ICT IN EDUCATION: HERALD OF A NEW WAVE

Shahina Intekhab

"Sulaiman House", Chhoti Quazipura, P. O. Lal Bagh, Darbhanga – 846004 (Bihar).

Abstract

The world is moving around the utilization of ICT in every sphere of life and it has increasingly become an essential element of the educational environment. Information and communication technologies (ICTs) are important tools for bringing education throughout the world. ICT plays a very important role throughout the world in every phase of human activity. It has been an essential requirement in educational institutions for learning and teaching in the present day of the digital environment. This emerging technology not only has a key role in education and training but has also enhanced the scope for sharing knowledge all over the globe. ICT has given education a whole new meaning as this evolving technology has already challenged stereotyped and conventional ways of the educational system. The learners are using, accessing, capturing video lectures, digital notes via electronic gadgets and researchers, teachers uploading their articles, videos, class lectures through ICT tools and techniques. ICT can also make available powerful support for educational innovations. All over the world, there is a tendency to use ICT in teaching-learning practice. When used properly, several ICTs are said to help increase access to education, make stronger the application of education to the increasingly digital workplace, nurture educational quality, helping make teaching and learning into an attractive and dynamic process linked to real life. In this digital age, the use of ICT in the classroom is very important for giving opportunities to students to learn and apply the required 21st century skills. ICT improves teaching and learning and its importance for teachers in performing their role as creators of pedagogical environments. ICT helps a teacher to present his teaching attractively and able to learn for the learners at any level of educational programs.

Keywords: *ICT, Education, Teaching, Learning, Pedagogy, Environment and Tools.*

Introduction

The emergence of Information and Communication Technology (ICT) and their application in various fields of human life have caused ICT has to become the buzz word of the present day. ICT has already proved its relevance in education, research and other sectors of the economy and this, in turn, has improved the quality of human life. The combination of education and technology has been believed the prime key to human progress. Education feeds technology, which consecutively forms the base of education. It is therefore evident that ICT affected change to the methods, purpose and perceived potential of education. It has ruled over different facets of our lives and influenced the way we live. It is undoubtedly revolutionized the field of education. ICT in education has been gaining popularity beyond

mere mentioning; its acceptability yielded a variety of recognition and made it one of the most important icons of the 21st century that attract the attention of scholars.

Effective use of technology can encourage students, make our classes further dynamic and attracting and restore teacher interest as they learn new skills and techniques. Technology is also facilitating the students to know any abstract concepts undoubtedly. ICT has to turn out to be an important part of today's teaching-learning process. The addition of ICTs in teaching over-all and teacher education, in particular, is the need of the day. The use of ICTs can make significant modifications for teaching and training mostly in two ways: firstly, the rich representation of information changes learner's awareness and perception of the context. Secondly, the vast distribution and easy process of access to information can change relationships between teachers and students. It adds up a dimension to learning that did not earlier exist in the education system. ICT has also completely transformed the education scenario in the teaching-learning process. The process today has become more interesting and creative for the students who can learn their lessons in a more collaborative and interactive environment. Information and communication technology provides unlimited resources for students.

It is in general viewed that ICT can empower both teachers and learners. The use of ICTs in the educational system would not be capable to resolve the existing problems in the educational system, but rather provide alternative solutions to the obstacles encountered in the conventional educational system. ICTs would be capable to offer education and knowledge in a broader reach, even with a limited amount of resources, unlike conservative methods of education. Use of a diverse set of ICT tools: to communicate, create, disseminate, store, and manage information for the enhancement of quality education. In some circumstances, ICT turns out to be an integral part of the teaching-learning interaction, through such methodologies as substituting chalkboards with communicating digital whiteboards, using students' own smart phones or further tools for learning during class time. These technologies consist of computers, the internet, broadcasting technologies and telephony etc. It refers to a range of technologies including computers, computer workstations, display facilities, hardware, software, recording and processing system for sound, still and moving pictures, graphic calculators and a wide range of communication facilities present in the world. It has been established as a potential and powerful tool for educational change and reform to cope with the globalized world. Right and proper use of

different ICTs is said to help expand access to education, build up the relevance of education to the increasingly digital workplace and increase educational quality by and so on helping make teaching and learning into an engaging, active process linked to real life. While teachers are digitally knowledgeable and trained to utilize ICT, these approaches can start to higher-order thinking skills, offer innovative and customized options for students to state their understandings and leave students better practiced to deal with current technological changes in society. Information Communication Technology (ICT) heralds the world of knowledge on the screen hence the learners' learning will be enhanced in a split second meeting the demands of the society at large.

