



## ICTs in Teaching-Learning Process

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### **Abstract**

*ICTs are making dynamic changes in society. They are playing vital role in every aspect of human life. The role of technology in teaching and learning is rapidly becoming one of the most important and widely diffused issues in contemporary education policy. Teaching-learning process is not now limited within the boundaries of Classrooms. This article discusses the meaning & definition of ICT, various components of ICT, ICT in education, benefits of ICT in Education, benefits of ICT in teaching-learning process. The main thrust of this article is how ICT tools are helpful in classroom transaction. Use of various Web 2.0 technologies for making teaching – learning process more interactive and interesting are also discussed in this article.*

**1. Introduction:** The present era is the age of Information Communication Technology .Due to the advent of ICT & IT, life has become easier. Now the educational institutions all over the world are integrating ICT with the teaching - learning process in order to provide knowledge and skills to the learners to meet the challenges of educational environment. Jeelani (2011) rightly remarks, "It is only through education and the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change". In Watson's (2001) description, ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world. This is a sufficient reason for ICTs to win global recognition and attention.

**2. Meaning and Definition of ICT:** ICT means Information Communication Technology. It has three parts Information, Communication and Technology. Information is the

summarization of data. Technically data are raw facts and figures that are processed in to information.

Communication is a process which disseminate information and Knowledge .And Technology is a mode or media through which information can be disseminated. So ICT is the technology required for information processing and spreading. ICTs are technologies such as radio and the newer digital technologies like computers, satellites, mobile phones and the internet.

**3. Components of ICT:** ICT includes communication devices and applications like computer, hardware networks, software, mobile technology, satellite communication, video conferencing, RFID Technology, WI-FI zone, pen drives, Internet, www, Web2.0 and Social media etc.

**Satellite communication:** The age of satellite communication dawned in 1962 with the launching of Early Bird, the first communication satellite. The two big international satellite systems Intelsat and Intersputnik began operating in 1965



and 1971. India launched a satellite for communication called INSAT and for Education purpose EDUSAT was launched in the year 2004. INSAT - 4CR was launched on 2 September 2007 by GSLV-F04.

**Video conferencing:** It is a two way communication system. It is also called teleconferencing, is the use of television video and sound technology as well as computers to enable people in different locations to see, hear and talk with one another.

**World Wide Web:** The World Wide Web, known as www is one of the several internet resources developed to help, publish, organize and provide access to information on the Internet.

**RFID Technology:** Radio Frequency identification is the wireless use of electro-magnetic fields to transfer data, for the purpose of automatically identifying and tracking tags attached to objects.

Now a day's RFID can be used library circulation operation and theft detection systems. RFID - based systems move beyond security to become tracking systems that combines security with more efficient tracking of materials through the library, including easier and faster charge and discharge, inventorying, and material handling (Boss 2004).

**Advantages of RFID:**

1. It reduces staff time.
2. High Reliability.
3. Minimal human intervention.
4. High speed inventorying.
5. Long tag life.
6. Automated material handling.

**Disadvantages of RFID:**

1. High Cost.
2. Accessibility to Compromise
3. Removal of exposed tags.

4. Exit gate sensor (reader) problem.
5. Lack of Standard.

**Web 2.0:** The term was coined by Tim O'Reilly at the O'Reilly Media. Web 2.0 describes World Wide Web sites that use technology beyond the static pages of earlier web sites. Social Media, Blogs, Wikis, Video sharing are all based on Web 2.0 Technology. With web 2.0 tools, users can communicate around the world with a nominal cost. It allows population to correspond and spread ideas with each other rather than receiving the information from a single source.

**Blog and Wikis:** Blogs and wikis are fundamentally web 2.0 and their global proliferation has enormous implication for libraries and also in teaching - learning process. A Blog is also known as web log or personal log is a web based publications consisting primarily of periodic articles. Blogs contains posts some time similar to journal entries, from a person or a group. A wiki is a collaborative web space where anyone can add content and anyone can edit content. That has already been published. Wikis are designed to help groups collaborate, share and build online content and are especially useful for learners who are separated by time and place. Wikis are quick to set up and easy to learn and edit.

**Types of wikis:** Wikis are available through a wide variety of services and open source software tools and generally fall into three categories, each with its own set of strength and limitations:

- Free wiki services. Fee - based wiki services
- Self -hosted wikis (Noushad, 2012)
- Fee-based wikis are also hosted and accessed from the wiki services web server. These services offer expanded features based on the type of subscription you select. Self hosted wiki software can



also be installed directly on a personal or campus controlled service space. A variety of free, open source wiki software is available for down load from internet, for example; Media wiki ([www.Mediawiki.org/wiki](http://www.Mediawiki.org/wiki)) and Twiki ([www.twiki.org/](http://www.twiki.org/)). (Noushad, 2012)

**Social Media:** Social media are perhaps the most promising and embracing technology. They enable messaging, blogging streaming media and tagging .Some most commonly used social media are MySpace, Face book, Del.icio.us, Frappr and Flickr networks that have enjoyed massive popularity in web 2.0. It is based web2.0 technology.

