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Enhancing the quality of education through ICTs in India

[1] Marichamy K, [2] Thangamariappan J

[1] Principal Investigator (UGC-MRP), Assistant Professor, Department of Economics, NMSS Vellaichamy Nadar, College, Nagamalai, Madurai, Tamil Nadu, India

[2] Assistant Professor, Department of English, NMSS VellaichamyNadar, College, Nagamalai, Madurai, Tamil Nadu, India

Abstract
Education as a tool for social change necessitates incorporating changes in the methods of dissemination of knowledge to synchronise with emerging trends in all sectors of life. According to a World Bank report, disparities in the levels of ICT readiness and use could translate into disparities in level of productivities and hence could influence a country's rate of economic growth. Understanding and leveraging ICT is therefore critical for countries striving for continued social and economic progress. Hence, the necessity for Information and Communication Technology (ICT)-based resources to be embedded in educational systems to facilitate students to be acquainted, familiarised and skilled in such tools and environments. But this is a mammoth task and policies, programmes and initiatives are to be taken for this. This paper discusses some of the initiative and tries to mark out certain key areas which pose a great challenge to all the stake holders in higher education.

Keywords: ICT, Education, Initiatives, Challenges, Teacher, Infrastructure

Introduction

India's higher education system is one of world's largest, enrolling nearly 22 million students in more than 46,000 institutions. The system's rapid and recent expansion has increased concerns about declining quality, however. Reinforcing these concerns are poor infrastructure, underprepared faculty, unwieldy institutional governance, and other obstacles to innovation and improvement. The major teaching and learning challenges facing higher education revolve around student diversity, which includes, amongst others, diversity in students' academic preparedness, language and schooling background. Education is perhaps the most strategic area of intervention for the empowerment of girls and women in any society and the use of information and communication technologies (ICTs) as an educational tool in the promotion of women's advancement has immense potential. The application of ICTs as a tool for effective enhancement of learning, teaching and education management covers the entire spectrum of education from early childhood development, primary, secondary, tertiary, basic education and further education and training. Integrating ICT in teaching and learning is high on the educational reform agenda. Often ICT is seen as indispensable tool to fully participate in the knowledge society. ICTs need to be seen as "an essential aspect of teaching's cultural toolkit in the twenty-first century, affording new and transformative models of development that extend the nature and reach of teacher learning wherever it takes place" (Leach, 2005). For developing countries like Vietnam, ICT can moreover be seen as a way to merge into a globalizing world. It is assumed that ICT brings revolutionary change in teaching methodologies. The innovation lies not per se in the introduction and use of ICT, but in its role as a contributor towards a student-centered form of teaching and learning. 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. It is the processes, tools and techniques for: 1. gathering and identifying information 2. Classifying and organizing 3. Summarizing and synthesizing 4. Analysing and evaluating 5. Speculating and predicting 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. ICTs can improve the quality of education in a number of ways: By augmenting 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-cantered. ICTs which can be in the form of videos, television and also computer multimedia software, that merges sound, transcripts and multicolor 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 radio on the other hand through its interactive programs utilizes songs, sound effects, adaptations, satirical comedies and supplementary collections of performances so as to induce the students to listen and get drawn in to the training that is being provided. 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.

ICT in Teaching

Academics have taken to the use of computer in teaching much more readily than they adopted earlier audio-visual media. This is because the strength of computers is their power

to manipulate words and symbols - which is at the heart of the academic endeavor. There is a trend to introduce eLearning or online learning both in courses taught on campus and in distance learning. Distance education and eLearning are not necessarily the same thing and can have very different cost structures. Whether eLearning improves quality or reduce cost depends on the particular circumstances. ICTs in general and eLearning in particular have reduced the barriers to entry to the higher education business. Countries and those aspiring to create new HEIs can learn from the failures of a number of virtual universities. They reveal that ICTs should be introduced in a systematic manner that brings clarity to the business model through cost-benefit analyses. ICT according to a number of commentators, enhance teaching, learning, and research, both from the constructivist and instructivist theories of learning. Behind this increasing faith in the role of technology in higher education however, lies implied acceptance of technology by various commentators, either as neutral and autonomous, neutral and human controlled, autonomous and value laden, or human controlled and value laden. In many countries, demand for higher education far outstrips supply and Governments and institutions are turning more and more to the use of ICTs to bridge the access gap. It is too early to say whether the role of ICTs in the teaching function of higher education is truly transformative, or whether it is simply a repackaging of previous pedagogy. ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. Effectiveness, cost, equity, and sustainability are four broad intertwined issues which must be addressed when considering the overall impact of the use of ICTs in education. The educational effectiveness of ICTs depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery, ICTs do not work for everyone, everywhere in the same way. The constitution of the United Nations Educational, Scientific and Cultural Organization (UNESCO) was adopted by 20 countries at the London Conference in November 1945 and entered into effect on 4 November 1946. The main objective of UNESCO is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication in order to foster universal respect for justice, the rule of law, and the human rights and fundamental freedoms that are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations.

