



INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION SYSTEM: CURRENT TRENDS

Dr. Dilip B. Shinde¹ Mr. Vikas Shivaji Shinde²

¹Principal & Research Guide, MVP's K. K. Wagh College, Pimpalgaon Baswant Tal. Niphad (Nashik)

²Assistant Professor in Commerce, MVP's Arts & Commerce College, Khedgaon, Tal. Dindori, Dist. Nashik

Corresponding Author- Dr. Dilip B. Shinde

Email- vikas.shinde199@gmail.com

DOI- [10.5281/zenodo.7070174](https://doi.org/10.5281/zenodo.7070174)

Abstract:

Education is essential for economic development, innovation and growth. But it can also be expensive and hard to get access to. In the current education sector, 'Information and Communication Technology (ICT) plays a vital role in the process of empowering and using the technology in various educational activities. This Educational field can effectively anticipate the negative impact of ICT and eliminate that impact. This technology of Information & Communication in the education field effectively increases the student's knowledge. The use and implementation of ICT in education increase the intrinsic value of teaching and learning by enhancing effective learning from the student's side'. It added measurements, standards and various dimensions to understanding which isn't traditionally available. After the regular use & implementation of ICT tools in schools and colleges, students learning activities will enhance, stimulate and engage in an ICT environment more than in an environment like a traditional Classroom.

Keywords: Digital education; ICT; M-learning; E-learning; Teaching and learning.

Introduction:

Use and implement 'Information and Communication Technologies' (ICTs), including various platforms like Digital Technology, Computers, Internet, Virtual Library, Social Media Applications, television, radio and so on. All these platforms worked as supported & powerful ICT-enabled tools for new educational change and revolution. When used appropriately, 'ICT tools help extensive access to education holders, strengthen the relevance of education to the digital workplace and increase academic quality, which helps make teaching and learning activities into an engaging, connecting and active process for the real-life education achievers'. However, the experience of introducing various ICT tools in the classrooms, other educational platforms and 'all over the world past several decades

suggests that the full realization of the potential educational benefits of ICTs is not automatic' [5].

The effective integration and implementation of ICT tools into 'the educational system is a complex nature and multi-viewed process, which includes not just indeed technology, enough initial capital, getting the technology is the easiest part but also teachers' competencies, curriculum and Teaching methods, institutional readiness and long-term financing among others' [1]. This is intended to help policymakers in developed & developing countries define a framework for the appropriate and 'effective use of ICT tools in their educational systems by providing, firstly, a brief overview of the potential benefits of the service and implementation of ICT tools in the education field and the various ways in

which different ICT tools have been used in education' [11]. Secondly, it addresses the essential and 04 broad issues in using ICT tools in education, like effectiveness, cost/expenses, equality and sustainability. The researcher concludes with a discussion of the significant 05 key challenges that policymakers in developing countries must know when making decisions about integrating ICT tools in education, like educational policy and planning, financing, capacity building, language & content and infrastructure [4].

President of ICT and Skills, Smart-class Educational Services Pvt Ltd, Hon. Shri. Ashok Mehta explained his views on the industry; "they discussed the presence of ICT tools in the Education field and tried to work on appropriate solutions by integrating ICT tools.¹ He further added, a report highlighting the problems & challenges in education, ICT has an important role in addressing the issue of quality content and quality of teachers. From the Covid-19 pandemic situation, the global role of ICT tools has been acknowledged and appreciated. ICT facilitates the exchange of E-data among the students and teachers successfully; once teachers have appreciated it, they try to achieve academic goals" [12]. Ministry of Human Resource Development has already focused on "the importance of ICT tools in education, and some schemes have already been started by the government where

Objectives of the use of ICT:

1. Bridge the differences amongst 'the learners, teachers & other stakeholders'; this leads to effective interaction and transparency.
2. Equal importance is given 'to promoting the culture of learning at schools and colleges and supporting sharing of experience and information with others' in the field of education.