**4. Role of ICT in Education:** Information Technology can provide a medium for teaching and learning and contribute flexibility to course provision. The valid uses of information Communication Technologies are:

- . Distance learning via electronic networks.
- . Open learning through students controlled learning pathways.

Presently there are four areas of education namely: Teaching, Learning, Curriculum and Educational programme. ICT has been added essentially in the 21st century as the fifth potent area of education (Sampath, 2011). According to the revised Draft on National Policy Information Communication Technology in school education.

ICT has made the class-room transaction more interesting. Students are now able to use laptop computers and wireless networks anywhere in campus. ICT brings the outside world in to the classroom teaching learning process, makes the things more realistic and thus helps the learners to understand the abstract thought very clearly.

ICT can improve the quality of

higher education by promoting experimentations, researches and innovations, adopting the new strategies in the teaching –learning process and integrating the new information with the best practices. In 1998 UNESCO world Education Report stressed the importance of ICT in higher education to generate quality education.

ICT has also played a vital role in providing distance education very effectively. IT provides online delivery of courses, online assessment and online design courses to large no. of students at a time

#### 4.1. Application of ICT in Education in India:

In India, application of ICT in Education was started few years back and it has become a vital part of our daily life. Presently ICT in India has greater potentialities and a promising future because our country possesses one of the largest ICT workforces in the world and there is a growing awareness building among the educationists, stakeholders on the emerging role of ICT in enhancing the process and out-come of education.

Sarva Shiksha Abhijan (SSA) – a mission of the Indian Government to achieve the UEE , also stresses the importance of ICT in educational sector. Presently the government of India has taken various initiatives to integrate ICT in educational sector to facilitate information dissemination and communication in every area of education.

Our Prime Minister, Narendra Modi said that Information Technology is becoming the growth engine which has the potential to transform India into a Knowledge Economy and Society.

Even though computer have been



introduced in schools in India, The education system has largely not been influenced by the potential for pervasive change intrinsic to ICTs. The stress laid on implementing ICT in elementary level by replacing the erstwhile Computer Aided Learning (CAL) under SSA which would include provision of networked computers, accessories and an Internet connection in a phased manner .

#### 4.2. Benefits of ICT application in Education:

- . ICT increases the access to education.
- . It improves the quality of education by developing new ways of interaction and also makes teaching –learning process more interesting.
- . It provides equal opportunities to the large number of learners to obtain education and information.
- . It provides specialized tools for learners with visual, hearing or mental impairment, so that they learn and acquire knowledge at their own pace.
- . It provides support to each and every school in sharing educational / learning experiences with the different schools throughout the country.
- . It enables the distance education system to be more effective.
- . It helps in promoting technology literacy to every citizen and especially to young stars.
- . It enhances the teacher's quality both in terms of teaching and research.

**4.3 ICT in Classroom Instruction:** The systematic use of ICT tools in classroom instruction makes the teaching learning process more effective and highly interactive. It has shifted the teaching - learning process from teacher – centered learning to student centered learning. The effective and efficient use of ICT in classroom instruction depends on:

- a) ICT literacy of Teachers
- b) Effective use of ICT hardware and software for teaching –learning activities
- c) ICT – based pedagogy, online support, networking and management.
- d) Adopting best innovative practices in the use of ICT.

#### 4.4. Various ICT tools used in Classroom

**Instruction:** The following are some of the technological tools used in teaching – learning process. These are, Computer-Aided Instruction (CAI), Computer – Assisted Learning (CAL), LCD projector, PowerPoint Presentation, Smart board, E-mail, Discussion forum, Wikis, Blogs Social Media, YouTube, CCTV, Video conferencing , Teleconferencing , Google earth, Google Maps , School tube, Teacher Tube, Flicker, Classroom 2.0 Ning etc.

**Computer-Aided Instruction:** Computer, as an aid to the instruction, involves a set of programming Instruction which is used in the teaching - learning process to develop certain skills among the learners. Here, the computer is used to present, drills, practice, exercise and tutorial sequences to the students, and some time to engage the students in a dialogue about the substance of the instruction .It appears that computer is used as teaching aid for a teacher. So Computer – Aided Instruction is a type of Instruction which is used to achieve the objectives of the Instructions.

CAI work as a teaching aid and it facilitates psychological based learning, self- pacing and individualized instruction on the part of the learners.

