education. ICT tools such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, and CD ROMs etc have been used in education for different purposes [12][13].

ICTs 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[6][14]. Such facilities allow the networking of academics and researchers and hence sharing of scholarly material. This avoids duplication of work[14]. Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems[6][15]. It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy[3].

The main stakeholders in education are the students, employers and the government, introduction of ICT will provide benefits for these stakeholders and some of these are given below.

<b>Benefits of ICT in education to the main stakeholders.</b>	
Student	<ul style="list-style-type: none"> <li>• Increased access,</li> <li>• Flexibility of content and delivery,</li> <li>• Combination of work and education,</li> <li>• Learner-centered approach,</li> <li>• Higher quality of education and new ways of interaction.</li> </ul>

**Employers**

- High quality, cost effective professional development in the workplace,
- Upgrading of employee skills, increased productivity,
- Development 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.

**5.APPLICATION OF ICT IN HIGHER EDUCATION**

Realising the value that could be provided by ICT in education there have been many attempts incorporate ICT in higher education. Some of these trends seen in use of ICT by higher education institution are:

*Digitization of Books (E-Text Books):* There is an increased trend towards creation of a digital repository of books to create a digital learning environment for students. The digital version of the books embedded with text, pictures along with video, simulations and visualizations help students learn the concepts in an interactive way. Efforts are going on to prepare course content for 130 courses (UG and PG).

*Content Delivery using IT/ICT:* Higher Education is mainly a content driven play, where educational content can be effectively delivered through innovative use of ICT. There is an increased trend in higher education institutes to render content through radio, TV, internet and satellite.

*Open Education Resources:* Many Indian universities are contemplating technology enabled free access of education resources. AICTE – Indian National Digital Library in Engineering & Technology (AICTE – INDEST) is a consortium set up by the Ministry of Human Resource to enhance greater access and generate annual savings in access of bibliographic databases. UGC has also launched its Digital Library Consortium to provide access to peer reviewed journals and bibliographic databases covering subjects such as arts, humanities, technology and sciences.

*Virtual University:* The National mission on Education through ICT is working on a war foot to establish a virtual technical university to impart training to UG/PG students.

*Mobility:* With the proliferation of mobile phones on campus, colleges everywhere are compelled to capitalize on feature-rich phones that are capable of much more than just voice calls. Adoption of smart devices that have Internet access allows students and faculty members to perform a wide range of assignments. Tasks like administration, sharing class notes, downloading lectures, instant messaging, etc., are possible anywhere cell phone service is available. Mobile phones are also being used to access computer files from remote locations.

*Social Learning:* The emergence of Web 2.0 and social networking such as blogs and wikis, as well as new online video repository and delivery websites such as YouTube are influencing a new trend in higher education. These technologies create new channels for content delivery, online video expansion and podcasting. While traditional Learning Management Systems (LMS) like Blackboard are course-centered and driven by faculty, the new trend in education is to create a “learner-centric” system.

E Learning is one of the most important applications of ICT in education. This has been an area which is being increasing used by higher educational institutions all over the world. Some of the advantages provided by e-learning is given below.

**Advantages of E learning:**

- Eliminating time barriers in education for learners as well as teachers
- Eliminating geographical barriers as learners can log on from any place
- Asynchronous interaction is made possible leading to thoughtful and creative interaction
- 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
- It allows for just in time and just enough education for employees in organizations
- It can also be used for non-formal education like health campaigns and literacy campaigns

Acknowledging the benefits that application of ICT in higher education could provide for the development of the country, India has been making gradual progress in integrating ICT in education. India is making use of powerful combination of ICTs such as open source software, satellite technology, local language interfaces, easy to use human-computer interfaces, digital libraries, etc. with a long-term plan to reach the remotest of the villages. Community service centers have been started to promote e-learning throughout the country[6].

Although ICT offers a whole lot of benefits there are some risks of using ICT in education which have to be considered while adopting it.

### Potential drawbacks of using ICT in education

- Digital divide may be caused within a class as students who are more familiar with ICT will reap more benefits and learn faster than those who are not that technology savvy .
- It is possible that attention may be shifted from the primary goal of the learning process to developing ICT skills, which is the secondary goal.
- It may 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.
- Not all teachers are experts with ICT and hence they may not be updating the course content online which can adversely affect the learning among students.
- The potential of plagiarism is high as student can copy information rather than learning and developing their own skills.
- There is a need for training all stakeholders in ICT and it may incur cost and require effort.
- The cost of hardware and software can be very high.

## 6.CONCLUSION

Higher education is considered to play a significant role in the development of a country, as it is viewed as a strong mechanism to build knowledge based society and hence Information and Communication Technology (ICT) can play a critical role to accelerate the pace of creating new knowledge, if integrated in higher education. The introduction of ICT in the higher education has had a profound implication for the whole education process, especially in dealing with key issues of access, equity, management, efficiency, pedagogy and quality. In general, ICT offers a lot of benefits to higher education and its stake holders. There are some potential drawbacks also to be taken care of, when ICT is integrated with education system. This paper discussed the impact of ICT in higher education in India.

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