



## CONCEPTUAL MODEL FOR ICT INTEGRATION IN HIGHER EDUCATION

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### Abstract

Higher Education (HE) in India is growing massively in the last two decades. The increase in student's enrollment and growing number of stand-alone universities in India are the visible changes for HE growth. India has the third largest system of education in the world, next to USA and China. This visible growth is not possible for India to achieve, without a major catalyst called as Information Communication Technologies (ICT). The Government of India has taken major measures to overcome three challenges faced in HE – access, equity and excellence- to improve HE performance. National Commission of Education through ICT (NMEICT) is one of the initiations taken by the GOI to meet the three challenges prevailing in HE. The use of ICT tools can provide multiple digital/broadcast channels that can play a significant role in reaching out to the learners in different situations and in countries having different levels of resources. In this context, the paper tries to explore the role of ICT in HE and also provides a conceptual model for ITC integration in Higher Education.

**Key Words:** ICT, Higher Education, Conceptual Model.

### INTRODUCTION

The Higher Education sector in India has witnessed a tremendous increase in its institutional capacity since Independence. At the time of Independence of India in 1947, there were only 20 Universities and 500 Colleges in the country with 2, 00,000 students enrolled in higher education institutions [5]. In the academic year 2011-2012 the numbers have increased to 659 universities, 33,023 colleges as shown in the table 1. India now ranks second in the world, in terms of enrollment of students after China; third being USA [2]. This tremendous increase was made possible mainly due to the large number of private institutions of higher education set up by the private sector. Currently more than 60 % of higher education institutions are private institutions in which nearly 60% of the total number of students is enrolled [3]. The Indian Government has set the ambitious target of increasing the current Gross Enrollment Ratio (GER) to 30% by 2020. Over the last two decades, India has remarkably transformed its higher education landscape. It has created widespread access to low-cost high-quality university education for students of all levels. With well and a student-centric learning-driven model of education, India has not only bettered its enrolment numbers but has dramatically enhanced its learning outcomes. As a result, today, India's 70 million student population is a force to reckon with. In short, India has gone from a post-secondary education system that was nearly broken to one that is touted to be best-in-class for the 21st century world in less than two decades, and it is worth taking a closer look at how the country made this remarkable transformation.

**Table 1: Indian Higher Education**

Higher Education Institutions	Academic year 2011-12
<b>Universities</b>	<b>659</b>
Central Universities	152
State Universities	316
Private Universities	191
Colleges	33,023
Central	669
State	13,024
Private	19,930

Year	Universities	Colleges	Stand alone	Students enrollment
1947	20	500	-	2,00,000
2013	727	35000	13,000	16.9 million (2012)

Source: GoI (2005) and GoI (2013)

GoI (2005), Annual Report, Department of Education

GoI (2013), Annual Report, Department of Education

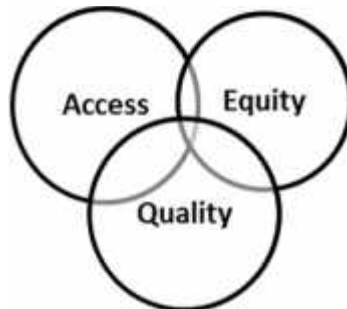
Source : Source: FICCI & EY: Higher Education in India: Twelfth Five Year Plan (2012-2017) and beyond India has emerged as a regional hub of education and attracts global learners from all over the world. By 2030, India will be amongst the youngest nations in the world and the already existing challenges for Indian higher