Hypothesis of the research:

1. The use of information and communication technology is increasing in the education sector
2. The use of information and communication technology is improving

some companies like Smart-class and Google classrooms have made a huge contribution" [9]. An ICT tool plays a catalytic role in enhancing learning activities in Classroom and beyond [2]. The President of Smart-class Educational Pvt Ltd. said, "One needs to do due diligence before a content provider is selected as content is the Fundamental base".

Miss Mitsuyo Tamai, 'the founder of Kiwami', expressed her thoughts on the effectiveness of ICT tools in education. She said, "Looking at the present education scenario, various changes have taken place in the teaching-learning activity, assessment and evaluation. Information and communication technologies are extremely influencing every discipline, including Education. It affects every aspect of education, from teaching-learning activity to assessment and evaluation. It improves the effectiveness of education. It is a useful tool in the literacy movements. It expands the scope of education by facilitating E-learning, mobile learning, and online and inclusive education. It also facilitates research and scholarly communication" [3]. "The impact of ICT tools and their potential for education is manifold. Judicious use of ICT technologies and new teaching-learning functions and roles of education personnel can bring about a more efficient and effective teaching-learning process." [13]

the quality of teaching and learning systems.

List of ICT tools used for Teaching and Learning:

A list of examples of ICT devices that can be used in teaching and learning. ICT devices used in teaching-learning activities are divided into hardware, Software and Network communication. The technological tools are suitable for students as well as teachers.

General ICT tools for teaching and learning:

Computer Screen/Desktop and Laptops, Projector, Printer, Photocopier, Tablets, Poppet, Pen-drive, IPods, Ipads, Web-

boards, Scanners, Microphones, Interactive White Board, DVD's & CD's, Flash Disc's, Video Games etc.

Special Needy Education ICT tools for teaching and learning:

Audio books, Text Magnifier, Head wands, Keyboard for brain Percy, braille, typing aids, large prints.

Digital tools for teaching and learning:

M-learning, E-learning, Dnyandarshan TV Channels, & Various Mobile Apps.

M-learning, E-learning:

Mobile learning is increasingly seen as an essential and primary tool in improving learning opportunities in India. It is an interesting long-range missile in education technologies. For various reasons, traditional education's physical infrastructure and accessibility are often inadequate. Recent Schools and Colleges are overcrowded, under-resourced libraries and lack essential teacher training. Despite attempts at improving the system, retention of both pupils and teachers is low, and learning outcomes are poor. It is always said that "a country like India has a young population. Approximately 50% of the population is under the age of 15 years, and around 200 million young people are between the ages of 15 to 24 years. Added to this, India is the world's fastest-growing economy. All these young people will be the driving force behind the country's sustainable growth. But an unskilled and uneducated workforce is a stumbling block to further development and maintaining it. With this issue in mind, investing in education and training is more important than ever. For the inside area to maximize its economic growth potential, it is necessary to expand educational opportunities and cut its price. The possibilities provided by the advancements in Education Technologies come into play [6]. Some essential ICT Tools are given as follows:

M-learning:

The definition of M-learning and its difference from e-learning is not well-defined. It can mean different types of things according to their use and

application. In general, E-learning is rooted inexpensive computers and internet access, and M-learning is based on SMS service and the easy use of the mobile phone. An increase in the use of general mobile phones means many Indians are now able to access various learning applications directly. Text message facility delivers training to people living in remote areas and weak educational infrastructure. This is important because education standards are directly linked with increasing innovation and wealth. Recently, various mobile applications have been available for teaching and learning by way of M-learning.