**Computer assisted learning:** Computer Aided Learning is the use of computer to aid or support the education or training of people

CAL represents the next phase in the use of computers in education in which an attempt was made to correct



the negative aspect of CAI.CAI is to convey a vast amount of information in a very short period of time .It is a powerful method of reinforcing concepts and topics first introduced to you through textbook and discussion in the classroom.

**LCD Projector:** An LCD projector is a type of video projector for displaying video, images or computer data on a screen or other flat surface. It is a modified version of over-head projector or slide projector. It is used as teaching aid in classroom transaction for displaying image, chart, PPT etc.

**Power Point Presentation:** Slide presentation software such as Power Point has become an ingrained part of many instructional settings. Particularly in large classes and in course more geared toward information exchange than skill development.

Potential benefits of using Power Point Presentation are :

- . Engaging multiple learning Styles.
- . Increasing visual impact.
- . Improving audience focus.
- . Increasing spontaneity and interactivity.
- . Enriching curriculum with inter - disciplinarily.

**Smart Board:** The smart board is an interactive white board that uses touch detection for user input (for example, scrolling and right mouse -click) in the same way as normal PC input devices. The white board accepts touch input from a finger, pen or other solid object .Smart board can be used in classroom instead of blackboard or whiteboard. The components are connected wirelessly or via USB or serial cables. A projector connected to the computer displays the desktop images on the whiteboard.

**Use of Smart Board in classroom:** Smart board is also called touch board is one of the world's largest manufacturer

of interactive white boards and they have coined the term smart board.

- It can be used as teaching aids.
- Teacher can use smart board by sharing lesson plan and ideas with each other , through internet .
- Smart board also has games for children which can be played by teacher on interactive white board for making students motivate towards lesson.

**Discussion forum/News Group:** They are on-line discussion groups on many topics of varied interest. Discussion allows open exchange of messages on a topic of common interest. Electronic – based discussion groups can alter the classroom structure and dynamics. It makes the classroom transaction more interesting and also removes the monotonousness of traditional classroom situation.

**Blogs and Wikis:** Blogs and wikis are based on web2.0 technology. These are asynchronous mode of communication. Authoring a blog, maintaining a blog or adding an article to an existing blog is called blogging. Individual articles on a blog are called blog post, post or entries. Wiki is an online collaborative writing tool. Wikis are designed to help groups collaborate, share and build online content and are especially useful for learners who are separated by time and place. Some Educational use of Blog and Wikis are:

**Blogs:**

- The can be used to inform students of classroom requirements, post handouts , notices homework and assignments or act as a question and answer board.
- It provides conversation between batch mates in larger classes.
- It provides new chancels of information and knowledge from anywhere anytime.

**Wikis:**

- It enables and promotes group collaboration ,editing and revising





- It maintains and builds a repository of content and material.
- Empower learners through a more democratic, open philosophy of learning and sharing
- Help students experience the messiness of group collaboration, problem solving and critical thinking.
- Wikis can be used to map concepts. They are useful for brainstorming, and editing a given wiki topic can produce a linked network of resources.
- Teacher can use wikis as a knowledge base, enabling them to share reflection and thoughts regarding teaching practices.

**Social Networks:** Social Networks is an interactive media, which is based on Web2.0 technology. People can share information, upload photos/videos post comments etc. on social media. It is a synchronous way of

communication. People can instantly communicate with each other.

**Use of social media:**

- Students can use social media to discuss class related topics with their peer-mates and with their teachers.
- It helps student's experiences the messiness of group collaboration, problem solving and critical thinking.
- Teacher can use this media to inform students various class related topics, post handouts, notice etc.
- It provides Synchronous communication between learners and teachers and provides new channels of information and knowledge from anywhere anytime.

**Google Earth:** Google Earth makes Google Maps in 3D visual, 3D Globe for your computer that includes traditional mapping, layered terrain, cultural landmarks etc. Teachers in all content areas can use can use Google Earth for

numerous interactive lessons. Maps and explorations can be built, shared, saved and exported into movies and other presentations.

**Google Maps:** It provides information about standard maps direction, as well as real time traffic information in majors cities, satellite views, and saved maps and directions. It is an essential tool for both teachers and students. It helps the students in creating directional maps that provide a narrated vacation trip or a recreational of an historic explorer's path across the world etc.

**Flicker:** Flicker is a Social Media. Flicker enables the sharing of picture. It is a social photo sharing sites. User can view comment and subscribe to photo streams, establish private groups for photos, and use the photos in numerous ways under creative common license. Teachers can establish banks of thousands of photos, very easily categorized by topic and need, so that students pull from these photos for various classroom projects.

