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Title

SUSTAINABLE DEVELOPMENT THROUGH ICT AND EDUCATION – A COLLABORATIVE ENDEAVOUR

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Introduction:

ICT Information and Communication Technology plays an important role in enabling participatory education, covering wide areas, vast distances and most important eliminating discrimination in education. Among the developing countries India has achieved a significant position in the development of ICT and is taking slow but steady strides in promoting ICT enabled education in India. ICT is an extremely powerful enabler in providing sustainable development to all countries around the world. It is one of the most rapidly developing technological field providing speed and convenience to mankind. Education has always been accepted as the prime source for bringing about awareness, improving knowledge base and leading to enlightenment. Benefits achieved from the synergy of ICT and education can bring about a revolution in the field of knowledge. Economic and social developmental mileage achieved by the countries which reaped the synergetic benefits of ICT and education stand as an example before the world. However we are still surrounded by widespread poverty, illiteracy and economic and social inequality. A major gap exists between the affluent societies which have access to modern ICT and the under privileged population of the less developed countries. An unequal availability of technology, excludes many countries from availing the developmental benefits of ICT.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) describes the term information and communication technologies (ICTs), as: 'the tools and the processes to access, retrieve, store, organise, manipulate, produce, present and exchange information by electronic and other automated means' (UNESCO Bangkok, 2003). Any kind of technology can be understood as a tool or technique for extending human capacity. In this sense, the UNESCO description of ICTs suggests, ICTs extend our human capacity to perceive, understand and communicate. Education is the driving force of economic and social development in any country (Cholin, 2005, Mehta and Kaha, 2006). The use of latest technology in education can make quality education accessible and affordable to all, thus resulting in social and economic growth of the state. All country heads recognize the growing importance of ICT on their economies and societies.

They are aware that ICT intervention in education can be a powerful enabler in creating positive and sustainable development in the country and a work force empowered with ICT skills and

knowledge will drive their nation into the global e-economy. If a country is keen to develop technically skilled workforce, it will have to prepare its educational institutions, educational trainers and students to effectively use ICT.

However, "Centuries of development in education have not been able to avoid that, nearly one billion people in the world are illiterate, more than 130 million children don't attend school, and many of those who do, acquire knowledge that doesn't sustain them or is irrelevant for their needs. There is a clear indication that yesterday's solutions are inadequate for today's problems, and there couldn't be a clearer signal that doing more of the same is not a valid solution." explains Visser (1997, p.2).

Indian educational canvas is large diverse and complex with more than 1.2 million schools spread over 600 districts across 35 states and union territories. In the Indian federal system, education is a subject addressed by central, state or provincial governments. Hence the resultant picture is that of central government, district and state authorities, working in tandem or independently of each other, thus making implementation of changes (like inclusion of ICT) in the existing system extremely difficult. Globally, there has been an unprecedented revolution in the advancement of ICTs. Since 1980s, a dramatic shift is observed in terms of access to ICT by the public at large. Amongst the developing nations India has achieved a significant position in the development of ICTs and is recognized as the global leader in the knowledge economy. Yet, more than half of its population continues to be illiterate. Thus, a picture of major contradictions emerges as urban India has problems of excesses and the rural India of deprivation. Implementing ICT in education, in all earnest is the only solution to this challenge.

The Significance:

Education is the key to achieving sustainable development. Research conducted by Paas (2004) finds that many changes called for in Sustainable development could be supported through integration of ICTs into the learning environment. Integration of ICT with education facilitates sustainable development in two ways:

1. ICT enables increased access of education material, covering large population, vast distances while excluding biases of formal education system.

2. Further it promotes new methods of interaction which is essential for sustainable development

The traditional formal education system was based upon the approach that knowledge should be instructed, with very little emphasis given to imparting actual experience to the learner. Further the content presented to the learner was unrelated to the daily reality and since the learners do not gain experience, they were unable to effectuate change. The traditional approach does not enable people to connect with the impact of their action on the planet hence, they continue to create and provide unsustainable solutions. Whereas, any learning situation which intends to give people the ability to deal effectively with reality of the world should be problem-based and task-oriented, and should provide opportunities for interaction, collaboration and connectivity (Visser 1997; 1999). Only such experience based learning system will impart sustainable education. "The traditional theories are learner-centered, while today's society needs a collective centered learning theory" (Siemens 2005). Siemens presents a learning theory for the digital age called 'connectivism' which incorporates the ideas of chaos and unpredictability that govern today's society. ICT integrated learning supports the collective centered learning system which is propagated through the theory of connectivism.

