

# Impact of ICT in Higher Education: Opportunities and Challenges

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## ABSTRACT

Higher education in India has gained momentum due to advancements in Information and Communication Technology (ICT). The ICT is the driving force for the successful delivery of quality education in higher learning. The last two decades have witnessed the inclusion of developments in ICTs in higher education systems around the world. Demand for skilled and competent manpower is increasing day by day in this modern globalised society. The Government of India is sponsoring students from primary level till to the higher education level but much needs to be done to make an educated nation that is technologically literate. Access to quality higher education 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 and online learning courses is on the increase. Presently higher education in India is experiencing a major transformation in terms of access to the ICT. In addition, it is catering to life-long learning aspirations and that too at affordable cost. Still in spite of many advantages and opportunities there are some uncertainties and challenges of using ICT in higher learning.

In this backdrop, this paper addresses the opportunities and challenges posed by integration of ICTs in various aspects of higher education in the present scenario. Further this paper critically analyzes some of the challenges related ICT in the Indian Education System.

**Keywords:** Communication; Digital India; Higher Education; ICT; IT; Learning; Quality.

## 1.INTRODUCTION

Information and Communication Technology (ICT) is referred to as the collection of technological tools and resources used to communicate, generate, distribute, collect and administer information. ICT is a force that has changed many aspects of our day to day life.

Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, **Information and Communication Infrastructure (ICI)** which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and **Information**

*Technology (IT)* that refers to the hardware and software of information collection, storage, processing, and presentation.

Introducing ICT as a tool to support the education sector has initiated substantial discussions since the late 1990s. A decade ago the emphasis was on Technical and Vocational Education and Training and training teachers. During the last few years an increasing number of international development agencies have embraced the potential of ICT to support the education sector.

When looking at the integration of ICT to support the achievement of educational objectives, it can be found that after almost a decade of using ICT to stimulate development, it is not yet fully integrated in development activities and awareness rising is still required.[1]

## **II.ROLE OF ICT IN HIGHER LEARNING INSTITUTIONS**

Nowadays the role of Information and Communication Technology (ICT), especially internet in the education sector plays an important role, especially in the process of empowering the technology into the educational activities. Education sector can be the most effective sector to anticipate and eliminate the negative impact of ICT.

ICT role in higher education is solicited for improving quality, widening access and enhancing operational efficiency across all functions in higher education sector and to create new dynamics in higher education both at micro and macro levels. [2]

The Information and Communication Technology (ICT) curriculum provides a broad perspective on the nature of technology, how to use and apply a variety of technologies, and the impact of ICT on self and society. Technology is about the ways things are done; the processes, tools and techniques that alter human activity. ICT is about the new ways in which people can communicate, inquire, make decisions and solve problems.

Enhancing and upgrading the quality of education and instruction is a vital concern, predominantly at the time of the spreading out and development of education. ICT can improve the quality of education in a number of ways: By increasing student enthusiasm and commitment, by making possible the acquirement of fundamental skills and by improving teacher training. ICTs are also tools which enable and bring about transformation which, when used properly, can encourage the shift an environment which is learner-centered.

ICTs which can be in the form of videos, television and also computer multi-media software, that merges sound, transcripts and multicolored moving imagery, can be made use of so as to make available stimulating, thought provoking and reliable content that will keep the student interested in the learning process.

The use of online pedagogy within universities and management institutes is increasing. The introduction of the Wi-Fi system too has led to the growth of hi-tech education system, where accessibility and accountability of subject matter is made readily available to the students. The students can now study and comprehend the related information at their own convenient time. [1]

## **III.IMPACT OF ICT ON HIGHER EDUCATION**

Tools are now available on the Internet to assist both teachers and students to manage writing assignments to detect and avoid the pitfalls of plagiarism and copyright violations. One of the great benefits of ICTs in teaching

is that they can improve quality and quantity of educational provision. For this to happen however, they must be used appropriately. [1]

