THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY FOR ENHANCING QUALITY AND ACCESSIBILITY IN EDUCATION

Dr. Sangeeta Sahni Kohli[1], Dr. Ritu Bhattacharyya[2], Mr. Kamalesh Kohli[3]

[1]S K Somaiya College of Arts Science & Commerce, Vidyavihar, Mumbai (India)
2Director, Indira Institute Of Management, (India)
3Software Engineer, GE Oil & Gas, (India)

ABSTRACT

The challenge of developing nations is to provide education to all and it continues to be a struggle especially in the rural areas. Globalization and technological change—have created a new global economy "powered by technology, fueled by information and driven by knowledge (Victoria L. Tinio 2003) In such a scenario schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Schools must promote "learning to learn, i.e., the acquisition of knowledge and skills that make possible continuous learning over the lifetime (Thornburg, David 2000) ICT integrated learning facilitates the shift from content centered curricula to competency based curricula and from teacher centered learning to student centered. The paper basically aims to view ICT in education from two perspectives, first: ICT integrated learning and its potential to actualize competency enhancing education, second: The role of ICT based education in fostering inclusive growth towards sustainable development. In our resource constrained economy it is imminent that the policy makers give due importance to implementing ICT based education to facilitate easy and affordable access to education in the remote areas and to the masses and enable teaching learning as an engaging, active process.

Keywords: **ICT, Inclusive Growth, Competency Based Learning, Affordable Access, Student Centered Learning**

I. 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. Education is the critical factor that will empower the youth to participate in the national growth process. (Sangeeta S. 2012) Tinio defines ICT as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information (Tinio 2009) 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. Countries which reaped the synergetic benefits of ICT and education stand before the rest of the world as a clear example of Economic and social development. India has a massive 1.2 billion population (Census, 2011) of which a high proportion of them are young. (Sangeeta S. 2012) 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) The 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) (Sangeeta S 2012). Any kind of technology can be understood as a tool or technique for extending human capacity. The pervasiveness of information technologies has changed the way people live work and play. It has significantly reduced cost of communication and transportation. These changes have not only resulted in worldwide economic growth but also considerable social turmoil and dislocation. It has created tremendous stress on the educational and social systems which are responsible in moderating adverse impact of social and economic change. In the face of these trends there is a need to rethink the education policy such that it ensures equitable benefits of developments to its citizens. The strategy of inclusiveness calls for broad based participation in the development process through a new emphasis on education. Inadequate access to education not only limits the welfare of large sections of society but also denies them opportunity to share the benefits of growth. A healthy education culture accelerates quality of human resource development. Education is the most critical element in empowering manpower and providing access to productive employment. The urban rural divide in terms of access, equity and resources will have to be addressed. The new education system learners who can afford high cost of modern education will get the best. The economically weak but academically highly competent learners will benefit from the public/private social support system. However the academically and financially poor learners will acquire compromised quality learning. The illiterate and poor will be left to the mercy of the traditional public education systems using heavy amounts of public money yet remain to be highly ineffective. In a highly widened gap between the haves and have nots with a hugely dispersed population and a severe resource crunch ICT application in education becomes an absolute necessity. Education is the driving force of economic and social development in any country (Cholin, 2005, Mehta and Kaha, 2006) India has one of the largest higher education systems in the world consisting of over 651 universities according to UGC as on 2013. According to Higher Education in the 12th Five-Year Plan Report (2012-17) as on August 2011 there were 31,324 colleges of higher learning in the country. 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) (UGC 12th plan) Inclusive education means that the school can provide a good respect and ensured equal opportunities to learn together. Inclusive education is an on-going process. Teachers must work actively and deliberately to reach its goals. (UNESCO 2007) (Vincenza B Stefania B, retrieved 2014) Educational research provides strong evidence that: "ICT is both a medium and a powerful tool in supporting inclusive practice. It provides wide-ranging support for communication, assisting many learners to engage with learning, including those who are hard to reach, and helps to break down some of the barriers that lead to under-achievement and educational exclusion" (Becta,2004,2007) 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. A country with growth intention should develop her citizens because several empirical studies have shown that educated and skilled population usually create, share, and use the knowledge to facilitate the effective creation, dissemination of wealth (Anderson, 2009; Selwood et al 2003 and Unwin, 2009 E Ukpe 2013) Song et al (2009) note that countries with pervasive information infrastructures that used ICT application possessed advantages of sustained economic growth and social development. Investing in ICT is quite a challenge for the poor nations moreover its success also depends upon clear plans and firm commitment on the part of policymakers. Several research outcomes have revealed that quality education can reduce poverty. ICT based education has the potential to provide skill and application based learning which in turn helps to relate learning to entrepreneurship, creating self employment and economically viable career solutions. Improved education is essential to the creation of effective human capital in any country (Evoh, 2007). The education system should continue to undergo reforms to be competitive with other developed nations and depart from the system set up by colonial rulers (World Bank report 2008) ICT is a powerful tool for education in any country (Unwin, 2009) ICT based education if appropriately implemented, it would catalyze and accelerate education reform and economic development (Emmanuel UKpe 2013) It is well-established that education is an important catalyst for achieving all development goals. It has been recognized that, within the Millenium Development Goals framework, there is "an interconnectedness of all development goals with key inter-linkages between education, health, poverty reduction, and gender equality, where improvement in one area has a positive effect on the others"(UNESCO 2011) Indeed, in the same way that education has positive effects on health, poverty reduction and elimination of hunger, as well as on gender equality, each, in turn, has a positive effect on education. Higher levels of more relevant learning outcomes are thus both a condition for, as well as a result of, progress in other social sectors.