UNESCO's principles on ICT in education can be summarized as follows

1. Old and new technologies need to be used in a balanced way. On-the-air and off-the-air radio/radio-cassette, television and offline video-assisted technologies are still considered valid and cost-effective modes of education delivery, as important as more interactive computer/Internet-based virtual education or online distance learning.
2. Meeting the international education goals by 2015 will require huge investments in teacher training institutions.
3. The demand for higher education cannot be met in both the developed and developing world without distance or virtual modes of learning.
4. Vocational training needs cannot be met without virtual classes, virtual laboratories, etc.
5. Educational goals cannot be met without gender sensitivity. Wherever possible, the proposed indicators will address the need to measure the gender gap.

However, as educational resources, printed texts were and still are the most accessible, both in terms of cheap availability as well as popularity all across the world, and are in no threat of being upstaged, as the book continues to remain the chief and most powerful visual symbol of education. The Government of India assessed the importance of the ICT intervention in education as early as 1984-85 with the introduction of Computer Literacy and Studies in Schools (CLASS) as a joint venture of the Ministry of Human Resource Development in collaboration with the Department of Electronics, wherein 12000 secondary and senior schools were beneficiaries. This project was later on adopted as a centrally sponsored scheme during the 8th Five Year Plan (1993-1998), and beneficiary institutions increased in number and were provided financial assistance for purchase and maintenance of computers, text books as well as provision for computer instructors. The National Policy on Education (NPE), 1986 did not specifically mention the use of ICTs for promoting primary and secondary education, but the 1992 Programme of Action (POA) on NPE stressed the need to improve access to computers in schools. This move was followed by the constitution of the National Task Force on Information Technology and Software Development (IT Task Force), by the Prime Minister in 1998 that introduced certain attractive schemes such as Vidyarthi Computer Scheme, Shikshak Computer Scheme and School Computer Scheme to inspire and initiate both teachers and the taught to make themselves tech-savvy. These schemes were supported by a suitable cache of initiatives such as lowering the cost of PCs, easy instalment bank loans, computer donations by IT companies and other business houses, bulk donations of computers by NRI organizations and individuals, large-volume bargain price imports, multi-lateral funding, etc. Computers and Internet was to be made accessible to schools, polytechnics, colleges, and public hospitals in the country by the year 2003. Though this initiative failed to make a comprehensive impact, yet the concept of SMART Schools attracted the attention of many schools and higher educational institutions such as colleges, universities where the emphasis was not only on Information Technology in Schools, but also on the use of skills and values that will be ultimately beneficial to all stake-holders.

The Sarva Shiksha Abhiyan (SSA)

Education for All Movement is a programme by launched by the Government of India that aims to universalize of elementary education in a time bound manner, as directed by the 86th amendment to the Constitution of India making free education to children aged 6–14 (estimated to be 205 million in number in 2001) a fundamental right. SSA is being implemented in partnership with State Governments of the country to address the needs of 192 million children in 1.1 million habitations. Beside opening new schools in those habitations without schooling facilities and to strengthening existing school infrastructure through provision of additional class rooms, toilets, drinking water, maintenance grant and school improvement grants, the SSA also provides additional teachers in existing schools with inadequate teacher strength. Capacity-building of existing teachers is also being initiated by extensive training, grants for developing teaching-learning materials including supplementary teaching resources in digitalized form, and strengthening of the academic support structure at a cluster, block and district level. SSA seeks to provide quality elementary education including life and value-education skills. Most importantly, SSA specially focuses on education and empowerment of the girl-child and children with special needs. SSA also seeks to provide computer education to bridge the digital divide. Among the first ICT resources to be used in India was the radio, where educational programmes started being broadcast as far back in 1937, known as the School Broadcast Project, simultaneously from Delhi, Bombay, Calcutta and Madras. However, due to regional disparity in school curricula, this project was not successful in the long run. However, as Jaminson and McAnany (1978) stated, the three main strengths of radio are a) improving education quality and relevance, b) lowering educational costs, and c) improving access to educational inputs, particularly to disadvantaged groups. After independence, radio proved to be a major educational resource medium for promoting adult education and community development, beside farm and home-broadcast topics. The University Broadcast Project started in 1965 and the Language Learning Project started in 1979-80 were worthy precursors of the next chain of radio-programmes that were adopted by IGNOU as part of their distance learning, the IGNOU-AIR Broadcast and the IGNOU-AIR Interactive Radio Counselling. In November, 2001, GyanVani, an FM Radio channel started functioning as media operatives, with day-to-day programmes contributed by various ministries, educational institutions and NGOs. EDUSAT, the first Indian satellite designed and developed exclusively for serving the educational sector was launched by the Indian Space Research Organisation (ISRO) in September, 2004. This system was primarily for school and college education, but beside the formal sector, it was also supposed to support the non-formal educational sector. Meanwhile, the Information Technology Act 2000 emphasized technical higher education, so that students would get better placement opportunities in the emerging IT sector in India. This also was bolstered by the Science and Technology Policy 2001 that called for the teaching of science at school and college levels.