- 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.
- ICT change the concept of learning within the four walls as the introduction of technology learning breaks the boundaries of universities and colleges and offers the learners can learn irrespective of place and time. The individuals can access the data whenever they want and from wherever they may be learning occurs.
- The change in professional practice in which teachers are now enabled to design to incorporate the more complex real world projects by using ICT tools and resources and develops new educational approaches
- It provides a new concept of learning environment in the institutions and enhances the quality of education to produce the quality products
- During the last decade, higher education has gained importance in India's changing policy landscape as the government realizes that India's strength lies in education. The gap between demand and supply of higher education has necessitated the governments and institutions to formulate the policies for the better use of ICT. And, in order to bridge the gap, it is necessary to evolve the cooperation between the public and private sectors for the successful implementation of ICT in higher education.
- The evolution of ICT into universities clearly changes the way education is conducted. Not only is it possible to work with distance learning and achieve a closer collaboration between different universities, but also paving the way for a new pedagogical approach where there is unparalleled ability to spread knowledge and disseminate information. The pace of change brought about by new technologies has had a significant effect on the way people live, work and play worldwide [2]

#### **IV.COMMITMENT OF GOVERNMENT TOWARDS ICT**

For the successful delivery of ICT the commitment of the Government is of paramount importance, so this calls for a budget set aside each year for the ICT infrastructure. The Internet as a carrier of services has to be accessible and robust, and the information transmitted online has to be processed in a secure manner.

The Government of India is working flat out to improve the infrastructure of ICT and IT related services through the initiatives like "digital India". Digital India is an initiative of Government of India to integrate the government departments and the people of India. It aims at ensuring that the government services are made available to citizens electronically by reducing paperwork. The initiative also includes plan to connect rural areas with high-speed internet networks. Digital India has three core components. These include:

- The creation of digital infrastructure
- Delivering services digitally
- Digital literacy

The project is slated for completion by 2019. A two-way platform will be created where both the service providers and the consumers stand to benefit. The scheme will be monitored and controlled by the Digital India Advisory group which will be chaired by the Ministry of Communications and IT. It will be an inter-ministerial

initiative where all ministries and departments shall offer their own services to the public Healthcare, Education, Judicial services etc. The Public-Private Partnership model shall be adopted selectively. In addition, there are plans to restructure the National Informatics Centre. This project is one among the top priority projects of government of India (GOI).

The GOI has implemented several national as well as state specific schemes that run concurrent to large number of privately led ICT initiatives at school and higher education levels. Draft of National Policy on ICT in School Education is available in the MHRD's website. 11th Five Year Plan has proposed for launching of a National Mission in Education through ICT to increase ICT coverage in all the 378 universities and 18064 colleges. The Mission aims to focus on digitization and networking of all educational institutions, developing low cost and low power consuming access devices, and making available bandwidth for educational purposes.

Collaborative efforts of agencies such as MHRD Department of Information Technology (DIT), Department of Tele communications (DoT) would be utilized to ensure fully electronic universities and digital campuses. Although, advanced computational facilities will be provided in select institutions. Despite the fact that ICTs in education has gained recognition and place in national and state specific policy and plan documents yet it would be advantageous to have a focused national level ICT policy framework to provide the necessary thrust, direction and guidelines to strategies at all levels of education.[3]

The Indian higher education system has undergone massive expansion to become the largest in the world enrolling over 70 million students. Such expansion would have been unimaginable without the extensive use of ICT tools.[4]

