Strategic Role of Information and Communication Technology in Enhancing Learning: Performance and Perspectives

Dr. Inderpreet Kaur
Principal
University Institute of Teachers Training and Research
Chandigarh University, Gharuan

Abstract
Teaching and learning are like an identical representation of each other. Often,the most acknowledged standards for estimating good teaching is the measure of student learning. ICT is changing process of teaching and learning by adding elements of vitality to learning.. New technologies make it possible for complicated collaborative activities of teaching and learning by dividing it in space and time, with seamless connectivity between them which facilitates both the teachers and the taught .It is very important to develop educational skills that are compatible and to enable teachers to deliver these policies Training and development should be available to all for better understanding of the past ,present and future for better learning..This paper is an attempt to study the education in the context of information and communication technology for better learning keeping in view the present and future educational performance and perspectives.

Keywords: *Education, Information and Communication Technology, digitally literate.*

Introduction
Information and communications technology (ICT) is an important part of most organizations these days (Zhang & Aikman, 2007). The importance of Information technology in society as well as in the future of education, identifying the possible challenges to integrating these technologies would be an important step in improving the quality of teaching and learning Teaching is a broader concept for qualitative learning. It has many domains which equips the teacher with the tools of teaching resulting in creative outputs in terms of responsible and learned students.

Education
Education is undoubtedly the key platform for picking up and developing skills and enhancing the productive capacities of a person. Knowledge acquired through education is fast becoming the basic resource for the development of every society.'Education' is utilized in three senses: Knowledge, Subject and a Process. When a person achieves degree up to certain level we do not call it education .As for example if a person has secured Masters degree then we utilize education it a very narrower sense and call that the person has achieved education up to Masters Level. In the second sense, education is utilized in a sense of discipline. As for example if a person had taken education as a paper or as a discipline during his study in any institution then we utilize education as a subject. In the third sense, education is utilized as a process. In fact when we talk of education, we talk in the third sense i.e. education as a process. Thus, we talk what is education as a process?

Rig-Veda says ,Education is something, which makes a man self-reliant and self-less.
According to Pestalozzi, Education is the harmonious and progressive development of all the innate powers and faculties of man- physical, intellectual and moral.
T.P.Nunn has the opinion that Education is the complete development of the individuality of the child so that he can make an original contribution to human life according to the best of his capacity.

In India, the National Policy on Education 1986 (as modified in 1992) stressed upon employing educational technology to improve the quality of education. The significant role of ICT in school education has been highlighted in the National Curriculum Framework (NCF) 2005. It advocated for exploration of possibilities of teaching and learning at varied paces, self-learning, dual modes of study, etc.,with the help of technology. The emphasis on teacher-centered, lecture-based instructions is apparently changing to student-centered interactive learning environments. Technology has condensed time and space, making it possible for student and teachers to engage in academic, economic, and social activities across the globe in realtime. The wheels of change are certainly in motion and technology is driving a shift in the way institutions deliver educational services and facilitate learning. Thus ICT is influencing what is being taught and what is learnt.

Objectives of the Study

1. To trace the strategic role of information and communication technology in teaching learning process.
2. To identify the areas of professional development in terms of information and communication technology in teaching learning process
3. To discuss the innovative information and communication strategies for performance based learning.

Review of Literature

National Curriculum Framework – Teacher Education (2010) NCTE designed the National Curriculum Framework for Teacher Education (NCFTE). The NCFTE (2010) says "A teacher needs to be prepared in relation to the needs and demands arising in the school context, to engage with questions of school knowledge, the learner and the learning process.. This view of education points to the need to take a fresh look at teacher preparation. Education is not a mechanical activity of information transmission and teachers are not information dispensers. Teachers need to be looked at as crucial mediating agents through whom curriculum is transacted and knowledge is co-constructed along with learners.
Central Advisory Board of Education (CABE) Sub-committee Report on ICT in School Education (2012) focuses to develop essential capacities of teachers to utilize ICT resources. Teachers need to be trained in a variety of applications of ICT ,enabling them to integrate ICT in teaching-learning, develop and use educational resources, participate in collaborative activities and develop their capacities. Such trainings should be regularly and repeatedly organized.
Teacher Education in the 12th Plan –Guidelines Teacher Education in the 12th Plan –Guidelines criticise the current teacher education models as rigid curriculum, inadequate support for constructivist approaches, no continuity of professional interactions in teacher education