The Global Scene:

There is a dire need to jump the gap between theory and the real world. ICT based education promotes collaboration, connectivity, experience based learning and systems thinking which is essential to educate for sustainability. The web provides extensive links for educators to exchange knowledge, read and publish articles and prepare upgraded lecture plans. The CSL project is an excellent example of sustainability being facilitated by ICT. Community Service Learning (CSL) is an educational approach which integrates service of the community with learning activities. Through CSL the members of educational institutions and community organizations work together towards outcomes that are mutually beneficial. Like at the Galapagos islands 23 students provided 20 hours each of community service to analyse the electric grid to determine the potential to reduce electricity demand through energy efficiency (Solar Quest, 2004). Further in the area of sustainable development and environment awareness,

there is Environment online (ENO) a global virtual school and network based in Finland, which has approximately 400 participating schools from 104 countries.

The application based learning is emerging effectively in the adventure education. While seated in the classroom the students are able to follow real-world scientific discoveries of the researcher, for example by following the exploration of the jungles of the Congo (http://www.nationalgeographic.com/congotrek) and feel the excitement of crossing the Artic in search of environment data and interaction with local communities (http://www.polarhusky.com). The International Education and Resource Network iEARN is an NGO made of over 20,000 schools and youth organizations in more than 115 countries. It empowers teachers and young people to work together online using the internet and other new communications technologies. Over 10,00,000 students each day are engaged in collaborative project work worldwide. ICTs are increasingly being deployed as learning support tool in the classroom. Several universities have effectively used internet and computer systems to connect researchers for email and data exchange.

The area of education where ICTs are currently most applied is 'Distance Learning' (DL). Many professional online learning platforms offer highly sophisticated communication tools which enable face to face training sessions thereby avoiding long distance travel time and cost. Through online learning programmes the instructor can ineract with distantly placed students, invite experts via video conference and chat, show presentations, apply polls and avail instant results. Distance learning is seen as very important for achieving Education for Sustainable Development because it can help to facilitate the access and reach of sustainable development content to a large number of learners at a time. With the advent of blogging and tools such as Wikipedia, young people are able to seek quick feedback from their peers and between experts and amateurs, friends and mentors.

The Indian Scenario:

India actively promotes the use of ICTs in education in the formal and non-formal education sector for the last 50 years. Since 1950s, Indian policy documents have identified the need to use all media for promoting development through education. Since then the radio and television as medium of mass communication, has been extensively used to spearhead the agricultural and

milk production revolution in the rural areas. EDUSAT the broadcast education satellite, with 70 channel capacity is used by all state governments and publicly funded educational institutions to transmit educational programs to their target audience. A Task Force on Human Resource Development in Information Technology was set up, which set out a number of recommendations to create a sustainable competitive advantage for India to maintain its global leadership position in knowledge led businesses. Some of the recommendations include, identifying and developing institutions of excellence, promoting technology mediated learning, supporting capacity-building initiatives for faculty, curriculum and content development, promoting public private partnership. There has been a significant shift, since the 1980s in terms of access to technology by general public. Deregulation of the airwaves and the telecommunication sector has impelled the revolution in basic telephony and internet services. Technologies like Wireless in Local Loop (WLL) and Very Small Aperture Terminal (VSATs) are being used for internet and intranet. The government has played an active role in facilitating availability of ICTs in large parts of the country. The launch of Gyan Darshan a satellite-to-cable educational channel and Gyan Vani a educational raido project cater to the poor and try to reach the unreached.

In the area of providing skill based education public private partnership has played a decisive role in India. The Government of Andhra Pradesh in partnership with TCS provides literacy to the poorest districts of the state through the portal Tataliteracy.com. Project Vidya, a partnership between the government of India and Intel, provides quality educational input to selected government schools throughout the country by providing ICT access and training to students and teachers. Amongst the most successful public private partnership is the Hole in the Wall project of the NIIT. This project aims to spread computer literacy and use of internet technologies in urban slums. The project has successfully covered several urban slums in the country. Another noticeably effective public private initiative between Karnataka Government and Azim Premji Foundation has set up community learning centre and has demonstrated that technology enabled learning helps in motivating children and increasing the interest levels in mathematics, geography etc., and thereby improving school retention rates.

