

Information and Communication Technology in Education: Innovations Methods in 21st Century

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Abstract

ICT is emerging as a big stimulating force and there is urgent need to integrate ICT with education because of several opportunities. In view of ICT, education can be classified in four main categories. Emerging challenges for ICT use are related to infrastructure, teacher, capacity-building, technical support, language and content. Cloud computing, e-learning, M-learning, Web 2.0, Simulation are newer examples of way of technologies that can be made integral part of educational institutions at a mass level.

“Technology is the non linear tool for accelerated economic growth, and the foundation for the sustained development of the nation.”

APJ Abdul Kalam, 2010

1. Introduction

Improving education is a goal shared round the world. To be ready for the 21st century challenges today's young people including teacher must know how to harness technology to

solve complex problems. Currently, education is being reshaped by the synergy of parental expectations, political initiatives, changing demographics and emerging technologies. Educational institutions are being asked to be more accountable for what in class rooms and to ensure that all students meet the ever higher learning standards. At the same time, emerging technologies raise questions and provide alternatives how best to educate students, prepare educators and provide continuing professional education for practicing professionals. These confluences of forces calling educators to think differently about their role in the preparation of students and how best they can position themselves in highly competitive educational environment. Teachers have a very important role to play in the use of technology and accept even their mistakes as an important part of learning process. They have to guide and motivate students in the implementation of Technology Aided Learning(TAL), by providing various platforms to help them to share their knowledge and experiences and to showcase and reward exemplary implementation of TAL (Bhatia,2005).

2. ICT and Education

ICT is emerging as a big stimulating force which not only influences the human cognition and its thought process but also help human to construct knowledge (Jha, 2007). There is urgent need to integrate ICT with education because of several opportunities it provides. It enhances teaching learning process by making it more effective and interesting. It improves availability of study materials and supports distance education and e-learning. It improves enrolment by convenient admission and examination process. It assists in research activities. Technologies do not guarantee effective learning, yet appropriate uses of technologies make learning more easily. India should grab opportunities using ICT.

In view of ICT, education can be classified in four main categories: e-learning, u-learning, blended learning and Distance learning. Electronic learning (computer-enhanced or online learning) is commonly associated with the field of Advanced Learning Technologies (ALT) dealing with both the technologies and associated methodologies. Ubiquitous learning fulfills e-learning promise of ‘anytime, anywhere and any context’ by core ‘knowledge pots’ work related content, personal knowledge, and internet. Blended learning combines face-to-face classroom instructions with online learning. Modern distance learning programs includes a Computer Based Training (CBT) system and communication tools to produce a ‘virtual classroom’. In view of implementing ICT in education, the process of teaching and learning in institutes is divided in four main stages:

Stage: 1 - Discovering ICT tools, Stage: 2– Learning how to use ICTtools, Stage: 3 – Understanding how and when to use ICT tools to achieve particular purposes, Stage: 4 – Specializing in the use of ICT tools(Muthuchamy and Thiyagu, 2010).

Leading institutions in India have undertaken several ICT initiatives. India has made substantial improvement to integrate ICT in education; however our educational institutions still encounter numerous challenges. The main challenge is availability of ICT infrastructure including electricity and connectivity to operate ICT services properly. Teacher related challenges are due to deficiency in five important competency namely, skills with particular applications, integration into existing curricula including challenges in instructional design, changes in the teacher role and underpinning educational theories. Managing the change is a major problem as teachers do not want to accept change easily. Capacity-building related challenges are due to lack of effective training at pre-service and in-service level. Providing pedagogical training for teachers, rather than simply training them to use ICT tools, is an important issue. There are also challenges due to lack of technical support during installation, operation and maintenance of technical equipment including software, network

administration and network security. Curricular related language is another problem as 80% of online content is in English. Effective leadership is required before, during and after project implementation. Sustainability in term of financial and project support is required. Contents and services should be need based of target population. Partnership with local stake holders is of crucial importance as the success of ICT initiatives is enhanced with the involvement of community participation. Gender and disadvantages groups need sensitivity as they are left out of the initiatives associated with the introduction of new technology. However, the new technology is capable of overcoming the barriers due to its increasing importance and use in education (Rout and Singh, 2010).