SMS facility support in school:

The interactive nature of mobile technology means it can offer support facilities and backup facilities for students and teachers in schools and colleges. Information can be broken down into small pieces and sent as a regular text message, which helps teachers deliver the curriculum correctly, or educational messages can be sent straight to the students. Both teachers and students can interact with their peers via messages that help them feel supported and stay motivated. Especially this form of M-learning is helpful as a free service. With mobile text packages becoming more and more affordable, it means teaching & learning should not incur extra costs. Social networks like WhatsApp, Facebook, Twitter, YouTube, and so on can also be accessed for sharing lessons and other support. This should lead to better retention of students and teaching staff by better learning outcomes in the field of education.

ICT tools and devices for Teaching & Learning-Definition:

The following examples of ICT tools, devices, hardware and infrastructure provide an overview of some of the technologies you will encounter as you teach and interact with learners of all ages. The exhaustive list is intended to guide your thinking, planning, and future questions about if, how, why and when to use different ICT forms in your teaching.

Some examples of tools, devices and infrastructure are as follows [7]:

Use of Web-based Tools and Applications for managing teaching and learning:

Student Management Systems: This system includes financial, time-tabling, student assignment records and daily reporting. It may also enable parents to review their child's performance online

Virtual Classroom Software Systems:

This system delivers “an interactive learning environment to students with a computer system and Internet connection. This software provides various platforms to students with a screen consisting of an instructional area, class location, message/notice board, floating board etc”.

Digital Student Report Card Systems- Recently, a digitalized system for transmitting student information can embed real examples of a student's work from an e-portfolio. This system provides a magnified chief cum report card, which is helpful to students for giving daily records such as attendance in the Classroom.

Plagiarism Detection Systems:

This system “examines & scanning digital text and, by comparing the nature and frequency of particular word strings, provides feedback to the educator on the likelihood that a specific piece of work has been plagiarised”.

E-Portfolios

(Electronic/digital portfolio): This system provides a digital storage facility, which enables an individual to maintain a proper ongoing record of their activities, routine work, notable achievements, awards and assessments. The above exercises are considered portfolios in education by preserving digital records.

Online Collaborative Workspaces:

Some online communication tools are used for teaching and learning, which enables an individual to participate in the collaboration—examples: Bulletin board, Email discussion lists, etc.

Teaching and Learning tools:

using web-based tools and applications [8, 9].

Learning Management Systems:

Various Internets-based software that deploys, manages, tracks and reports on the interaction between the teachers & learner and the content and the learner. This system allows students to register, track learner progress, maintain test scores, and indicate course completions. This also allows the instructor to assess students' performance regularly.

Personal Communication: Use of Digital communication tools in learning and teaching, “which enables individuals to talk to one person or more by using digital devices such as web forums, Internet relay chats, and SMS (short messaging service) on mobile phones”.

Interactive Whiteboards:

Recently, whiteboards have allowed users interactive communication in the education field. These whiteboard surfaces always display digital files from a computer via a digital projector. The digital application of the whiteboard is considered an appropriate tool for interactive communication between teachers and students. i.e. “the teacher or student may write on it and then digitize the marked-up material spontaneously”.

Mobile delivery devices: The digital storage:

Personal Digital Entertainment Devices(PDEs) and MP3 Players: This system enables the user to download, store and play audio, photo and video files and, in many cases, to take an active part in interactive activities.

Storage devices: such devices for transferring electronic work between various devices from one place to another and physical locations and to take backup of work done, e.g. USB drive.

Mobile phones: This device increasingly allows digital communication via photos, videos and text messages.

Personal Digital Assistants

(PDAs): Digital device like PDAs and Pocket-PCs allows input of data via a mini keyboard or equivalent tools. It usually

includes a digital calendar, organized functions and essential software functions such as word processing, email, spreadsheets, data storage and wireless capacity [10].

Tablet PCs: A small screen where a 12-inch laptop PC may be input directly on the screen with a special pen. This is the same device as screen-touch mobile phones and is primarily used by students in engineering, medical and various technical institutions.

Gaming Devices: Apart from continuous study, students want to enjoy some gaming activities. This digital device consists of various games or a content delivery method and gaming console (e.g. Gameboy).

