TRENDS AND CHALLENGES OF INTEGRATING ICT IN INDIAN EDUCATION: A PARADIGM SHIFT IN 21st CENTURY

By

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ABSTRACT

Information and communication technologies are today playing a very important role in transforming the mode of imparting education. The trend in educational system has seen a leaning towards upgrading and updating knowledge and ideas to face increasingly demanding in order to meet the rapid expansion of knowledge. Technology enabled teaching have helped in taking forward the level of education by preparing teacher community in improving their professional competencies and skills in order to meet the competitive classrooms. The increase in the number of job opportunities in the current global economy has witnessed an enhanced demand for skilled and qualified teacher community. The synchronous learning environment proves to be advantageous to the workforce, as it brings to them a quality and standard of education that would otherwise not be available to them at all. ICT brought considerable change in capacity and globality for accessing and using information as well as communicating both of which have impacted on education. The digital era brought revolutionary changes in teaching and learning process by bringing multimedia approach in which multifaceted instructional pedagogies have been incorporated in order to simplify classroom instruction to the fullest extent. There are lots of ICT applications designed for children in the classroom teaching and a lot of imagination has gone into these designs especially educational applications and it is evidenced that technologies have changed the way of teaching and learning is conducted in different parts of the world by developing some effective and interesting education tools. It is evidenced that integration of ICT in Education and changing role of imparting instruction has fully influenced modern classroom practices and it is right time to address the present ICT application in the 21st Century that is the paradigm shift in Indian class room. This paper addresses the modern Trend and Challenges in Integrating the ICT in Indian education system.

Keywords: Digital literacy, Synchronous learning, Multimedia Approach.

INTRODUCTION

The world in which we live is rapidly changing and the field of education is experiencing these changes in the global scale. The olden days of educational institution having an isolated audio-visual department are long gone! The growth in use of ICT within the education sector has accelerated in recent years and looks set for continued expansion in the future. Teachers primarily require access to learning resources, which can support concept development by learners in a variety of ways to meet individual learning needs. The development of multimedia technologies for learning offers new ways in which learning can take place in schools and the home. Enabling teachers to have access to multimedia learning resources, which support constructive concept development, allows the teacher to focus more on being a facilitator of learning while working with individual students. Extending the use of multimedia learning resources to the home represents an educational opportunity with the potential to improve student learning. A good teacher seeks as many ways as possible to present information and ideas to students to stimulate their thinking. India actively promotes the use of information and communication technologies (ICTs) in education in the formal education sector today, as it has in the non-formal sector for more than 40 years. From the use of radio to spearhead the green revolution, to satellite-based, one-way and interactive television for rural development in some of the most backward districts,1 to today's thrust for the use of open and distance learning models to serve the larger populations, India has tried it all,

with varying degrees of success. In fact, since the early 1950s, Indian policy documents have identified the need to use all media for promoting development and, implicitly, for education. The subsequent policy and plan documents on education, prepared from time to time, have chalked out a role for technology applications, especially in the non-formal education sector those who are said to be geographically and emotionally separated.

UNESCOplanning guide(2010) for ICT in teacher-education cites three key principles for effective ICT development in Teacher Education that were put forward by the Society for Information Technology.

- Technology should be infused into the entire educational programme, implying that ICT should not be restricted to a single course but needs to permeate in all courses.
- Technology should be introduced in context. Accordingly, ICT application like word-processing, databases, spread-sheet and telecommunications should not be taught as separate topics rather encountered as the need arises in all courses of Teacher-Education programmes.
- Students should experience innovative technology supported learning environment. This requires that students should see their lecturers engaging in technology to present their subjects utilizing power point or simulations in lectures and demonstrations. Students should also have the opportunity to use such applications in practical classes, seminars and assignments.

The application of these three principles will be a mile stone towards effectively integrating ICT in Teacher-Education.

Trends of ICT in Education

Globalization and technological advancement that have accelerated the world over the past fifteen years have created a new global economy powered by information, fueled by communication and driven by technological knowledge. The emergence of this new global economy has serious implications over the nature and purpose of education and educational institution. As the life of information continues to shrink, the access to information continues to grow exponentially; schools cannot remain mere venues for the transmission of prescribed set of information from the teacher to student over a fixed period of time. Schools must promote learning to learn, i.e. it should make the learner to learn continuously to acquire knowledge and skills throughout the lifetime. The illiterate of the 21st Century, according to futurist Alvin Toffler, "will not be those who cannot read and write, but those who cannot learn and communicate using globalised modern techniques. Concerns over educational relevance and quality coexist with the imperative of expanding educational opportunities. Particularly in developing countries like India, to those who are made most vulnerable by globalization, i.e. Low income groups, girls, women and low skilled workers in particular. Global changes also put pressure on all groups to constantly acquire and apply new skill.