Universal research has shown that ICT can lead to improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan confirmed that enhance in the use of ICT in education with incorporating technology into the curriculum has an important and constructive effect on students' achievements. The effects surely showed that the students who are continuously exposed to technology through education have advance know-how, presentation abilities, advanced competencies and are ready to take further make an attempt into learning as compared to their counterparts.

In our country, the education system is also not an exception and it is witnessed a series of changes that have brought an increase in the market size of the education industry in India. The government has taken various initiatives for the development of education infrastructure which consists of the development and implementation of ICT applications and it has been recognized as a vehicle for citizenry's transformation from a production-based economy to a knowledge-based economy. The government also started initiatives to develop criteria and implementation of ICT policies facilitated in making stronger India's position in the software-driven ICT sector in the world. One of the many challenges facing emerging nations today is set up their societies and governments for globalization and the information and communication revolution.

According to UNESCO, "*Measuring ICT in education is therefore important to inform policy makers in setting national priorities and developing ICT in education policy.*"

Uses of ICT in Education

The applications of ICT in education have increasingly come to be an essential part of' modern culture increasing all over the world through traditional and vocational education. In all levels of education, ICT can be utilized for a better teaching-learning process and

improving the quality of the education system as a whole. Incorporating ICT into the education system can increase the quality of education.

The use of information and communication technology in the educational system is taken very seriously by governments around the world. As educational systems attempt regarding the mainstream use of ICT in teaching and learning there perform to be more critical steps and main components needed for the successful infusion of ICT into educational environments.

ICT can be used as a promising tool in the development of education in the following ways:

- **Informative tool**: It provides a 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 are 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).

Types of ICTs which are commonly used in Education are as under:

1. E-Learning (Electronic Learning): It is a general term used to transfer to computer enhanced learning. It is generally related to the field of advanced learning technology (ALT), which deals with both the technologies and allied methods in learning using network and multimedia technologies. It is also known as online learning. Distance education provided the source for e-learning's development. It overcomes timing, attendance and travel difficulties. It is possible to pull the online environment to make easy teaching techniques like role-playing across time and distance. It can also facilitate the development of scenarios, which can be rarely witnessed in practice. ICT can play a significant role to monitor and log the development of the students across time, place and various activities. The web and the internet are the core ICTs to spread education through e-learning. The components comprise e-portfolios, cyber infrastructures, digital libraries and online learning object sources. All the above components make a digital identity of the student and connect all the stakeholders in the education.

E-learning has the following advantages:

- Eliminating the time and geographical barriers in education for learners as well as teach teachers.

- Enhanced group collaboration made possible via ICT.

- New educational approaches can be used.

- It can provide speedy dissemination of education to target disadvantaged groups.

- It offers a combination of education while balancing family and work life.

- It enhances the international dimension of educational services.

E-learning is mostly used in higher education and corporate training. It encompasses learning at all levels, both formal and non-formal. It uses information networks like the internet, intranet (LAN) and extranet (WAN) for course delivery, interaction, evaluation and facilitation. Web-based learning is a subsection of e-learning and brings up learning using the Internet mainly using a browser.

2. Blended Learning: It is the combination of various methods of learning and utilized to classify a circumstance where various distribution systems are distributed together to deliver a specific course. These approaches may include a combination of face-to-face learning, self-paced learning and online classrooms. It makes the physical participation of both teacher and student, in certain parts of student control over time, place, path, or pace. Such as students in a usual class can be assigned both print-based and online resources have online teaching sessions with their teacher through chat and are subscribed to a class email list. Web-based training courses can be developed by regular face-to-face instruction. Instead, importance must be given to the subject matter, the learning objectives and results, the appearances of the learners and the learning environment in order to arrive at the best mix of instructional and delivery methods.

3. Distance Learning: It is a kind of education, where students work on their own at home or at the place of work and share with faculty and another student via e-mail, electronic discussions, videoconferencing, chat rooms, direct messaging and other forms of computer-based communication. It is also acknowledged as open learning. Maximum distance learning programs consist of a computer-based training (CBT) system and communications devices to produce a vital classroom. Such as the Internet and World Wide Web are manageable from almost all computer platforms, they make as the ground work for different distance learning systems.

ICTs additionally take into account the creation of advanced resources like digital libraries where the students, teachers and experts can retrieve research and course material from any place at any time. Such services make available the interaction of academics and researchers

and hence the sharing of scholarly material and lead to quality improvement in teaching and learning.

The Promise of ICTs in Education

For emerging nations, ICTs have the possibility for an increasing approach to and improving the application and quality of education. It characterizes a theoretically make equal policy for emerging nations.

