



## **ICT in Education: Enhancing Teaching and Learning**

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### ***Abstract***

*In the developed countries and the urban elites of advanced economies, twenty-first century education integrates technologies, engaging students in ways which were not previously possible, creating new learning and teaching possibilities, enhancing achievement and extending interactions with local and global communities. Students live in a world that has seen an information explosion and significant and rapid social and economic changes. Student learning is the focus of teaching learning process. Theorists and practitioners have always been made concerted efforts to facilitate students learning by enhancing the quality of learning experiences. Emergence of learning theories over time reflects the concern of educators to explore process, factors and conditions involved in human learning. Application of predominant learning theories have always been changing and modifying the methods of teaching and learning. Research conducted on young people shows a remarkable trend. It indicates that children retain 20% of what they hear, 40% of what they see and hear and 75% of what they see and do. That's one of the key reasons why the latest educational technology has become essential to impart education. They combine the use of several ICTs- internet, video, audio, graphics, text, images, etc. to offer students a near live experience of what is learning. In this paper efforts have been made to analyze the present situations in order to identify the constraints and possibilities in the use of ICT in teaching profession.*

## **Introduction:**

Globalization and technological change – processes that have accelerated in tandem over the past fifteen years – have created a new global economy “powered by technology, fuelled by information and driven by knowledge”. The emergence of this new global economy has serious implications for the nature and purpose of educational institutions. As the access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote the acquisition of knowledge and skills that make possible continuous learning over lifetime. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, active process connected to real life. However, the experience of introducing different ICTs 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 ICT is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology – indeed, given enough initial capital getting the technology is the easiest part – but also curriculum and pedagogy, institutional readiness, teacher competencies, and long term financing, among others.

Despite the continued efforts of the various Governments on universalizing the primary and elementary education, through a wide range of programmes and schemes, access to quality education continues to be an obstacle in the achievement of the education goals. Efforts so far have addressed to a considerable degree, the concerns of equity as well as that of regional parity, however concerns of quality have not received adequate attention. Recognizing this, the Government of India’s flagship education programme at the primary level - the Sarva Shiksha Abhiyan (SSA) - has streamlined its focus on ‘quality’. As is being increasingly articulated, if after spending large sums of money on programmes and schemes, we have not become fully literate, it is time that innovative and cost effective methods be put in place to address the problem of education in our country. While this is a larger problem and points to the need for reform in the educational systems at various levels - pedagogical, curricular, as well as institutional, the emergence of various Information and Communication

Technologies (ICTs) and their increasing acceptance and adoption by society provide unique opportunities and could potentially promote education on a large scale.

*In* diverse socio-economic and cultural contexts, ICTs can be successfully employed to reach out to a greater number of students, including those to whom education was previously not easily accessible, and help in promoting learning, along with exposing students to the technical skills required for many occupations. ICTs act as and provide students and teachers with new tools that enable improved learning and teaching. Geographical distance no longer becomes an insurmountable obstacle to obtaining an education. It is no longer necessary for teachers and students to be physically in proximity, due to innovations of technologies such as teleconferencing and distance learning, which allow for synchronous learning.

ICTs in schools provide an opportunity to teachers to transform their practices by providing them with improved educational content and more effective teaching and learning methods. ICTs improve the learning process through the provision of more interactive educational materials that increase learner motivation and facilitate the easy acquisition of basic skills. The use of various multimedia devices such as television, videos, and computer applications offers more challenging and engaging learning environment for students of all ages.

Twenty-first century teaching learning skills underscore the need to shift from the traditional teacher-centered pedagogy to more learner-centered methods. Active and collaborative learning environments facilitated by ICT contribute to the creation of a knowledge-based student population. Education leadership, management, and governance can also be improved through ICT by enhancing educational content development and supporting administrative processes in schools and other educational establishments.

ICT can be used as a potential tool in the process of education in the following ways:

- **Informative tool:** It provides vast amount of data in various formats such as audio, video, documents.
- **Situating tool:** It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
- **Constructive tool:** To manipulate the data and generate analysis.



- **Communicative tool:** It can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004).

### **ICT in School Education**

In the developing world, ICTs are used largely to increase access to and improve the relevance and quality of education. ICTs have demonstrated potential to increase the options, access, participation, and achievement for all students. The unprecedented speed and general availability of diverse and relevant information due to ICT, extends educational opportunities to the marginalized and vulnerable groups, among the other disadvantaged.

ICTs in the developing world have the potential to enhance the education experience for children who:

- live in rural and remote-rural locations
- have special learning needs
- have physical disabilities constraining their access to schools
- have dropped out and/or have kept themselves out of school for various reasons.
- aim for excellence and fail to get satisfied in the current system.

Teachers and learners in the developing world are no longer solely dependent on physical media such as printed textbooks which are often times outdated. With today's technology, one even has the ability to access experts, professionals, and leaders in their fields of interest, around the world at any given time. In India, various ICTs have been employed over the years to promote primary and secondary education. These include radio, satellite based, one-way and interactive television, and the Internet. However, there have been enormous geographic and demographic disparities in their use. Some states in the country currently have an enabling environment in place that allows for a greater use of ICTs for education, whereas other states lack such an environment making the use of ICTs for this purpose very sporadic.