**Classroom 2.0 Ning:** This is a social networking site for educators. Ning is commercial web sites that offer user-generated social Networks. Students spend countless hours in social Networks connecting to friends, creating original work, chatting, sharing photos and so on. (Thiyagu, 2013)

**Twitter:** Twitter is a micro blogging tool. Twitter can be used by teachers to set up 'class blasts' that are sent out to students at any time about current topics, timely events or question etc. In addition, teachers can use Twitter easily to send out class - wide announcement and can distribute these short blasts of information via web, email or cell phone text message.

**Class tools:** It creates free web-based educational games, activities and



diagrams using Flash but with an easy to use interface, host them on your own blog, web site or Intranet. Teachers and Students can create their own tutorials, demonstrations, diagrams, animation on class tools.

**Mobile learning** : The term M- Learning stands for mobile learning., which means learning with the help of hand held technology such as Mobile Phone, Laptop and other portable devices. M- Learning also brings Strong portability by replacing books and a note with a small RAM's filled with tailored learning contents. It can download a PDF File or E-books with the help of Android or Windows Phone and store it in its RAM.

**Use of M-Learning in classroom transaction:**

- ❖ Teacher can record their lecture and upload it as a podcast and can share their link with their students.
- ❖ Through text messaging with teachers , students can clarify their doubt related to classroom lesson while reviewing the lesson, and teacher can answer them instantly or in the next class or can direct them to the reference sources where they can meet their query.
- ❖ Teacher can create short list of salient points like history dates, exam hints, short summaries etc. which can be shared with students through messaging.
- ❖ Mobile dictionary can be used by the students to build vocabulary.
- ❖ Teacher can allow their students to take 5 minutes to study the National Geography using Google Maps.
- ❖ Mobile phone makes it easy for the Students to discuss class related topics with their peer mates and their teachers in social media/social networks.
- ❖ Mobile learning allows group learning of students when they are working same projects.
- ❖ Teacher can ask a new question

related to the subject taught in the class and let their students to find out answer from internet sources by using Mobile phone and to see how quickly they find out the answer. This will enable to know how well they understand the topics.

**Advantages of M-learning:**

- ❖ Mobile devices are cheaper than desktops or laptops.
- ❖ M-learning can be used anywhere anytime including schools, colleges, offices, homes etc.
- ❖ Fast & easy accessing of information
- ❖ Motivates the students with multimedia facilities .
- ❖ Enhances and compliments traditional teaching styles.

**Disadvantages:**

- ❖ Devices may become outdated quickly and students have to keep combating obsolescence.
- ❖ Mobile Network has limited bandwidth.
- ❖ With the help of Mobile Network people can download file but cannot print out the material.
- ❖ Mobile learning can create eye sight problem also.

**4.5. Benefits of ICT in Teaching Learning process:**

- ❖ ICT can make the teaching learning process more interactive and effective.
- ❖ It helps in motivating the students towards their lesson.
- ❖ Learners can learn and work at their own pace just with little guidance from the teachers..
- ❖ Learners can get various information very quickly.
- ❖ IT also helps the teachers to evaluate the learner's progress and proficiency in certain skills.
- ❖ It can also remove the monotonousness of traditional classroom system.
- ❖ Encourages contact between students



and faculty through social networking tools, blogs, wikis, text message etc, especially those students who are shy and unable to speak out in face-to-face classroom settings.

#### **4.6. Problem faced in implantation of ICT in Teaching –Learning process in Indian Context:**

- ❖ Lack of proper infrastructural development in rural areas.
- ❖ Underpinning educational planning
- ❖ Frequent power cut problem. Most of the village schools are still starving for proper electrification.
- ❖ Lower bandwidth capacity than developed country.
- ❖ Lack of ICT awareness among the mass. Now it is high time for the people to change the mindset and accept the new technology for their future academic growth.

**5. Conclusion:** Transition, Transformation and Revolution is the scenario of today's educational system. Application of ICT in education and teaching learning process has changed the traditional system of learning to modern ICT based learning. Teaching-learning process is not now limited within the boundaries of classroom. The modern technologies including new web 2.0 has changed the total scenario of teaching learning process. ICTs are making major's difference in the teaching approaches and the ways students are learning. ICT - enhanced learning environment facilitates active collaborative, creative, integrative and evaluative learning as an advantage over the traditional method. Several surveys are showing that ICT use in education system of developed nations is comparatively advanced than ICT used in education system of developing countries. ICT use in education system of developing countries is also facing some

challenges. ICT introducing innovative pedagogies in to the classroom, creating network among educational institution, improving overall standard of education by reducing the gap between the quality of education in urban area and rural area, initiation of smart school with objectives to foster self-paced, self assessed and self-directed through the application of ICTs, and developing ICT policy for education and training.

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