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Implementation of ICT in Higher Education in India: Its Challenges and Opportunities

Prapti Borthakur

Research Scholar

Cotton University, Assam

Abstract: Information and Communication Technology stands as a major component in transforming the outlook of the global economy, by metamorphosing the economy based on primitive tools and technologies to an economy based on modern and advanced technologies. With the changing work culture of all the sectors after introduction of ICT, its role in teaching, research and extension activities has become increasingly important. The teaching – learning system is gradually heading towards a more student – centric approach, which is far more ahead of the age – old conventional teacher –centric approach. A proper and suitable implementation of ICT in education has been widely accepted as an initiative, which is not only expected to expand scholastic opportunities in the near future but also to enhance the quality of teaching and learning and to improve proficiency in management, especially in higher education. The higher education system in India is plagued by the challenges of inadequate technology access and inequity coupled with economic considerations and technological know-how, it is important to study the issues and challenges faced by the entire education system. This paper intends to explore the transformative potentials of ICT in higher education in India and also to assess the role of ICT in facilitating the growth of a nation as a whole.

Keywords: *ICT, education, higher education, economic development*

Introduction:

ICT refers to an umbrella term which incorporates all electronic tools and technologies as a mean to collect, process, and also exchange and transmit information to others at a faster pace. The introduction of ICT, especially the internet, in the educational framework can be contemplated as a potential initiative to move towards the 21st – century reforms in this sector. Proper, suitable, and efficient enactment and administration of ICT in education can be expected as a process to elevate the power of the students to acquire knowledge and skills as life – long learning and also to enable both teachers and students to adopt a new way of teaching and learning. The emergence of ICT has fundamentally changed the practices of not only business, governance or education but every spheres of human endeavor. 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 reached its pick as education is still regarded as an important bridge of social, economic and political mobility (Amutabi & Oketch, 2003). India is always constrained with various challenges in terms of infrastructure, socio-economic, linguistic and physical barriers for people who wish to access education (Bhattacharya & Sharma, 2007). However, it is hoped that ICT can transform the educational scenario in the country.

The transformative potentials of ICT in higher education in India have helped to 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). Mooij (2007) stated 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. Besides, it can provide networking structures transcending borders and foster empowerment amongst students.

Table 1: Key Transformations in Teaching-Learning Process

Transformations of a Teacher's Role	
A Switch from	**A Switch to**
Knowledge transmitter, principal source of knowledge, content provider	Learning facilitator, instructor, guide, knowledge navigator and co-learner
Teacher acts as the supreme authority of all aspects of learning	Teacher corporate with the students to acquire knowledge on their own and provide access to knowledge
Transformations of a Student's Role	
A Switch from	**A Switch to**
Acquire knowledge through teachers	Acquire knowledge by themselves under the guidance of a teacher
Reproducing knowledge	Producing and sharing knowledge, participating at times as expert
Learning as a solitary activity	Learning collaboratively with others

(Newby, 2002)

UNESCO (2002) highlights how the application of ICT could benefit the students, employers and the government. While technology can bring about a learner-centered approach, it could 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.

Table 2: Advantages of Application of ICT in Higher Education

Learners	Increased access to education Made content delivery process a bit flexible Approved the model of work & education at the same time Learner-centered approach Higher quality of education and new ways of interaction
Teacher	Improved quality of education , reduced cost of professional development Motivated teachers to increase their skills and also to increase productivity Development of a modern learning culture Increased portability of training
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

(UNESCO, 2002)

Objectives:

1. The focus of this paper is to examine the role of Information and Communication Technology (ICT) in higher education in India.

2. To explore the transformative potentials of ICT in higher education in India and also to assess the role of ICT in facilitating the growth of a nation as a whole.

Methodology:

The present study is entirely based on secondary sources of data. The secondary data has been collected from various published and unpublished sources, including, books, journals, newspapers, both national and international reports, and various online sources.