Information and Communication technologies includes Radio, Television as well as newer digital technologies such as Computers, Mobile phones and the Internet have really touted as potentially powerful enabling tools for educational change and reform When used appropriately, differently ICT'S are said to help expanding access to education, strengthen the relevance of education and raise educational quality by making, teaching and learning into an engaging, active process connected to real life (Kumar.K.L-2005) However, the experience if introducing different ICT's in the classroom and other educational settings, all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICT s into educational system is complex, multifaceted process that involves not just technology indeed, but also curriculum and pedagogy, institutional readiness, teacher competencies and long term financing among others. Policy makers in developing counties should keep in mind to define a framework for the appropriate and effective use of ICTs in their educational system by providing a brief overview of the potential benefits of ICT use in education and the way by which different ICTs have been used in education so far. Secondly it addresses the four broad issues in the use of ICTs in education such as effectiveness, cost, equity and sustainability (Ahmed,S. &

Singh,M, 2010). The primer concludes the five challenges that policy makers in developing countries must reckon with when making decision about the integration of ICTs in Education, namely educational policy and planning, infrastructure, capacity building, language and content and financing.

India today aspires to emerge as front-runner amongst the knowledge-based societies. Thus, the benefits of Information and Communication Technology revolution in providing education and training of desirable quality can hardly be over emphasized. The challenge ahead is to provide universal access, equity and quality at all levels of education system. It is a critical stage in the educational hierarchy as it prepares the students' career path in higher education as also in the world of work. As educational indicators are not very encouraging at the moment, the responsibility is now to ensure substantial investment to improve the current scenario at the earliest. Use of technology by students at the Secondary stage pre-supposes their strength in terms of knowledge and skill development. As Internet becomes more and more accessible, the world of information and innovations has become more accessible today. Recognizing the importance of ICT in education as early as 1984-85, Computer Literacy and Studies in Schools (CLASS) Project was launched. Today, exclusive educational television channel 'Gyan Darshan' has been launched to provide satellite based education across the country besides the interactive radio programme. In December 2004, the ICT in Schools Scheme was launched to open a window of opportunity for secondary stage school students across the country in partnership with states/union territories. While the emphasis has been on the computer literacy programme, the advantage is now realized in use of IT tools for development of e-content in the computer aided learning activities and self learning by students. The Government of India recognizes the need to develop an appropriate National ICT in education policy to integrate ICTs in education and is aware of the role played by various organizations in helping the nation move towards a dynamic and progressive policy. To develop an appropriate and deliberate policy to enhance the role of ICT in education and poverty eradication, the Department of School Education, MHRD, Govt. of India has decided to initiate a consultative and participatory process to formulate the National Policy on ICT in School Education. The integration of ICT based instruction and Computer based Instruction can stimulate the rate of learning and encourage the students community to learn joyfully on their own way. Teaching community will have to be sensitized themselves that the trend in teaching-learning process is the compulsory we need to update and abbess in tune with current trend in the field of education.

Challenges of ICT in Education

The vision for technology-supported reform-oriented classrooms is one in which student groups work on long-term, multidisciplinary projects involving challenging content is interesting and important to them with the support of technology tools for collecting, analyzing, displaying, and communicating information. Making this vision a reality poses many challenges. Below are four major challenges:

- Providing Adequate Technology Access
- Equalizing Technology Access
- Involving a Majority of Teachers
- Providing Technical Support for Technology Use and Maintenance

Providing Adequate Technology Access

Technology cannot become a meaningful support for students' work if they have access to it for only a few minutes a week. The kind of technology-supported project-based instruction requires a high level of access to the sorts of technology tools that researchers and other professionals use on a daily basis to support their classroom instructions. Data from national surveys suggest that although American schools have more microcomputers than those of any other country, the level of access is still insufficient to fulfill this vision. American students report using computers an average of 40 minutes a week (Becker 1994).