Assistive and Adaptive Technologies: such technologies support disabled students with screen readers, blind students' digital tools and virtual pencils.

Laptops: This device, like a mobile computer, is operated with a specific battery away from power sources. Recent versions are wireless and can connect the system to the Internet in wireless hotspots.

Content delivery methods:

Blogs: Blogs are web-based journals or log books. An author or group of authors chronologically orders blogs and web postings. All blogs may be personal, individual, group collaborations or representative of an institution.

Digital TV: Digital TV is similar to analogue TV but can deliver rich and luxurious multimedia learning experiences. It enables interactive communication between teachers and students.

Podcasts:

A digital tool, podcasting is a method of publishing audio files via the Internet, which allows users to subscribe to a feed to receive new files automatically to get & understanding recent trends of knowledge.

Vodcasts: A digital tool, Vodcasts allows users to receive videos. Video on demand is the same concept as podcasting but with video files.

Wikis: A Wiki or wikis is a website (or other hypertext document collection) that allows users to add content on an Internet

forum but also allows anyone to edit some content. 'Wiki' also refers to the collaborative software used to create such a website in education.

Voice over Internet Protocol (VoIP) enables voice transmission across the Internet. E.g. Skype. The use of this digital tool increases the quality of Audio for clear communication of audio data in the education field.

Other devices, concepts, and technologies:

Digital Cameras: In this device, all types of films are stored digitally.

Moblogs and Photoblogs:

Moblog devices are combined with the words blog and mobile. It means the capacity to blog post items to a blog using a mobile phone or other mobile devices.

Scanners: This device enables the digitization of analogue content. Digital items can be manipulated by computer software and stored digitally.

Peer-to-peer Networking and Technologies:

This networking technology allows two or more computers to share their resources, such as hard drives, CD-ROM drives, DVD drives and printers. This enables teachers and students to share digital files locally and internationally in the field of Education.

Swarming (meetups):

In specific events/programs, some people come together quickly with a common interest to participate and perform their experience. For this, Mobile devices are often used to generate swarms. They may be used for educational, political or social reasons. E.g. learning swarms – in this event, students come together for learning.

ICT Based/oriented 7 Effective Teaching Strategies for the Classroom:

The Classroom is a dynamic environment for students, "bringing together students from different views, backgrounds, interests and involvements with various abilities and personalities. Effective teachers require creative and innovative teaching strategies to meet student's individual and educational needs.

Whether teachers have been teaching for two months or two years, knowing which teaching strategies will work satisfactorily with their students can be challenging. As a teacher, there is no solution for 'one view, one size & one practice fits all students'. Therefore here is given a range of effective teaching strategies which can use to inspire his classroom practice:

Technology in the Classroom:

Incorporating technology into teaching activities is a great way to actively engage students, especially as digital media surrounds young people in the 21st century. "In general interactive whiteboards or various mobile devices can be used to display images and videos, which help students, visualize new academic concepts. The learning activity can become more interactive when digital technology is used during lessons. Students can engage instantly in their research ideas, which develop autonomy". Recently **Mobile devices** such as Ipad and tablets can be used by students in the Classroom to **record results, take photos and videos** or incorporate **educational programmes** such as lesson plans and **assessments**.

Visualization effects:

Visualization effects bring dull academic concepts to life with visual and practical learning experiences; they help the students understand how their academic concept applies in the real world. This includes using the interactive whiteboard to display photos, audio clips and videos and encouraging students to get **experiential knowledge**.

Cooperative learning:

Encourage students of various abilities to work together by promoting small groups or class activities. Through cooperative learning, students verbally express their ideas and will, develop their self-confidence, and enhance their communication skills as well as critical thinking & problem-solving skills. **Solving mathematical tricks, illustrations, puzzles, conducting scientific experiments and acting out short**

drama sketches are a few examples of cooperative learning incorporated into Classroom.