The launching of INSAT, INSAT-1A and INSAT-1B were important milestones in the promotion and development of ICT in educational sector. The Information Technology Policy 2005 recognized the strategic importance of ICTs as key components of socio-economic development, governance and enhanced service-delivery. Additionally, the policy also called for improvement and spread of education to achieve computer literacy among students. The VISION 2020 programme, initiated by President APJ Abdul Kalam, encompassed a holistic development module that included integrated information technology tools with a sustainable environment-conscious approach to education. The Ministry of Human Resource Development (MHRD) also undertook took several long-term strategies to ensure spread, development and optimization of ICT tools in Indian classrooms, integrating them with traditional frameworks of knowledge-dissemination. In measuring indicators for sustainable information societies, the United Nations Commission for Science and Technology for Development (UNCSTD) for instance, includes experience, skills, and knowledge as critical components in the development of information societies aside from infrastructure. The University Grants Commission also instituted several schemes, such as the setting up of Network Resource Centres in higher education institutes to encourage universities, colleges, and other learning institutes to promote better incorporation of ICT in curricula to prepare the next generation of citizens for better adaptation in IT environments. State governments have also come forward to inculcate ICT knowledge and skills among students. The Government of West Bengal has initiated a number of projects for computer skill development among students of school and college levels, as part of their vocational education curriculum, along with a broad-based computer awareness and training programme for disadvantaged groups (SC,ST, OBCs, minorities) as part of their social welfare objectives. The Karnataka state government had started a fully-state financed computer education and computer-aided education project for students of classes VIII-X, under the MahitiSindhu project, since 2001.

Most recently, the National Mission on Education through Information and Communication Technology (NME-ICT) seeks to holistically change the educational environment of the country by an aggressive campaign to introduce ICT-enabled education in India, by assuring network access to remote corners, development of quality e-content, as well as empowering student-community by providing low-cost tablet PCs, named Akash. This project is one of the most prestigious projects undertaken by MHRD, in collaboration with different IITs, particularly IIT Mumbai, and the telecommunication major, Bharat Sanchar Nigam Limited (BSNL). NME-ICT is not oriented towards school and college/university-level education, but also ambitiously aims at providing more than 50 crore working population with a one-stop solution for all their learning-needs. One of the prime objectives of this mission is effective utilization of intellectual resources, minimizing wastage of time in scouting for opportunities or desired items of knowledge appropriate to the requirement. Addressing the NME-ICT South Zone meeting on December 23rd 2011 through Amrita University's award winning e-learning platform A-VIEW (Amrita Virtual Interactive E-Learning World) from MHRD's New Delhi office, MHRD Additional Secretary, Shri NK Sinha, in his Key-note address stated the government of India's objectives of this flagship programme and emphasized that quality content, high-speed connectivity and proper devices are vital to the success of this mission. He highlighted that the support of all educational institutions in the country is necessary to generate quality content, and re-iterated that now learners can avail content free of cost from Sakshat

website, www.sakshat.ac.in. Broadband connectivity is being ensured in all institutions under the NME-ICT mission. At present, around 250 Universities have been using 1 Gbps connectivity on optical fibre. Govt. of India has been providing 75 per cent of the total cost to the educational institution to set up connectivity. Hence they only have to invest 25 per cent. He added that the MHRD has ordered BSNL (Bharat Sanchar Nigam Ltd) to deliver Akash tablet while providing connectivity also. Stressing on the need to complete LAN connectivity work, he pointed out that unless institutions across the country wake up to the necessity of ICT, it would be difficult to allocate funds for them under the 12th Plan period. The point that is to be noted in this connection is that the government is taking major initiatives in the implementation of ICT, yet it still recognizes the fact that there are still some innate challenges that calls for immediate attention and action. Yet, the silver lining is that some institutions such as the Amrita University with multiple campuses in South India is making vigorous headway in this regard. Currently, a dozen of online programs are being aired through Amrita University's multipurpose e-learning platform A-VIEW. Online Gurukul, a pioneering initiative meant for Arts & Science college students in Kerala is held every Tuesday. National Weekly discussions between Universities are scheduled on Wednesday while 'Ask a Question' is conducted on Thursday. Apart from these, national workshops as part of 'Talk to a Teacher' program are also transmitted through A-VIEW. Another feature that obviously calls for attention is the address of the Additional Secretary, Shri Sinha, through video-conference, which was a visible proof and symbol of the governmental conviction and initiative on the facilitation of ICT tools to every corner of the country.

However, an overview of the ICT policy initiatives of the Government of India as well as state governments, will reveal that though there have been considerable progress in incorporation and institution of ICT tools in education programmes, there is still a huge abyss between the initial projected progress and hard reality. The policy processes are sometimes too complex and fantastic to be implemented in the existing framework. Often there is a lacuna between the development rhetoric and its translation into practice. The essentially theoretical approach to implementation of this progressive strategy, without taking into account several practical parameters, is the basic error that hinders successful action. This is complemented by the grossly ambiguous and flawed computing in formulation of educational policy and discourse, simply because of a third, very important parameter – the absence of a clear direction and purpose that contributes to the undermining of the effectiveness of all policies dedicated to educational reform and development.

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