institutions or peers and limited assessment of teacher education program.
Angel Rathnabai, S. (2014)found that ICT Infused Instruction design in teaching of mathematics is effective in developing pre-service teachers‟ knowledge on ICT, confidence in using ICT, attitude towards ICT, ICT skills and techno pedagogical competency in teaching mathematics when compared to other two treatments namely integrated and complementary model

Strategic role of Information and Communication technology in teaching learning process

ICT permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure. At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).As Jhurree (2005) states, much has been said and reported about the impact of technology, especially computers, in education. Initially computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Conventional teaching has emphasized content. For many years course have been written around textbooks.But now change is required for the betterment of the students.

Contemporary settings are now favoring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and to be concerned more with how the information will be used than with what the information is. Contemporary ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance-based curricula that make sound use of the affordances of these technologies (Oliver, 2000).

Jones and Fox (2009) in „The Pew Report‟ characterizes the new generation of learners as digital natives. However teachers are often seen as digital disconnects, that is, professionals who resist the inclusion of technology for learning and teaching. Students have the expectation from teachers as they are expected to lead them in acquiring the 21st century skills. There is a profound gap between the knowledge and skills most teachers have and what is required in today‟s world and ICT infused in workplaces which is an essential element of growth . ICT has become so pervasive in daily lives but still there are many teachers who are not comfortable with the use of technology. Teachers are still bound with the 20th century skills where they need to address the 21st century learners.

Professional Development in terms of information and communication technology in teaching learning process

Teachers are the pivot of teaching learning process. New development in ICT has had a huge impact on the role of teachers in information intensive society. Many teachers lack the knowledge and skills to effectively use ICT as a tool in facilitating learning and in increasing ICT

– pervasive learning environments.

For pedagogy ICT integration, changes may be introduced in both teaching learning methods and in content. A comprehensive study,Teachers and Technology: (Sandholtz, 2001).Making the connection" throws the light on the fact that lack of teacher preparation as a major obstacle to the effective use of technology in classrooms. Indian teachers identified the lack of professional development as a major stumbling block to effective educational use of ICTs and expressed the view that the lack of funds available made hardware acquisition a higher priority than professional development.

Teacher professional development should have five foci: skills with particular applications; integration into existing curricula; curricular changes related to the use of IT (including changes in instructional design); changes in teacher role and underpinning educational theories .These should be addressed in pre-service teacher training and built on and enhanced during in-service for qualitative change as per the changing scenario.

Steketee (2005) classified ICT integration under four approaches

- ICT skills development approach: it refers to inclusion of a core computer education unit in to the teacher education programmes
- ICT pedagogy approach: The focus of this approach is integrating ICT skills in respective subjects, drawing on the principle of constructivism, pre-service teachers design lessons and activities that cater to the use of ICT tools that will foster the attainment of learning outcomes.
- Subject- specified approach: By this method teachers not only expose students to new and innovative ways of learning, but also provide them with a practical understanding of what learning and teaching with ICT looks and feels like.
- Practice-driven approach: Here the emphasis is on exposure to use ICT in real aspects of teaching. Emphasizing on developing lessons, assignments etc. using ICT and implementing these in their practical work experience at various levels.