II. SIGNIFICANCE

Globalisation has profoundly influenced higher education. Globalization has increasingly integrated world economy, introduced new information and communications technology (ICT) and erected an international knowledge network. Higher education has always been affected by international trends Yet, 21st century realities have magnified the importance of the global context The ICT enabled learning effects the requirements of 21st century which focuses on learner centric environment, collaborative learning and knowledge sharing. Introduction of ICT in education has truly revolutionised how knowledge is communicated. In India the presence of ICT in education has expanded exponentially and has touched several dimensions of higher education. India's demographic data reflects a increasing demand of education for 75 percent rural and 50% below 15 years of age population. The demand for education far outstrips the ability of the conventional system to adequately provide for knowledge development. ICTs 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 (Mc Gorry, 2002) Indian education scenario is marred with high drop outs in schools. Major reasons for dropouts are: Long distance and irregular functioning schools, Non availability or incompetent teachers and the need for children to work for financial support to family. ICT enabled education can resolve these problems to a great extent as it transcends distance and time inflexibilities. Moreover content developed by quality teachers can be

uniformly taught through ICT. According to (Gwang-Jo Kim 2009) ICT in education is a comprehensive approach to innovate education systems, methods and management and can serve the following purposes:

a) Resturcturing education system b) Diversifying teaching learning methods and practices c) Engaging all stakeholders of education and adapt rapidly to changes in society and the environment, and d) Enhancing education efficiency, effectiveness and productivity ICT can enhance educational oppurtunities and outcomes for students including those with learning disabilities (Anderson, 2009) In the last three decades it has been proved that our technological processes are comparable to the best yet there is great scope for betterment. The challenge for developing countries is to compete effectively in an emerging information based economy. It is argued by the decision makers that it is better to invest in education in countries with big population living in extreme poverty than to spend on providing for better living conditions. Considering the human capital theory the best way to reach a sustained solution to reduce the economic problems of a country is to improve the educational level to promote economic growth. According to the Knowledge Readiness Survey for India by Hewitt Associates on the World Bank Knowledge Economy Index India is ranked lowly 100. It is time we stop looking at people development as a social obligation and consider it as an Economic Necessity (FICCI report 2009)

III. AREAS OF CONCERN

Rural population and its problems in India is a complex phenomenon. There cannot be one approach for its alleviation. ICT can be a key driver in effective resource allocation however there are some important questions to be answered like - how do we tackle: Resistance to change by parties with vested interest in the old order Devising and implementing different models for different states as the specifics of each state and region are unique Public Private Partnership to enhance effectiveness and sustainability quotient of the project Effective people participation: The user and the general society must become active participants towards the effective implementation and success of the project. And important aspect which has been detrimental to the success and sustenance of ICTE projects has been the lack of Cost Benefit analysis of the project and most importantly no thought given to the Return on Investment of the project. There are several factors that impact sustainability impact of ICT projects: 3.1 Individual Drive. Most of the ICT projects have been a brainchild of an individual. Once they leave the project not steps are take to ensure sustainability of the project.

3.2 Resistance to Change vested interests never allow old orders go change as the change makes them powerless

3.3 Revenue Model. Most of the projects are either built on Government subsidy or donor money. A lack of revenue model brings only short term success to the project. At the planning stage itself the project should outline steps for independent financial sustainability after initial years.

3.4 Futuristic planning. The projects focus on one time effort and do not include capacity building plans

3.5 Content Participation of learner in the process is possible only if the content is learner language and learning capacity compatible. Moreover quality of the content is the deciding factor in the success of the project.