Equalizing Technology Access

Corollary to the challenge of providing adequate access to technology is the concern with making sure that different kinds of students get equal access. Data from national surveys suggest that students from low-income homes and

ethnic minorities are less likely to have computers in their homes (Becker & Sterling, 1987). Although the differences are smaller than those for ethnicity and socioeconomic status, there is also a gender difference in technology access to computers, with boys having more home access than girls (Sutton, 1991). Even when students from low-income homes or girls are in classrooms with technology, there are many anecdotal reports of their having less time with the technology than do boys from more affluent homes (Sutton 1991).

Involving a Majority of Teachers

Placing technology in classrooms does not insure that it will get used appropriately or even that it will get used at all. Most of us have visited classrooms with one or two computers in the back covered with a plastic cover that is rarely removed. The reformer's vision of a project-centered classroom with students using technology tools makes extensive demands on teachers. (e.g. project-based classrooms) Teachers are expected to orchestrate a classroom in which students pursue different questions, work at different speeds, use different materials, and work in flexible groups. Students will be working with original data sources, often pushing beyond the limits of the teacher's knowledge, and learning to work together to produce products that demonstrate what they have learned. All of this must be carefully planned and supported by a teacher in such a way that the students take ownership of their projects and feel responsible for their own learning, while at the same time ensuring that the essential content in local, state, or national curriculum standards in multiple areas are met and that students will perform.

Providing Technical Support for Technology Use and Maintenance

Even after teachers' initial fear of getting involved with technology has been overcome, serious challenges remain in terms of providing enough technical support that teachers will not be discouraged by equipment failures or software behavior they do not understand. Quite a bit of technical support is needed in schools where all or most teachers are using technology, particularly if new or experimental systems are involved or extensive use is made of computer networks. At least five kinds of technical assistance are necessary and care should be taken in providing technical support in

- Helping in planning for technology uses and acquisitions
- Providing training in how to use new hardware and software
- Providing demonstrations and advice on how to incorporate technology into instruction
- Providing on-demand help when software problems or hardware failures arise
- Performing low-level maintenance on the system

The role of technology in education have proved to help in clarifying concepts, stimulating group and individual activities, developing a collective awareness, changing attitudes imposing a new structure or organization on certain subjects and encouraging originality and creativeness. Henri Dieuzeide(1970) stated that' The use of these techniques has been even sometime made it possible to progress beyond a mere change in the educational climate. Educational Technology has to be taken up as a comprehensive and continuous programme, of course, to be used as a remedy for inherent deficiencies in the system and to promote a certain amount of flexibility into the functioning of the school system which has been in a rut for decades. Although valuable lessons may be learned from best practices around the world, there is no one formula for determining the optimal level of ICT integration in the educational system(Gunn.2003) Significant challenges that policymakers and planners, educators, education administrators, and other stakeholders need to consider include educational policy and planning, infrastructure, language and content, capacity building and financing. Attempts to enhance and reform education through ICTs require clear and specific objectives, guidelines and time-bound targets, the mobilization of required resources, and the political commitment at all levels to see the initiative through. Some essential elements of planning for ICT are listed below.

- A rigorous analysis of the present state of the educational system. ICT-based interventions must take into

account current institutional practices and arrangements. Specifically, drivers and barriers to ICT use need to be identified, including those related to curriculum and pedagogy, infrastructure, capacity-building, language and content, and financing.

- The specification of educational goals at different education and training levels as well as the different modalities of use of ICTs that can best be employed in pursuit of these goals. This requires of the policymaker an understanding of the potentials of different ICTs when applied in different contexts for different purposes, and an awareness of priority education needs and financial and human resource capacity and constraints within the country or locality, as well as best practices around the world and how these practices can be adapted for specific country requirements.
- The identification of stakeholders and the harmonizing of efforts across different interest groups.
- The piloting of the chosen ICT-based model. Even the best designed models or those that have already been proven to work in other contexts need to be tested on a small scale. Such pilots are essential to identify, and correct, potential glitches in instructional design, implement ability, effectiveness and
- The specification of existing sources of financing and the development of strategies for generating financial resources to support ICT use over the long term.

Challenges with respect to capacity-building

Men and material resources must be developed throughout the educational system for integration ICT in teaching-learning process.