Innovative Information and Communication strategies for performance based learning

1. Online Learning: The scope of online learning in education is quite wide, ranging from student Digital professional development resources: Platforms such as TeachScape and KDS are personalizing development by providing relevant digital courses to teachers
2. Digital and adaptive content: By its very nature, elemental digital instructional materials are easily adaptive. A trivial example of an adaptive digital resource is a problem set created by the teacher with a word-processing program
3. Tablets*:* Tablets are small personal computers with a touch screen, allowing input without a keyboard or mouse. The most effective apps develop higher order thinking skills and provide creative and individualized options for students to express their understandings.
4. Interactive White Boards or Smart Boards: Interactive white boards allow projected computer images to be displayed, manipulated, dragged, clicked, or copied
5. E-readers*:* E-readers are electronic devices that can hold hundreds of books in digital form, and they are increasingly utilized in the delivery of reading material
6. Flipped Classrooms*:* The flipped classroom model, involving lecture and practice at home via computer-guided instruction and interactive learning activities in class, can allow for an

expanded curriculum.

7. Students with different styles of learning: ICT can provide diverse options for taking in and processing information, making sense of ideas, and expressing learning. Over 87% of students learn best through visual and tactile modalities, and ICT can help these students 'experience' the information instead of just reading and hearing it
8. M-learning is a new tool in the pedagogical arsenal to support students and teachers to navigate the options available in the expanding world of distance learning. M-learning is learning accomplished with the use of small and portable computing devices. M-learners typically view content and lessons in small and manageable formats that can be utilized when laptop or fixed station computers are unavailabl

Advantages for Teaching Learning Process

I. The learners get the fully detailed idea about the particular topic by the use ICT Tools like CD/DVD , computers , blogs , multimedia , search engines , audio/ video conferencing and social media.
II. There are websites of the education boards like , GSEB , CBSE , ICSB that provide with the latest updates for the teachers and give other information helpful to them about new policies , rules and regulations along with the reference materials.
III. The website like slideshare and YouTube offer the multimedia platform to receive and give the information. The followers, viewers and commentators prove to be the critic and show the worth of your creation.
IV. The blogs seem to be the digital diaries for expressing your views , thoughts and creations .They can do the peer commenting and everyone is able to access the writings and work just by clicking on their friends on batch – mates .
V. Even the experts 'views and research work can be used for online resources. This gives the fundamental information in all the subjects like mathematics, science and even art & craft.

Digital Literacy

"Digital literacy is literacy via technology." However things are not that simple. Literacy is not only the ability to read and write, but rather the ability to put these skills to work in shaping the course of one's own life. This adds to the complexity since technology is continuously changing the environment we live in. Every educator must understand that digital literacy is essential if we want our citizens to participate in today's modern world.

Digital Competence is both a requirement and a right of citizens, if they are to be functional in today's society .Today's generation appears to engage with all things that are digital without any effort at all. Young people are born into an interactive, on demand digital culture where they are used to texting, video streaming, mobile Internet and social networking to mention just a few.

So educators introduced the concept of visual literacy, highlighting the importance of how to look at images, and understand the way images communicate and carry meaning. The emergence of databases introduced a new wave of powerful technologies to shape shape literacy. These technologies needed a new set of skills, competences and strategies for searching, finding

and evaluating information - creating information literacy. Media literacy followed shortly with hundreds of TV channels to choose from. The microprocessor on our desks created the need for an ICT literate generation and an entirely new set of technical skills to maximise the potential of the technology.

We are not just preparing students for today with this new meaning of literacy in mind but also for the future with a shift from consumption to production. The Internet, the World Wide Web, smartphones, Facebook are very recent terms when compared to what has been going on in schools of digital literacy.

It is erroneous to associate digital literacy with basic computer skills. Such association would be akin to saying that literacy is merely the ability to read and write which is of course a part of literacy but our understanding of literacy is much more. It is about the understanding of meaning and the conveyance of meaning rather than simply reading and writing skill on their own. The emergence of Web 2.0 technologies must be reflected in the definition where the distinction between consumer and producer virtually disappears. This development is addressed in Futurelab's definition who have a subtle and situated understanding of digital literacy. It is largely about understanding and conveying meaning just like literacy but this time mediated through a digital domain.