***Some of the notable initiatives of use of ICT in education in India include:***

- ✓ Indira Gandhi National Open University (IGNOU) uses radio, television, and Internet technologies for teaching-learning process.
- ✓ National Programme on Technology Enhanced Learning: a concept similar to the open courseware initiative of MIT. It uses Internet and television technologies. "The idea is simple: to publish all of their course materials online and make them widely available to everyone."
- ✓ Eklavya initiative: Uses Internet and television to promote distance learning. Eklavya Technology Channel is a distant learning joint initiative by the IIT and IGNOU. It was inaugurated by Prof. Murli Manohar Joshi, Honorable Minister, HRD, on 26 January 2003.
- ✓ IIT-Kanpur has developed Brihaspati, an open source e-learning platform.
- ✓ Premier institutions like IIM-Calcutta have entered into a strategic alliance with NIIT for providing programmes through virtual classrooms.
- ✓ The Spoken Tutorial project is the recent initiative of the 'Talk to a Teacher' activity of the National Mission on Education through Information and Communication Technology (ICT), launched by the Ministry of Human Resources and Development, Government of India in the year 2015. The target group is the community at large, including school children, college students, working professionals, retired professionals, teachers, trainers, research scholars, software users and developers. More than 12 lakh

students have been trained so far under the Spoken Tutorial Project. Spoken Tutorial also allows students to take online examinations and get certificates.

## **V. CHALLENGES OF ICT IN HIGHER EDUCATION**

While using ICTs in teaching 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 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 [1]

1. Resistance to change from traditional pedagogical methods to more innovative, technology based teaching and learning methods, by both students and academics. The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the Internet and procurement of computers is rather slow in some instances, and in others there are no aids or support by the government at all.
2. Inadequate ICT infrastructure including Computer hardware and software and bandwidth/access but the introduction of 4G technology has improved issue of internet bandwidth to some extent.
3. Lack of qualified ICT personnel. Most institutions lack computer literate teachers and ICT experts that would support and manage the Internet connectivity and/or application of computing in the teaching-learning process. The cost of equipment in a country like India with a battered economy and seriously devalued currency is enormous. However, it should be noted that the problem might not be the funds nor the technology but rather the will on the part of government.
4. India lacks the necessary infrastructural facilities to benefit from ICT. Again, most of the ICT infrastructures such as internet, tele-fax, e-mail are dependent on different service providers across India. These services are epileptic in delivery and attract unbearably high bills.
5. Implementation of ICT in educational institutions is one of the big challenge due to high cost incurred for acquiring and instillation of latest software and in addition to that various opportunity cost to institutions for infrastructure development.
6. Establishment of ICT infrastructure is not sufficient to achieve the goals of successful integration of ICT in educational institutions. However the development of e-content , its dissemination, selection and evaluation requires large scale networking among the users and producers and intellectual property rights among the stake holders is the major concern for the holistic integration ICT in education.
7. There are number of institutions across India which offer online degree courses but are these degree courses acceptable for the purpose of employment in India? Are these courses treated at par with other conventional courses? Are these institutions recognized to offer these online courses? These questions need to be answered.
8. Besides the lack infrastructure to accommodate the technology, problems in electricity, network availability, lack of awareness towards technology and utilization technology with improper knowledge were adding complexities for the successful implementation of ICT in educational institutions.

9. India has one of the lowest percentage of schools with information and communications technology, according to a study by UNESCO Institute of Statistics.

## **VI.RECOMMENDATION**

The following key points may be considered as recommendations for the development of ICT driven education in India:

1. Adequate funding is necessary for tertiary education in general and development of ICT in particular. To this end, government should increase funding for the entire educational sector.
2. In addition to improved funding by the government and revenue generation drives by individual institutions, government needs to implement policies which will draw the private sector into ICT development. Government should work with the private sector and civil society to ensure affordable and sustainable access to ICT infrastructure.
3. There should be frequent workshops and training programs to train the teaching and non-teaching staff of higher learning institutions in order to make them competent to handle and operate the ICT infrastructure and services.
4. There should be clear cut instructions from the concerned authority regarding the validity and recognition of online degree courses being offered by institutions across India.

## **VI.CONCLUSION**

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 labor 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.

This paper addresses the opportunities and challenges posed by integration of ICTs in various aspects of higher education in the present scenario. Further this paper critically analyzes some of the challenges related ICT in the Indian Education System. This paper has also discussed the initiatives taken by the government to implement ICT in higher learning. We further came up with recommendations to address the different issues.

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