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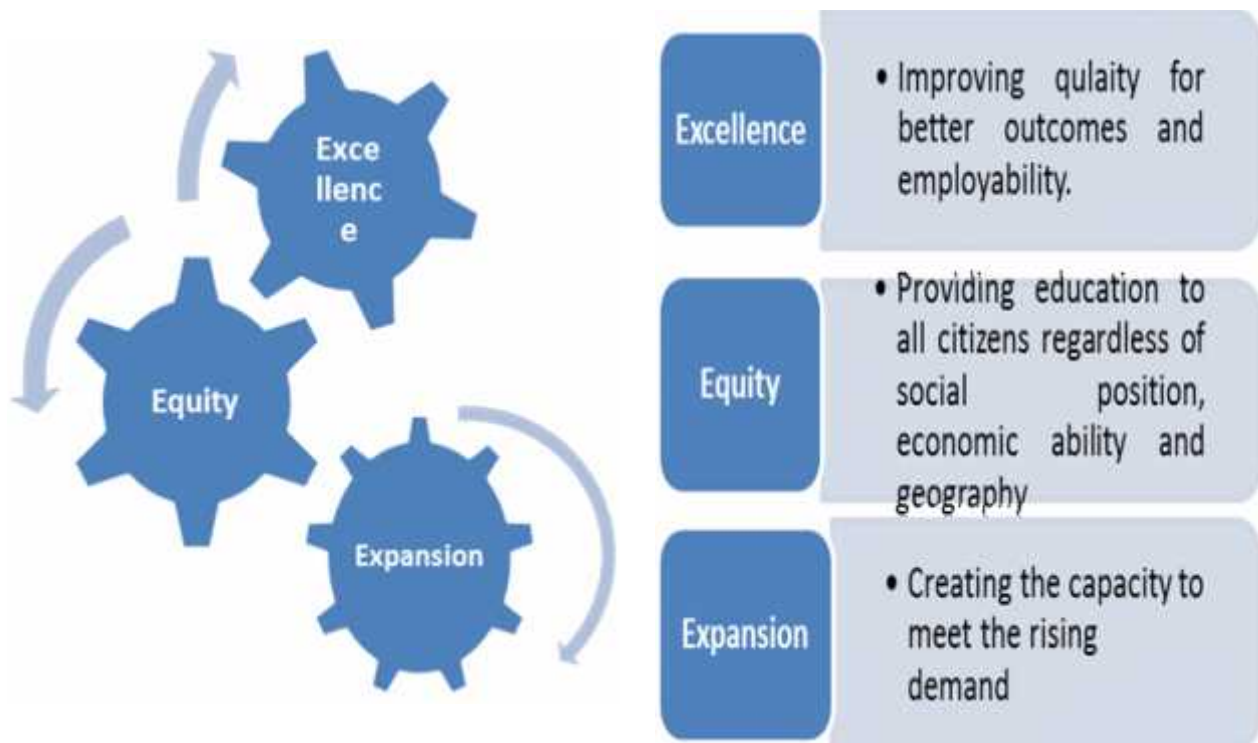
education – access, equity and quality – will only be greatly exacerbated unless we significantly transform our higher education model [2].

**Figure - 1, Challenges for Indian Higher Education**



With nearly 140 million people in the college age group, one in every four graduates in the world will be a product of the Indian higher education system [3]. Today, the median age of India’s 1.5 billion strong population is a mere 32; a good ten years lower than most other nations in the world. Today, India is the largest contributor to the global workforce, its working age population surpassing 950 million. It is no surprise then that, India has emerged to be the world’s third largest economy- an achievement underpinned, no doubt, by its unique demographic advantage, but also a prospect that would not have translated into reality if not for the country’s pioneering reforms in university education over the past 20 years .The already existing challenges for Indian higher education – access, equity and quality – will only be greatly exacerbated unless we significantly transform our higher education model. The central government operates a five-year planning cycle and the twelfth five-year plan (2013-17) for higher education addresses three overarching challenges: excellence, equity and expansion.

**Figure 2: The Three Pillars of India’s 12<sup>th</sup> Five Year Plan**



Source : Understanding India - The future of higher education and opportunities for international cooperation, 2014.



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A differentiated three distinct strategic objective – has enabled universities to build on their strengths and cater across different categories of educational needs. Further, with the effective use of technology, India has been able to resolve the longstanding tension between excellence and equity. India has also undertaken large by making teaching an attractive career path, expanding capacity for doctoral students at research universities and delinking educational qualifications from teaching eligibility. Governments and educational institutions are looking for innovative ways to increase access to higher education and improve the quality of their programmes and courses in a bid to improve their competitiveness. Given the resource and physical constraints in expanding the conventional education infrastructure, the government is increasingly looking at technology as a means for expanding access as well as maintaining quality. While the positive impact of information and communication technology (ICT) in the areas of delivery and collaboration has been long established, higher educational institutes are increasingly experiencing the benefits of using IT tools for student and administrative management.