"Digital literacy refers to the more subtle and situated practices associated with being able to create, understand and communicate meaning and knowledge in a world in which these processes are increasingly mediated via digital technologies." (Futurelab, 2010)

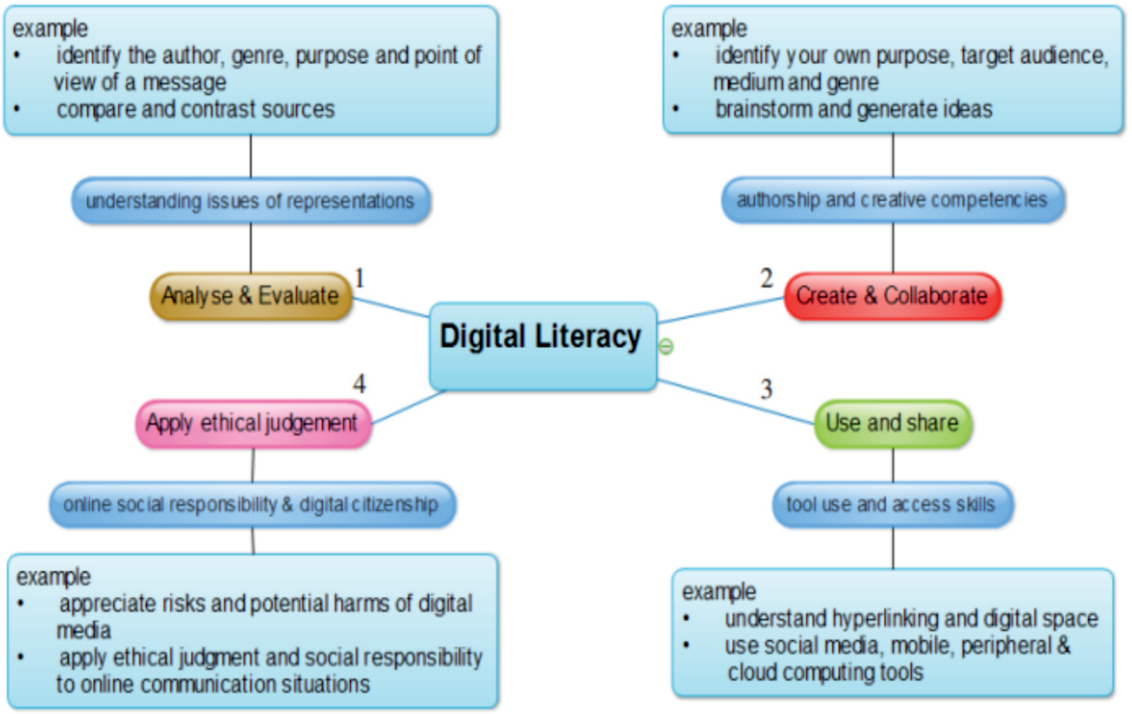

Figure 3 Adapted from Hobbs (2010)

1. Analyze and evaluate; (understanding issues of representations) Analyze messages in a variety of forms by identifying the author, purpose and point of view, and evaluating the quality and credibility of the content
2. Create and collaborate; (authorship and creative competences) Take social action by working individually and collaboratively to share knowledge and solve problems in the family, workplace and community, and by participating as a member of a community
3. Use and share; (tool use and access skills) Create content in a variety of forms, making use of language, images, sound, and new digital tools and technologies
4. Apply ethical judgment; (online social responsibility & digital citizenship) Make responsible choices and access information by locating and sharing materials and comprehending information and ideas. Reflect on one's own conduct and communication behavior by applying social responsibility and ethical principles

Conclusion

Technology can impact education in deep form, in particular, it can contribute to rethinking pedagogical skills like collaboration, argumentation, experimentation, collection of data, presentation of results, etc., can be facilitated by ICT tools. ICT tools keep a challenging critical pressure on teachers' roles as educators and teachers' skillset. The role of the teacher is ever more important in selecting the most adequate technological tools for the specific students . When teachers pose questions and they do not know the outcomes it's an uncomfortable place for teachers. When teachers start to embrace an approach where the students discover their learning, teaching finally becomes more a process about guiding as opposed to leading the process. We need to commit ourselves to change education at classroom level. Just imagine how many children will be impacted over a number of years by just one teacher at a time who makes the shift to 21st century learning. Training and continuous support will help teachers to move from the shallow end of enhancement to venture out of the comfort zone into the deep part of transformation. We need to look at what teaching how to learn and assessment will look like in a 21st century learning environment which in a few words must be relevant, creative and a real world experience.