- Teachers: Teacher professional development should have four foci
- Skills with particular applications
- Integration into existing curriculum
- Curricular changes related to the use of IT (including changes in instructional design)
- Change in teacher role (Passion, Competencies, open mindedness, motivation and zeal)

ICT are swiftly evolving technologies, however, the most ICT fluent teachers need to continuously upgrade their skills and keep abreast of the latest developments and best practices. Research on the use of ICTs in different educational settings over the years invariably identify as a barrier to success the inability of teachers to understand why they should use ICTs and how exactly they can use ICTs to help them teach better. Unfortunately, most teacher professional development in ICTs is heavy on "teaching the tools" and light on "using the tools to teach." Teacher anxiety over being replaced by technology or losing their authority in the classroom as the learning process becomes more learner-centered an acknowledged barrier to ICT adoption can be alleviated only if teachers have a keen understanding and appreciation of their changing role(Vanaja&Lalini Varanasi,2006).

Education administrators

Leadership plays a key role in ICT integration in education. Many teacher or student-initiated ICT projects have been undermined by lack of support from ICT integration programmes to be effective and sustainable. Administrators themselves must be competent in the use of the technology and they must have a broad understanding of the technical, curricular, administrative, financial and social dimensions of ICT use in educational system.

Technical support specialists

Whether provided by in-school staff or external service providers or both, technical support specialists are essential to the continued viability of ICT use in a given school. While the technical support requirements of an institution depend ultimately on what and how technology is deployed and used, general competencies that are required would be in the installation, operation and maintenance of technical equipment (including software), network administration and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns.

Content developers

Content development is a critical area that is too often overlooked. There is a need to develop original educational content (Radio programmes, interactive multimedia learning materials on CD-ROM or DVD, Web-

based courses, etc.), adapt existing content and convert print-based content to digital media. These are tasks for which content development specialists such as instructional designers, scriptwriters, audio and video production specialists, programmers, multimedia course authors and web-developers are needed. Many universities with distance education programs, and those who otherwise make use of ICTs, have dedicated technical support and content development units.

Challenges related to financing the cost of ICT use

One of the greatest challenges in ICT use in education is balancing educational goals with economic realities. ICTs in education programs require large capital investments and developing countries need to be prudent in making decisions about what models of ICT use will be introduced and to be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added of ICT use offsets the cost, relative to the cost of alternatives. Put another way, is ICT-based learning the most effective strategy for achieving the desired educational goals, and if so what is the modality and scale of implementation that can be supported given existing financial, human and other resources.

Educational Implications

- Teacher Community is expected to restructure his environment for promoting effective learning and utilizing educational technology in an integrated manner.
- Technology also attempts to incorporate the management principles of resource development, system analysis and cost effectiveness in turn it is regarded as the hand mind of teaching profession.
- The extended version on of technology is Multimedia communication in the form of multi channel learning system is the product of various types of instructional materials, design and information, communication in education.
- Improving the quality of education in adopting new trends by updating day to day knowledge prepare them on the lines new initiatives to taken in the teaching learning process.

Conclusion

National Policy on ICT in School Education in (NPICT2008) India has rightly pointed out that the progress of our nation depends on the system of education that exists in our country. The aim of education is to mould the future of our nation by moulding young Indians with a balanced and well-rounded education. Over the past few years globalization, rapid technological developments and information explosion is compelling changes in the purpose and nature of education. Education in India is characterized by issues related to access, equity and quality. If India today aspires to emerge as a front-runner among the knowledge based societies, the usage of ICT in providing education of desirable quality can hardly be over emphasized. While many states have their own ICT policy, it has been felt that a coherent and enabling policy for ICT at the national level would have tremendous benefits for the synergetic growth of our country. The National Policy would need to consist of objectives, guidelines, practices and must clearly articulate the role of ICT in school education. The most appropriate process would be a consultative one with all the stakeholders and educationists, ICT specialists, policymakers, community etc. While creating this policy, we need to keep in mind the context of the emerging globalised economy and position it at the frontier of this transition. Today's education faces irrelevance unless we bridge the gap between how students live and how they learn. Students will spend their lives in a multitasking, multifaceted, technology-driven vibrant world and they must be equipped to handle the challenges of the 21st century effectively. It is obvious that the old pedagogical framework of de-contextualized instructional practices and fixed curriculum is clearly inappropriate. With information having increasingly short shelf life, education must empower learners to learn for themselves and to continue to do so incessantly. It is important to understand the key learning skills of the future. Interpersonal Skills, Information skills, technological skills, basic skills thinking skills and learning ability. It is evident that the integration of ICT in all stages of education should be the core component to make instruction easier and concrete and a very big c

Today's India aspires to emerge as front-runner among the

knowledge-based societies. Thus, the benefits of ICT revolution in providing education and training of desirable quality can hardly be over emphasized -- National Policy for ICT in Indian Education.

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