3. ICT Innovations

Earlier the trend was to use stand alone technology but now technology innovation and convergence towards complete solution has become the mandate of hours. Teachers have the ability to recognize and design environment to maximize learning opportunities with the use of new learning models. Technologies enable creation of learning objectives that revolutionize how education is delivered and received. Cloud computing, e-learning, m-learning, web 2.0, Simulation are never examples of way of technologies that can be made integral part of educational institutions at a mass level (Kaur and Pandey, 2000).

Cloud computing is an emerging technological approach to share infrastructure and computational resources to reduce budget impact. In cloud computing hardware, software and the information are held on a centrally located server on the internet rather than on a client computer. All that is access device (mobiles, laptop, ipod) having internet connection and a web browser.

One of the greatest growing trends in the education is e-learning known as “any time any place at any pace” principle of learning. It produces more learning at lower cost and 24x7

accessibility of resources and faculty from all over the world. Through pre-uploaded lectures, assignments, e-classes, online forums and test individuals can view, interact, participate and study from places of individual convenience.

M-learning provides all the flexibility and accessibility of the mobile technology to those desirous of learning due to ever growing strength of mobile users even in the rural belts. To promote M-learning, the campus of educational institutions should be Wi-Fi enables. Some form of surveillance like CCTV should be placed in the campuses as well as in the classrooms in order to prevent misuse.

The term Web 2.0 states a renaissance for web resources and tools by containing collaboration and social interaction (Kesim and Agaoglu, 2007) during the 1990's, the World Wide Web provided a way for people to use a network of computers to efficiently exchange files. In Web 1.0 content (HTML, pages and media files) was created by a relatively small group of individuals: created content were uploaded to servers and then downloaded by "content consumers" by using a web browser to display web pages. Web 2.0 is the term used to describe a variety of web sites and applications that allow anyone to create, share, collaborate and communicate online information. The main objective of Web 2.0 applications are available and have potentials in teaching and learning. Some of these tools include: social media sharing, audacity for podcasts means audio files, Slideshare for presentations, weblogs (i.e. Blogger), wikis (Wikipedia, Media wiki, PB Wiki), social boot marking tools, social networking tools i.e. EduSpace, Facebook, MySpace, virtual 3D community, social library tool, web syndication, Tag Clouds, Podcasting, Mash-ups, peer-to-peer Networking (P2P), Really Simple Syndication (RSS), Screen recording, Mind mapping, Digital storytelling, content hosting services and micro blogging i.e. twitter. The most primordial motive to use Web 2.0 is that most of the students are already actively involved in the content creation

outside the premises using tools and shows clear preference for the websites rather than books (Hussain, 2010).

Blog serves as another IT tool that enables learning. Edublogs offer students the opportunity to surface their ideas in a social plane. Scaffolding of the meaning making process carried out through commenting further enhance learning and supports the internationalization of knowledge by allowing students to look back at their archives posts. Blog affords educators an opportunity to transfer the ownership (both of blogs and learning) to students by leveraging many features of bolgs; teacher should be examine their existing processes and consider how blogs can replace some of their existing practices (Talawar and Kumar, 2010).

Simulation is the imitation of some real things or process and once simulator becomes more than a ‘living’ text book, it will become an integral part of the practice of Education. Thus simulation is termed as “web based classroom of the future” that will probably contain several kinds of simulators, in addition to textual and visual learning tools. Training simulation typically come in three categories- live, visual and constructive simulations. Simulation in education focus on specific tasks that allow students to enter the years better prepared and with skill level. The advanced students will have a more concise and comprehensive methods of retraining or of incorporating new procedures into their skill set. It makes easier to find proficient and competent individuals by regulatory bodies and institutions (Talawar and Kumar, 2010).

4. Conclusion

Nowadays ICT offering an integrated range of tools to support learning and communication are becoming a major medium for learning in every discipline. The use and implementation of ICT involves the rationalization of administrative routines, communication

and transmission of knowledge, while at same time preventing any serious negatives impact on pedagogy and teaching condition (Vuorikari, Maouselis and Duval, 2009). To conclude there is an urgent need not only to integrate ICT with education but also to make ourselves capable enough to use in such a manner so that we can situate teaching and learning with judicious and active help of ICT.

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