The Challenges:

However, despite all the activity, certain parts of India like Orissa, Bihar, interior parts of Maharashtra, Jammu & Kashmir still continue to lag behind in effectively harnessing the benefits of ICT in education. There are several constraints which stall Indian government's efforts in effectively implementing ICT in education all over the country.

1. Government commitment and policies exist in full earnest, however the thrust is missing at the implementation level.
2. The major obstacle in ICT project implementation is providing for basic facilities like electricity, telephony and connectivity.
3. Insufficient access to computers is also a major hurdle in ICT based education programs.
4. Often overlooked by policy makers, monitoring and evaluating ICTE projects is critical to ensure that these projects are making the intended impact and will be sustainable in the long run.
5. The centralized model is incapable of developing educational materials incorporating local requirements i.e linguistically and culturally relevant, to different regions. Whereas a decentralized model seems to overlook the financial benefits achieved by the centralized plan due to economies of scale.
6. Most of the projects are either built on donor money or government subsidy. Depending on lifelong government support and lack of building a revenue model leads to short term success of projects.

Suggestions:

The governments which aim for sustainable and equitable growth will have to give highest priority to extending education facility to one and all. Developing a knowledgeable human capital in the country will require formulating active and transformative education policy. ICT can play a vital role in creating a vibrant education sector by increasing access and providing better quality education. The ability of ICT to transcend time and space allows learning to take place 24x7. ICT based education contributes immensely to the inclusion of traditionally excluded population such as girls and women, disabled persons and previously marginalized

groups due to cultural, social and geographical circumstances. An increased access to education, for these sections of society leads to sustainable development of the country.

1. Government policies need to be developed in tandem and at multiple levels. They need to be adjusted with those at the state, district and school levels, so that the adoption and implementation of the policy is in full spirit.
2. The ICT education program should be region specific and locally driven, (learning material be developed in local language) or else it may risk further isolation of the deprived population rather than promoting inclusive social development.
3. The job market today demands specific and advanced skill orientation, hence the teacher centered pedagogy needs to shift to an active, collaborative and interactive learner centered method which is facilitated by ICT.
4. New technologies cannot be imposed without enabling teachers and learners to understand the fundamental shifts. Ongoing training is necessary for the trainers and educators who are involved in designing and teaching the ICT enabled curriculum.
5. Middle level managers both in the public sector and NGOs need to understand the pedagogy of learning through ICT and the consequent management models required.
6. Appropriate indicators must be identified for every project, such that each project can be monitored in order to effectively track progress. Further, stakeholders at all levels must be a part of this process to ensure transparency.
7. Sustainable public private partnerships must be built to control cost and tone down the complexities of integrating ICT with education. Due to high costs, investments must be made strategically i.e. after careful planning, finding creative ways of financing and creating networks and synergies.
8. An active and sincere commitment and involvement of government is critical to source regular investments for ICT infrastructure provision, to integrate ICT in education and to facilitate widespread dissemination of educational materials.
9. Community participation and partnership in the projects will ensure sustainable implementation and overall support.

10. In many projects in India poor electricity supply has come up as a major obstacle in the success of the project. Hence, alternative sources of energy should be explored.
11. There is a need to develop a business like self sustaining revenue model for the project, considering user charges or any such revenue inflow.

Conclusion:

A study conducted by the International Institute for Communication and Development (IICD) indicated that 80% of its participants felt more aware and empowered by their exposure to ICT in education, and 60% stated that the process of teaching as well as learning were directly and positively affected by the use of ICT. The countries in Asia, that have the most mature and highly developmental ICT in education policy are the more robust economies such as Australia, the Republic of Korea and Japan. These countries have comprehensive policies, implementation strategies, measurement indicators and have committed resources to provision of infrastructure, access and connectivity, training and learning, software development. In the current information and communication led society the life span of knowledge has been considerably shortened. There is a need to continuously keep pace with the latest knowledge developments via ICT. Education today, plays an even more important role in the social and economic development of the country. If a country is keen to develop technically skilled workforce, it is essential that students in schools and higher education level are taught to use ICT as an inseperable part of the curriculum.

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