ICT in Education:

According to Leith, G.O.M. (1970), "Educational Technology is the systematic application of scientific knowledge about teaching-learning and conditions of learning to improve the efficiency of teaching and learning". ICT in education is that mode of education that incorporates the benefits and uses of information and communication technology to support, boost, and maximise the delivery of information. To cope up with the 21st century advancements, i.e., the era of technology, it is gradually becoming mandatory for the developing and underdeveloped nations to enhance the teaching skills and learning abilities through the effective implementation of ICT in the teaching learning process. The introduction of ICT in education is enabling the students of even very backward regions to get education from the best educators from the world's best universities and also offering them a chance to transform their dream into reality. It can be considered as a route to mitigate the spatial barriers involved in the teaching – learning practice. One of the most commonly quoted rationales in favour of using ICT in education is to prepare the impending generation to deal with the global standards of science and technology and also to apprehend the capability of ICT to promote the acquisition of skills and to use it as a tool for raising educational quality including a shift towards a more learner – centric approach. Learner – centred approach is the one that encourages students for self – learning instead of depending on the teacher to acquire knowledge. Inclusion of ICT was made with an ambition to promote the quality of education in the following ways –

- ***Universalization of Education:*** Access to education through an online mode of education can be accelerated by removing the Trans – boundary barriers where the student's willingness is involved to get the education. Thus, Information and Communication Technology enables the students to convert their dream into reality.
- ***Stimulus for Learning:*** ICT is a constellation of various technologies, such as, videos, television, multimedia computer software, which has deep penetration in the field of education. Insertion of these ICT tools in the canons of teaching enables the teachers to attract the attention of the students and also to make teaching – learning process more interesting.
- ***Self – Paced Learning:*** ICT enabled learning also encourages self – paced learning, i.e., a facility which allows learners to learn, anything, anywhere, and anytime according to the convenience of the learner. E – Learning or online – learning is associated with Advanced Learning Technology (ALT) and it helps to move beyond the boundaries of the traditional classroom system. The inclusion of ICT in the field of education has started providing opportunities to all those learners who want to continue with their studies but become incapable to do so because of various socio – cultural factors.
- ***Flexible Teaching – Learning System:*** ICT in education is accredited with the introduction of asynchronous learning, i.e., a form of learning characterized by a time lag between the delivery of instruction by the teacher and its acquisition by the learners. For instance, the course content is provided online to the students and students have full autonomy to receive the same at any time according to their wishes (Begum, Natesan, & Sampath, 2016).

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.

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 (Kirsebom, 1998). 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 (Schmidtlein & Taylor 2000). Pedro (2001) observes 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.

Major ICT Initiatives in Higher Education:

India has taken up major initiatives in terms of content delivery and furthering education through Information and Communication Technology. For instance Gyan Darshan was launched in 2000 to broadcast educational programs for school kids, university students, and adults. Similarly Gyan Vani was another such important step which broadcast programs contributed by institutions such as IGNOU and IITs. Under the UGC country wide classroom initiative, education programs are broadcast on Gyan Darshan and Doordarshan's National Channel (DD1) everyday. E-Gyankosh aims at preserving digital learning resource, which acts as 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.

Issues and Challenges Affecting Utilization of ICT in Higher Education:

While we glorify the role of ICT in the higher education sector, we also need to assess the problems and prospects in its implementation. Literature on ICT in education continues to project that it can help improve India's higher education system by providing greater equity, better access and improved quality. There is a growing apprehension that Information and Communication Technology can transform India towards becoming a knowledge society, but then can technology alone enhance the quality of higher education in the country? The penetration of ICT systems in higher education institutions is extremely poor according to a survey of accredited colleges by UGC in 2008 which reveals shortcomings in IT infrastructure. As the majority of Indians living in rural areas have poor access to internet, it is necessary that they are exposed and trained in basic computing skills and ICT utilization. Moreover, the low awareness on IT literacy is also a major challenge India faces in realizing ICT implementation in higher education. 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.

India's linguistic diversity necessitates the development of content in multiple languages to increase 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 problematic though not impossible. In a multi-lingual country like India, this standardization becomes even more difficult. However, this needs to be addressed immediately. As ambitious ICT based initiatives in higher education is envisioned, it is necessary to embark on a well articulated 'Action Plan'.

Conclusion:

Information and Communication Technology has no doubt brought about tremendous change in education, but we are yet to achieve the desired level of IT adoption in higher education in the country. The optimal utilization of opportunities arising due to diffusion of ICTs in higher education system presents enormous challenge. Nonetheless, it has become an indispensable support system for higher education as it could address some of the challenges facing higher education system in the country. Moreover, it can provide access to education regardless of time and geographical barriers. Similarly wider availability of course material in education which can be shared by means of ICT, can foster better teaching. While technology can influence the way how students are taught, it would also enable development of collaborative skills as well as knowledge creation skills. ICT enabled education will ultimately lead to the democratization of education and it has the potential for transforming higher education in India.

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