According to the World Bank development report, 1998/99 Quoted in Blurton, C. *[ICTs] greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others who live in the poorest countries, is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago.*

On the other hand, the realism of the Digital Divide the gap between those who have access to and control of technology and those who do not means that the introduction and combination of ICTs at another level and in several types of education will be a challenging task. Flop to meet the challenge would mean a foster widening of the knowledge gap and the development of prevailing economic and social inequalities.

1. ICTs can Expand Access to Education

ICT is a possibly effective tool for increasing educational prospects, jointly with formal and non-formal, to before underserved constituencies spread out and rural populations, groups by tradition excluded from education due to cultural or social reasons, for example ethnic minorities, girls and women, persons with infirmities, and the senior along with all others who for reasons of cost or because of time restrictions are unable to enroll on campus. But the emergence and application of ICT have changed the scenario.

- **Anytime, anywhere:** ICTs promote learning anytime, anywhere. One defining feature of ICTs is its ability to transcend time and space. ICTs make possible a synchronous learning or learning categorized by an interval between the transmission of instruction and its gathering by learners. Furthermore, particular forms of ICTs, such as teleconferencing technologies make possible instruction to be received at the same time by multiple, geographically dispersed learners (i.e., synchronous learning).

- **ICTs Help in Accessing Remote Learning Resources:** Teachers and students no longer have to trust totally on printed books and additional sources in physical media housed in libraries (accessible in limited numbers) for their educational needs. With the Internet and the World Wide Web, the prosperity of learning materials in more or less each subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unrestricted number of people.

2. ICTs Prepare Individuals for the Workplace

ICTs enhance the students learning and prepare them to adjust their job places. One of the greatest usually cited reasons for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, mainly computers, the Internet and related technologies, are fetching more and more ubiquitous. Technological literacy, or the skill to use ICTs excellently and proficiently, is thus seen as representing a modest edge in a progressively globalizing job market. Technological literacy still is not the only skill well-paying job in the new worldwide economy.

Table 1. Skills Needed in the Workplace of the Future

Digital Age Literacy	
Functional literacy	Ability to decipher meaning and express ideas in a range of media; this includes the use of images, graphics, video, charts and graphs or visual literacy
Scientific literacy	Understanding of both the theoretical and applied aspects of science and mathematics
Technological literacy	Competence in the use of information and communication technologies
Information literacy	Ability to find, evaluate and make appropriate use of information including via the use of ICTs
Cultural literacy	Appreciation of the diversity of cultures
Global awareness	Understanding of how nations, corporations and communities all over the world are interrelated

Inventive Thinking	
Adaptability	Ability to adapt and manage in a complex , interdependent world
Curiosity	Desire to know
Creativity	Ability to use imagination to create new things
Risk-taking	Ability to take risks

| High Order Thinking | Creative problem-solving and logical thinking that result in sound judgments |

Effective Communication	
Teaming	Ability to work in a team
Collaboration and interpersonal skills	Ability to interact smoothly and work effectively with others
Personal and social responsibility	Be accountable for the way they use ICTs and to learn to use ICTs for the public good
Interactive communication	Competence in conveying, transmitting, accessing and understanding information
High Productivity	Ability to prioritize, plan, and manage programs and projects to achieve the desired results. Ability to apply what they learn in the classroom to real-life contexts to create relevant, high –quality products.

Source: Adapted from enGauge. North Central Regional Educational Laboratory and the Metiri Group**.** Available at https://www.researchgate.net/publication/234731444
&
Tinio, Victoria L. ICT in Education.
Available at https://wikieducator.org/images/f/ff/Eprimer-edu_ICT_in_Education.pdf

ICTs Improve the Quality of Education

Improving the quality of education and training is a serious issue, mostly in an era of educational expansion. ICTs can improve the quality of education in different ways; by boosting learner motivation and dedication, by making simple the acquisition of basic skills, and by improving teacher training. ICTs also carry out as a transformational tool in education that when used properly can promote the shift to a learner-centered environment. ICTs for example videos, television and multimedia computer software that combine text, sound and colorful moving images can be used to present interesting and realistic content that will involve the student in the learning process and also provide the opportunity to connect with real people and to contribute in practical events.

The use of ICT can also improve performance, teaching, administration and develop relevant skills in underprivileged communities. It also gets improved the quality of education by making simpler learning by work out, real-time discussion, delayed time conversation, directed instruction, self-learning, problem-solving, information getting and analysis and critical thinking along with the ability to communicate, collaborate and learn.