### **INFORMATION AND COMMUNICATION TECHNOLOGY IN HIGHER EDUCATION**

Technology constitutes the core component of learning in higher education. And in this context, Information and Communication Technology (ICT) has become a hot cake for higher education institutions around the world. According to Bush (McOmber, 1999), ‘technology is a form of human cultural activity that applies the principles of science and mechanics to the solution of problems. It includes the resources, tools, processes, personnel, and systems developed to perform tasks and create immediate particular, and personal and/or competitive advantages in a given ecological, economic, and social context’. (ICT) is basically an umbrella term that encompasses all communication technologies such as internet, wireless networks, cell phones, satellite communications, digital television etc. that provide access to information. The growth of information technology (IT) such as computers and the Internet continue to change our everyday life. The government is spending a lot of money on ICT. In the higher education sector, the National Mission on Education is emphasizing on the role of ICT in increasing the enrolment ratio in higher education. India is developing as a knowledge economy and it cannot function without the support of ICT. 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. While the positive impact of information and communication technology (ICT) in the areas of delivery and collaboration has been long established, higher educational institutes are increasingly experiencing the benefits of using IT tools for student and administrative management [3]. The various technology enabled learning initiatives are taken by Government of India. The National Mission on Education through Information and Communication Technology (NMEICT) has been envisaged as a centrally sponsored scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time anywhere mode. The three cardinal principles of Education Policy viz., access, equity and quality could be served well by providing connectivity to all colleges and universities, providing low cost and affordable access-cum computing devices to students and teachers and providing high quality e-content free of cost to all learners in the country.

### **ICT INTEGRATION IN HIGHER EDUCATION**

Information and Communication Technologies (ICTs) is a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information. This broad definition of ICT includes technologies as radio, television, video, DVD, telephone, satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail (UNESCO, 2002). ICT helps in enhancing the quality of education through blended learning by supplementing the traditional talk and chalk method of teaching. If used creatively, can make a big difference in the way teachers teach and students learn and can help students acquire 21st century skills like digital literacy, innovative thinking, creativity, sound reasoning and effective communication. Role of ICT act as an enabler for quality and market-responsive in higher education. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audio cassettes and CD ROMs etc have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007). Today, technology of education is being developed with the aim not only of making education more widely available, but also of improving the quality of education which is already available. Fluck (2003) defines the term integration



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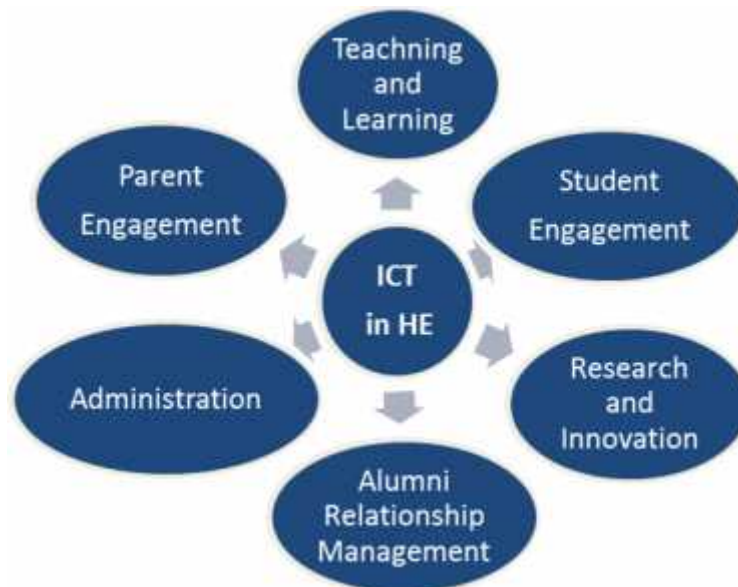
with the degree to which “ICT vanishes into the background of the classroom learning activity”. Lloyd (2006) suggests that the term ICT integration connotes a wide variety of learning environments; from a single personal computer in the classroom to a situation where the teaching is done by the computer through online applications. For Fluck and Lloyd the integration of ICT is not a focus on the technology but more about the pedagogical means through which the technology is employed in the classroom. Bottino (2003) and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn (Yuen *et al*, 2003). Casal (2007) mentions that ICTs also provide a platform for sharing information and knowledge. This can be used for the betterment of program delivery in terms of replication of best practices. It also helps researchers by provision of information, networking, online journals, libraries and data. The possibility of real time interaction in all the different aspects of the education system like teaching, collaboration, debates etc., hold great promise for the future (Mason, 2000). Wiles (2010) inform that new technologies, particularly web sites, have been readily adopted in the admissions, marketing and communications functions of universities. Bhattacharya *et al.*,(2007) explains that use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems. Fleck (2007) supports that integration of computers and communications offers unprecedented opportunities to the education systems with its capacity to integrate enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The growth of these communication and computer systems, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom. Michael Thoma *et al.*,(2012) illustrate that applications of ICT have stimulated developments in e-learning more as support mechanisms than disruptive technologies. Balasubramaniam(2009) in Ulka Taro(2012) informs that success of ICT-based education depends upon the teacher's ability to keep pace with the developments since teachers are responsible for quality control, improvement of learning and the aggregate effectiveness of the learning process.