3.6 Monitoring and accountability of the projects In most,cases pilot projects fail to deliver expected results due to no proper monitoring and evaluation procedures included in the plan. It is important to clearly outline the goals or success factors of the project and should be evaluated from time to time. The policymakers often overlook the aspect of monitoring and evaluating the projects. It is critical to ensure that the projects are achieving the intended impact and will be sustainable in the long run. Stakeholders must be part of the project to ensure transparency and avoid corrupt practices. In Africa personal digital assistants are used as a tool to monitor and evaluate projects.

3.7 Optimal functioning in a resource crunched country it is essential to implement ways which will enable optimum utilisation of available infrastructure than creating new infrastructure. Instead of only depending on computers and satellite for content delivery the strong mass medium base of Radio and Television can be combined to give best results

3.8 Usability and Scalability the applications should keep in mind the need and potential of the user. Moreover it is essential that the projects have scalable scope keeping the changing times and requirements in scope. Majority of the new e learning software are evolving around voice, motion, image and special effects aspects. Majority of the students benefit from these software but learners with special needs may find this as a barrier.

VI. SUSTAINED DEVELOPMENTS THROUGH TECHNOLOGY

Economic theory describes three factors that lead to increased productivity Capital Deepening, Higher Quality Labour and Technological Innovation. Technological innovation means using technology to develop new products and services to create new knowledge. This knowledge can be used multiple times, by many people simultaneously and can be shared widely. Knowledge is a productivity factor with compounding returns. Hence investments in knowledge creation lead to continuous growth. The creation and wide sharing of new knowledge in the economy will lead to creation of a knowledge driven virtuous cycle of sustainable growth. The three complimentary, somewhat overlapping approaches to education reform that can contribute to economic and social development are Knowledge acquisition; knowledge deepening; knowledge creation approach. (Robert kozma 2008) Singapore is an example that began its education reform with the knowledge acquisition approach. Its education system focused on producing higher levels of skills in science mathematics and language which set the stage for economic development Classroom activities and projects that engage students in the solution of extended open ended real world problems are an important component of knowledge deepening approach. A shift from memorization of isolated facts to understanding deep relationships among concepts and their application is the knowledge creation approach. Indian engineers often have trouble applying skills in real-world contexts. The Wall Street Journal explains: “Trained by rote learning in an often inflexible higher education system, they [India’s technical graduates] are a far cry from the confident self-starters that many multinationals require—who can be entrusted with making decisions without requiring constant supervision.” A study by Duke University distinguished between “transactional” engineers who are grounded in fundamental skills and “dynamic” engineers, who can apply their skills creatively in varied circumstances and work in teams to solve novel problems. Much of Indian education needs to focus on developing more dynamic engineers. If students are to participate in a society where knowledge creation sharing and use are to be the basis

of sustained growth, then the ICT integrated education must develop critical thinking skills and support continuous reflective learning. This kind of shift in education approach is particularly challenging for developing countries. This change requires a multi sector approach involving government business and society. Strategic reforms in education sector particularly supported by the technology industry can launch economic growth and sustainable development. These investments can help develop new markets and reduce inequities.'

V. EXISTING ICT ENABLED EDUCATION INITIATIVES

India has taken up major initiatives in terms of Indian Initiatives furthering education through Information and Communication Technology. Some of the Government Initiatives are: Gyan Darshan was launched in 2000 to broadcast educational programs for school, uiversity students, and adults. Gyan Vani is another 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. In 2004 ISRO launched EDUSAT, the world'sfirst dedicated educational satellite at that time. It is Dedicated towards providing virtual classroom education to children in remote villages who have no access to quality education. E-Gyankosh launched by IGNOU in 2005 is a knowledge repository aimed at preserving digital learning resources. The National Programme for Technology Enhanced Learning (NPTEL) launched in 2001 is another joint initiative of IITs and IISc which promotes education through technology. In 2009 the National Mission on Education through ICT was launched by the government to harness ICT's potential throughout India. 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. Countrywide classroom initiated by UGC consortium for education and 17 universities where media centers are located. Jhabua development communication program is a space application center is a government of Madhya Pradesh initiative. There has been a considerable contribution to the cause through the Public Private Partnership. The government of Andhra Pradesh in partnership with Tata group is providing literacy to the poorest districts of India. Baatchit, Infothela are some intitatives with Medialab Asia working on the outskirts of Delhi and remote interiors of Tamil Nadu providing access and content to the rural population. Project Vidya in association with Intel seeks to improve quality of education in selected government schools through ICT. The Hole in the Wall by NIIT is one of the most successful project providing ICT based education in the urban slums. The Karnataka CLC in schools project supported by Azim Premji foundation works towards increasing retention of children in schools and improving motivation levels towards learning. Despite all these good initiatives several regions have failed to reap the benefits of improved inclusive education status through ICT enabled learning.