Inquiry-based instructions:

Inquiry-based questions inspire students to think for themselves and become more independent, such as posing thought-provoking questions. This encourages students to ask questions, investigate their ideas using their problem-solving skills, and gain a deeper understanding of concepts.

Differentiation techniques:

Differentiate your teaching by allocating specific & small tasks based on students' abilities and ensure no student gets left behind. Assigning classroom activities according to students' unique learning needs means individual students with higher academic capabilities are stretched, and those students who are struggling get the appropriate support. This can involve handing out **worksheets that vary in complexity** to different groups of students or **setting up a range of workstations** around the Classroom.

Professional development:

Regular professional development activity is a proper way to enhance teaching and learning in the Classroom. With educational policies constantly changing, attending events where students can gain inspiration from other teachers and academicians is extremely useful.

Personality management:

Implementing an effective personality management strategy is crucial to gaining your student's respect and ensuring students have an equal chance of reaching their full potential. Noisy, disruptive classrooms do not encourage a productive learning environment; therefore, developing an atmosphere of mutual respect through a combination of discipline and reward can benefit teachers and their students.

Conclusion:

Due to the use of modern digital tools in the current teaching and learning system, the education system has improved and positively impacted the education sector.

Through the regular use of various digital tools, students are getting self-reliant education, and even from the Corona pandemic, everyone has obtained used to this.

References:

1. Ainley, J., Enger, L., & Searle, D. (2008). Students in a digital age: Implications of ICT for teaching and learning. In *International handbook of information technology in primary and secondary education* (pp. 63-80). Springer, Boston, MA.
2. Bakar, A. Y. A. (2016). "Digital Classroom": An Innovative Teaching and Learning Technique for Gifted Learners Using ICT. *Creative Education*, 7(1), 55-61.
3. Blau, I., Grinberg, R., & Shamir-Inbal, T. (2018). Pedagogical perspectives and practices reflected in metaphors of learning and digital learning of ICT leaders. *Computers in the Schools*, 35(1), 32-48.
4. Bindu, C. N. (2016). Impact of ICT on teaching and learning: A literature review. *International Journal of Management and Commerce Innovations*, 4(1), 24-31.
5. Enrique Hinostroza, J. (2018). New challenges for ICT in education policies in developing countries: The need to account for the widespread use of ICT for teaching and learning outside the school. In *ICT-Supported innovations in small countries and developing regions* (pp. 99-119). Springer, Cham.
6. Gran, L., Petterson, D., & Mølstad, C. E. (2019). Digital bildung: Norwegian students' understanding of teaching and learning with ICT. *Nordic Journal of digital literacy*, 14(1-02), 23-36.
7. Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, 4(2), 38-57.
8. Hafeez, M. (2021). Teaching-learning process and ict tools-a review. *Indonesian Journal of Basic Education*, 4(1), 18-27.
9. Jadhav, V. R., & Bagul, T. D. (2021, February). Education Towards Skill Development For Rural Women. In *Chronicle of Humanities and Cultural Studies, UGC Sponsored National Conference, Mahatma Gandhi, Education and welfare Society* (Vol. 7, No. 01, pp. 122-126).
10. Jadhav, V. R., Bagul, T. D., & Baste, Y. R. (2020). Innovative Reforms in Lockdown Period in Teaching and Learning in Higher Education during COVID-19 Era. *Economic, Social, Psychological, Political, Educational and Literary Impact of COVID-19*.
11. John, P. D., & Sutherland, R. (2004). Teaching and learning with ICT: New technology, new pedagogy?. *Education, Communication & Information*, 4(1), 101-107.
12. Millea, J., Green, I. & Putland, G. (education.au). (2005). Emerging technologies: A framework for thinking. Canberra: ACT Department of Education and Training. Retrieved 20 December 2005 from:
13. Tedla, B. A. (2012). Understanding the importance, impacts and barriers of ICT on teaching and learning in East African countries. *International Journal for e-Learning Security (IJeLS)*, 2(3/4), 199-207.