ICTs in school education are most likely to successfully contribute to the following areas:

*ICTs promote learning anytime, anywhere.* One defining feature of ICTs is their ability to transcend time and space. 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. ICT-based educational delivery (e.g., educational programming broadcast over radio or television)

also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).

*ICTs help in accessing remote learning resources.* 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. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons – experts, researchers, professionals, business leaders, and peers – all over the world.



*ICTs prepare individuals for the workplace.* ICTs enhance the students learning and make them adjust in their job places. One of the most commonly cited reasons for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the Internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing job market. Technological literacy, however, is not the only skill well paying job in the new global economy will require? EnGauge of the North Central Regional Educational Laboratory (U.S.) has identified what it calls “21st Century Skills,” which includes digital age literacy (consisting of functional literacy, visual literacy, scientific literacy, technological literacy, information literacy, cultural literacy, and global awareness), inventive thinking, higher-order thinking and sound reasoning, effective communication, and high productivity.

*ICTs improve the quality of education.* Improving the quality of education and training is a critical issue, particularly at a time of educational expansion. ICTs can enhance the quality of education in several ways; by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs such as videos, television and multimedia computer software that combine text, sound, and colourful, moving

images can be used to provide challenging and authentic content that will engage the student in the learning process and also provide the opportunity to connect with real people and to participate in real world events. The transmission of basic skills and concepts that are the foundation of higher order thinking skills and creativity can be facilitated by ICTs through drill and practice. ICTs have also been used to improve the quality of teacher training. It offers self-directed, self-paced Web-based courses for primary and secondary school teachers

*ICTs transform learning environment into learner centered.*

Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century]. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning. When used appropriately, ICTs – especially computers and Internet technologies – enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from teacher centered pedagogy – in its worst form characterized by memorization and rote learning – to one that is learner centered.

Changes to pedagogical practices in classrooms require that teachers should have access to infrastructure Policy-makers, administrators, and teachers are using a variety of tools and strategies to improve access to learning opportunities, improve the teaching and learning experience for teachers and students, and make effective use of limited resources.

*A. Basic Computer/Technology Operations and Concepts:* Teachers should use computer systems to access, generate and manipulate data; and to publish results. They should also evaluate performance of both hardware and software components of computer systems and apply basic troubleshooting strategies as needed.

*B. Personal and Professional Use of Technology:* Teachers should apply tools for enhancing their own professional growth and productivity. They should use technology in communicating, collaborating, conducting research, and solving problems. In addition, they will plan and participate in activities that encourage lifelong learning and will promote equitable, ethical and legal uses of computer technology resources.



*C. Application of Technology in Instruction* Teachers should apply computers and related technologies to support in their grade level and subject areas. They must plan and deliver instructional units that integrate a variety of software, application, and learning tools. Lessons developed must reflect effective grouping and assessment strategies for diverse populations.

It is also important to keep in mind that ICTs in education are a potential double-edged sword—while ICTs offer educators, tools to extend education to hitherto inaccessible geographic regions, and to deprived children and empower teachers and students through information, there is also the danger that such technologies may further widen the gap between the educational *haves* and *have-nots*. However, technology is only a tool and the success of ICTs in enhancing the delivery of quality education to the needy, without widening the gap, will depend largely on policy level interventions that are directed toward how ICTs must be deployed in school education.

Although ICTs do offer many beneficial opportunities for education, they are no substitute for formal schooling. The role of technology is to support school education and not replace it, though the technology may play an appreciable part in meeting the needs of children who cannot go to a conventional school. Access to ICTs ensures enhancement of traditional or formal education systems, enabling them to adapt to the different learning and teaching needs of the societies.

#### **Potential drawbacks of using ICT in education**

Although ICT offers a whole lot of benefits there are some risks of using ICT in education which have to be mitigated through proper mechanisms. They are:

- It may create a digital divide within class as students who are more familiar with ICT will reap more benefits and learn faster than those who are not as technology savvy.
- It may shift the attention from the primary goal of the learning process to developing ICT skills, which is the secondary goal. It can affect the bonding process between the teacher and the student as ICT becomes a communication tool rather than face to face conversation and thus the transactional distance is increased.
- Also since not all teachers are experts with ICT they may be lax in updating the course content online which can slow down the learning among students.

- The potential of plagiarism is high as student can copy information rather than learning and developing their own skills.
- There is a need for training all stakeholders in ICT.
- The cost of hardware and software can be very high.

**Conclusion:** Quality in education through ICT and its awareness among stakeholders will have positive impact on the society. ICT can be helpful in quality and standards of education by implementing it in various phases of education. ICT can be employed in formal and Non-formal types of education and would eventually make the learners employable and socially useful part of the society. By employing ICT in teacher training can save a lot of money of the Government. Moreover a lot of qualitative improvement can be seen as resource persons for the training can be best of the world. By employing ICT in administration can help in solving the problem of Absenteeism of students and teachers. Good quality content is one of the major issue and directly affects the standards of education and quality. By overcoming the certain challenges involved in the process of education can help a lot in this side. Conclusively a lot of quality improvement is possible after careful and planned implementation of ICT in education by various stakeholders. Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. However there exist some risks and drawbacks with introducing ICT in education which have to be mitigated. Successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipment. Also proper controls and licensing should be ensured so that accountability, quality assurance, accreditation and consumer protection are taken care of. ICT enabled education will ultimately lead to the democratization of education.

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