VI. CHALLENGES

Inspite of the rapidly growing and innovative developments contributing to ICT enabled education initiative the developing countries face several challenges in the process of effective implementation of the project. Limited resources and weak infrastructure is one of the major issues. Lack of effective implementation of policies and poor coordination between the multiple supporting agencies adds to the chaos. Poorly trained disinterested

teachers and inadequate monitoring and evaluation of the projects results in best of plans and ideas not reaching the expected results. Low level of electrification, poor internet connectivity, non-availability of computers and software compatibility makes the effort a complete drain. Several good policies are formulated with a great sense of commitment. However these plans and commitments fail at the implementation stage The Indian Government addresses the challenge of inclusive education and growth through centralized decision making process. In a country with such linguistic and cultural diversities centralized planning will not give desired results. It is pertinent that the projects be initiated keeping the local needs and culture in mind. The Gyandoot and Jhabua project successes are an evidence of the same.

VII. SUGGESTIONS

If ICTs are to be organically integrated in the teaching learning process the teachers and administrators should be trained and their attitudes and apprehensions need to be addressed. Coordination between the education, communication and finance ministry to ensure coherence at the policy level, must be dealt with on a priority basis. Turning the potential of ICTE into reality with results is a tremendous challenge. ICTE must be locally driven and case specific else the initiative will lead to further isolation of the impoverished population Strong sustainable partnerships between the government, private sector and civil society must be built to offset costs and mitigate the complexities of the integration of ICT in education systems (Patti Swarts) (GAID 2009) In the long run the active participation of the government is essential to ensure the sector wide introduction of ICTE. Government involvement is critical to source additional investments in the ICT infrastructure, to integrate ICT in curriculum and to facilitate the widespread diffusion of materials. (GAID 2009) Sustainable partnerships between the government, private sector and civil society will enable optimal use of finances and infrastructure and reduces complexities and obstacles. The high level of investments in the projects necessitates strategic and careful planning, finding creative ways of financing and creating networks and synergies. The funding and development of infrastructure issue can be addressed through effective promotion of projects to private partners. There is an urgent need to develop project monitoring and evaluation tools which will precisely measure and indicate the progress of the model and the weak areas that need to be relooked in terms of policy or implementation aspects. Writing policy is an easy task implementing it effectively is what is difficult and costly. Policy needs to be developed in tandem at multiple levels. Policies regarding access to infrastructure, connectivity, content development, training etc. need to be developed and implemented concurrently for initiatives ti be successful. Furthermore, it is not sufficient for policies to exist only at the national level. They need to be articulated with those at state province and school levels to ensure that ICT adoption is encouraged and supported (Usha V, Vineeta S 2003)

VIII. CONCLUSION

The relationship between ICT supported education system and economic development of a developing courny has been documented by several studies (Anderson, 2009; Selwood et al, 2003; and Unwin 2009) ICT can definitely and significantly impact the education and economic landscape of a country. Responding to mass demand for education by citizens of one of the worlds largest populated country remains to be a tough call. Massification of education for developing countries is a big challenge due to the enormous cost involved. Tough initial investment required for ICT enabled education is high but in the long run due to the benefits of

extensive reach, cost cuts in travel, reduction in time lost, suitable content development and effective delivery, it proves to be the most suitable solution to inclusive sustained development. The right to education is to be seen as an enabling right for the realization of other economic , social and cultural rights , as well as a catalyst for positive societal change (Drèze and Sen 1995) (UNESCO 2012) ICTs are currently being used widely to aid education in many developing countries and it appears that there is increasing demand for their use in education by policy makers and parents in developing countries (Wagner et al 2005) It is obvious that if a country has to have technically skilled workforce, who are trained to apply learning for sustenance and growth purposes they must be taught use of ICT and through ICT. It is necessary to understand that a comprehensive and holistic outlook towards planning development and implementation of initiatives will only result in ICT enabled education contributing to inclusive growth and sustained development. Those countries which have delivered evident economic developmental results through implementation of ICT enabled education (Australia, Korea, Japan) have had comprehensive policy frameworks, well integrated implementation mechanisms, measurement tools and committed resources to ensure to ensure trouble free implementation and desired results. The role of higher education as a public good continues to be fundamentally important and must be supported through ICT to deliver inclusive growth. It is pertinent to understand the broader role of ICT integrated higher education in the globalised world and develop constructive plans to deal with the challenges so as to accelerate inclusive growth and ensure sustained development.

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