### **CONCEPTUAL MODEL FOR ICT INTEGRATION IN HIGHER EDUCATION**

Research findings show that technology can support pedagogical, curricular, and assessment reforms, which intend to support the process of knowledge creation. Students and teachers plan their learning activities and build on each other's ideas to create new knowledge. ICT provides new opportunities for higher education curriculum, including facilitating teaching and learning, internationalization of curriculum, its enrichment, social networking, virtual curriculum, mobile learning etc. The figure 3 shows a conceptual model for ICT integration in the Higher Education for various aspects and by various stakeholders of it based on the literature support. Faculty uses PPT, Word processing, audio-video visual, generates e-contents for teaching processes and also uses email to communicate with the students, Moodle platform provides an interactive platform for teachers and students to share their information. The use of social media in higher education classrooms is on the rise as faculty employs a variety of software tools and free web applications to enhance learning, communication, and engagement. social media is the arena where users can “engage in the creation and development of content and gather online to share knowledge, information, and opinions using web-based applications and tools” (Grover & Stewart, 2010, p. 9). Web 2.0 technologies such as blogs, wikis, podcasts, social networks, and virtual worlds have become popular and are gradually making their way into the classroom. Students can be continuously engaged with the help of ICT tools; to be more specific, social networks provide a greater platform to faculty and students for their innovative approach of teaching-learning process. ICT tools also helps faculty in their research and innovation processes. Social networks assist the faculty to identify their research community based on their area of research and they share their knowledge with their community scattered all over the world. Technology has brought the entire world to function in a much closer network. Higher Education institutes make use of emails, e-circulars, intranet portal to access and to provide information to staff at rapid speed. Student's information like attendance, results, payment details, etc., is also made available to parents over online. Higher education has also started with online admissions and their individual web portal helps them for this process. To make use of the technology driven community, web portal is one of the major tool to reach the student community and other users all over the world.



**Figure – 3, Conceptual Model for ICT Integration in Higher Education**



Higher Education have started realizing essentials of alumni relationship to bridge the gap between industry and academic, few Indian stand-alone university have initiated an interactive web portal among the students and alumni for open discussions on various topics. Students make use of ICT for effective learning process, where ICT benefits them to access the e-content available for 24 hours a day and 7 days a week, video conferencing helps them to access the faculty from any geographical location and internet assist them to update with current changes happening in the market. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners.

## CONCLUSION

The conjoining of the terms 'literacy' and 'digital' will open up our thinking on how to better develop our students' academic capabilities in the 21st century learning environment, and give them critical capabilities they need in this new paradigm of digital education. Times belong to multi-channel learning. We must speak of the 'expanded vision' of higher education that surpasses the present resource levels, institutional structures, curricula and conventional delivery systems while building on the best in current practices. Multi-channel learning offers a strategy for enhancing educational access, quality and equity as it caters to the needs of diverse groups of students whose needs cannot be met through one single channel. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).

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