Information and Communication Technology in Higher Education in India: Challenges and Opportunities

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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: ICT, higher education, knowledge dissemination, research.

1. 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 (Amutabi & Oketch, 2003). India has innumerable 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. 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). 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. Besides, it can provide networking structures transcending borders and foster empowerment amongst students. But then what has been its impact in the higher educational scenario in the country?

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

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

(Table adapted from one developed by Newby et al.,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: Benefits of ICT in Education

Student	Increased access
	Flexibility of content delivery
	Combination of work and education
	Learner-centered approach
	Higher quality of education and new ways of interaction
Employer	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
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

(Source UNESCO, 2002)

2. 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.

Table 3: Type-wise classification of Universities in India.

Sl. No.	Type of Institution	No. of Institution (As on 2006)	No. of Institution (As on 2013)
1	Central Universities	20	44
2	State Universities	217	310

3	Private Universities	8	168
4	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 (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 has 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.

3. 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 which aims at preserving digital learning resourcesis a knowledge repository 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.

4. 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 cantechnologyalone 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 problemetic 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'.

5. Conclusions

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 provideaccessto 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 andit has the potential for transforming higher education in India.

References

[1] Amutabi, M. N. & Oketch, M. O. (2003), 'Experimenting in distance education: the African Virtual University (AVU) and the paradox of the World Bank in Kenya', *International Journal of Educational Development* 23(1), 57-73.

[2] Bhattacharya, I. & Sharma, K. (2007), 'India in the knowledge economy – an electronic paradigm', *International Journal of Educational Managem*ent Vol. 21 No. 6, Pp. 543- 568.

[3] Duffy, T., & Cunningham, D. (1996). Constructivism: Implications for the design and delivery of instruction, *Handbook of research for educational telecommunications and technology* (pp. 170-198).New York: MacMillan.

[4] Eriksen, T.H. (2001). Tyranny of the Moment: Fast and Slow Time in the Information Age. London: Pluto Press.

[5] ICT in Teacher **Education – A Planning Guide,UNESCO2002** Report

[6] Kirsebom, B. (1998). Universiteteni IT-aldern – frontlinjeellerbakgard?in Bauer, M. (eds.), Kraften ligger idetokanda. EtfestskrifttilStigHagstrom, universitetskansler 1992 1998, Stockholm: Hogskoleverket.

[7] Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology, Research and Development, 41*(3), 4-16.

[8] McGorry, S. Y. (2002), 'Online, but on target? Internet-based MBA courses: A case study', *The Internet and Higher Education* 5(2), 167-175.

[9] Mooij, T. (2007), 'Design of educational and ICT conditions to integrate differences in learning:Contextual learning theory and a first transformation step in early education', *Computers in Human Behavior* 23(3), 1499--1530.

[10] Oliver, R. & Towers, S. (2000). Benchmarking ICT literacy in tertiary learning settings.In R. Sims, M. O'Reilly &S. Sawkins (Eds).*Learning to choose: Choosing to learn.* Proceedings of the 17th Annual ASCILITE Conference(pp 381-390). Lismore, NSW: Southern Cross University Press.

[11] Pedro, F. (2001). _Transforming On-campus Education: promise and peril of information technology in traditional universities_, European Journal of Education 36(2), 175–187.

[12] Schmidtlein, F.A. and Taylor, A.L. (2000).Identifying costs of instructional technology in higher education, Tertiary Education and Management 6(4), 289–304.

[13] Young, J. (2002). The 24-hour professor.*The Chronicle of Higher Education, 48*(38), 31-33. Assam Tribune, Monday Jan 30, 2012