References

[1] Al-Ansari, H. (2006) Internet use by the faculty members of Kuwait University. The Electronic Library Vol.24, No. (6), Pp; 791-803.

[2] Angel Rathnabai, S.(2014) Effectiveness of ICT Infused Instructional Design IIID in methodology of teaching mathematics at secondary level.Ph.D Thesis in Education, University of Mysore,Mysore.

[3] Davis, N.E., & Tearle, P. (Eds.). (1999) A core curriculum for telematics in teacher training. Available:www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm.

[4] Ferrari, A. (2012) Digital Competence in Practice: An Analysis of Frameworks. A Technical Report by the Joint Research Centre of the European Commission.

[5] Futurelab,(2010) http://www2.futurelab.org.uk/resources/documents/handbooks/digital_literacy.pdf

[6] Hobbs, R. (2010) Digital and Media Literacy: A plan of Action, 2010.
[7] Jhurreev, V. (2005) "Technology Integration in Education in Developing Countries: Guidelines to Policy Makers". International Education Journal [Electronic], 6(4):467-483.Available:http://ehlt.flinders.edu.au/education/iej/articles/v6n4/jhurree/paper.pdf
[8] Jones, S & Fox, S. (2009). Generations Online in 2009. Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/Reports/2009/Generations-Online-in2009.aspx
[9] Lanham, R. (1995) Digital literacy, Scientifi c American, 273(3), 160–161.
[10] Lemke,C.& Coughlin, E.C. (1998) Technology in American schools. Available: www.mff.org/pnbs/ME158.pdf
[11] Mishra, Pawan Kumar (2008) Constitutional contours of right to education and education system in India .Ph.D Thesis in Departmnet of Law, University of North Bengal, West Bengal.
[12] National Council of Educational Research and Training. (2005). National Curriculum Framework 2005. New Delhi: NCERT.
[13] National Council of Educational Research and Training. (2005). National Curriculum Framework 2005. New Delhi: NCERT
[14] Oliver, R. (2000) Creating Meaningful Contexts for Learning in Web-based Settings. Proceedings of Open Learning 2000. (Pp; 53-62).Brisbane: Learning Network, Queensland.
[15] Özden, M. (2007) Problems with science and technology education in Turkey. Eurasia Journal of Mathematics, Science & Technology Education, 3(2), 157-161.
[16] Pelgrum, W. J. (2001) Obstacles to the integration of ICT in education: results from a worldwide educational assessment. Computers & Education, 37, 163-178.
[17] Plomp, T.; Pelgrum, W. J. & Law, N. (2007) 'SITES2006—International comparative survey of pedagogical practices and ICT in education', Education and Information Technologies Vol.12, No. (2), Pp; 83- 92.
[18] Poore, M. (2012) Digital literacy: Human flourishing and collective intelligence in a knowledge society. Literacy Learning: The Middle Years, 19, (2), 20-26.
[19] Steketee, C. (2005). Integrating ICT as an integral teaching and learning tool into pre-service teacher training courses. Issues in Educational Research, 15(10), 101-112
[20] Yusuf, M.O. (2005) Information and communication education: Analyzing the Nigerian national policy for information technology. International Education Journal Vol. 6 No. (3), Pp; 316-321.
[21] Zhang, P., & Aikman, S. (2007). Attitudes in ICT Acceptance and use. In J. Jacko (Ed.), Human computer Interaction, Part 1 (pp. 1021-1030). Syracuse, NY: Springer-Verlag Berlin Heidelberg.