- **Motivating to Learn**

Information and Communication Technologies (ICTs) can be videos, television supplemented

by multimedia computer software that mixes text, sound also colourful moving images that can be used to enhance a challenging and actual subject material that will interest the student in the learning process. Communicating radio also builds usage of sound effects, songs, dramatizations, comic skits, and advance carrying out practices to force the students to listen and become participating in the lessons actuality delivered. Further so than any other type of ICT, networked computers with an internet connection can make the learner more motivate to his\her learning. One kind of ICT merges the media richness and communicating with other ICT with the opportunity to link with real people and to participate in real-life happenings.

- **Facilitating the Acquisition of Basic Skills**

The broadcast of fundamental skills and concepts that are the foundation of higher-order thinking skills and creativeness can be made easy by Information and Communication Technologies (ICTs) through drill and practice. Educational television programs such as Sesame Street use repetition and emphasis to teach the alphabet, numbers, colors, shapes and additional elementary concepts. A significant amount of the initial practices of computers were for computer-based learning (also called computer-assisted instruction) that paying attention to the mastery of skills and content through repetition and reinforcement.

The broadcast of basic skills and thoughts that are the foundations of higher-order thinking skills and inspiration can be simplified by ICTs via drill and practice. It has been also utilized to make better access to and the quality of teacher training. For example: In 1996 satellite-based one-way video-and two-way audio-conferencing was held in Indira Gandhi National Open University, fill out by print-materials and recorded video to train 910 primary school teachers and implementers from 20 district training institutes in Karnataka. The teachers interacted through remote lecturers by telephone and fax. It furthermore offers opportunities to learners to meet in a virtual space with other users, members, and practitioner experts to discuss issues, answer questions and even participate in simulations as well as management games without having to set aside their office or home.

- **Enhancing Teacher Training**

Information and Communication Technologies (ICTs) have also been used to enhance access to and the quality of teachers' training. It makes available the latest information and ideas to teachers to make their teaching more interesting. Merging ICT in teaching and learning is imperative on the educational reform agenda. Often ICT is seen as an essential tool to fully take part in the knowledge society. It is assumed that ICT brings a revolutionary change in

teaching methodologies. The role of technology in teaching and learning is fast growing one of the burning and broadly debated issues in current education policy if ICT is properly used. It holds immense assurance to improve teaching and learning in addition to determining workforce opportunities.

3. ICTs Transform Learning Environment into Learner-Centered

Research has indicated that the proper utilization of ICTs can catalyze the particular shift in both subject matter and instructional method that is at the heart of education development in the 21st century. If ICTs supported education designed and implemented properly, it can promote the acquisition of the knowledge and skills that will give power to students for lifelong learning. These highly developed challenges of teaching and learning are projected by constructivist theories of learning and change over a shift from a teacher-centered pedagogy to one such as learner-centered. While utilized appropriately, ICTs mostly computers and Internet technologies make simple better approaches to teaching and learning rather than basically allow teachers and students to do what they have done before in an advanced way.

There are various advantages originated from the use of ICT tools in getting better quality ICT education, for example, the talent for the learner to choose when to learn notwithstanding geographical location deprived of stress. Secondly, ICT also empowers learners to find out and look into new ideas or inventions from experts around the global world through the use of the common ICT available facilities. Thirdly, the reality of ICT in the education system will enable the delivery of teachers to students, monitoring of learner development and evaluation can be done timely. Thus, learning is of the following types:

Table 2. Overview of Pedagogy in the Industrial versus the Information Society

Aspect	Less ('traditional pedagogy')	More ('emerging pedagogy' for the information society)
Active	- Activities prescribed by teacher - Whole class instruction - Little variation in activities - Pace determined by the programme	- Activities determined by learners - Small groups - Many different activities - Pace determined by learners
Collaborative	- Individual - Homogenous groups - Everyone for him/herself	- Working in teams - Heterogeneous groups - Supporting each others

Creative	• Reproductive learning • Apply known solutions to problems	• Productive learning • Find new solutions to problems
Integrative	• No link between theory and practice • Separate subjects • Discipline-based • Individual teachers	• integrating theory and practice • Relations between subjects • Thematic • Teams of teachers
Evaluative	• Teacher-directed • Summative	• Student-directed • Diagnostic

Source: Voogt, J. (2008). IT and Curriculum Processes: Dilemmas and Challenges. International Handbook of Information Technology in Primary and Secondary Education. Available at https://teachwithict.files.wordpress.com/2011/08/dede.pdf

&

Tinio, Victoria L. ICT in Education. Available at https://wikieducator.org/images/f/ff/Eprimer-edu_ICT_in_Education.pdf

Active Learning

The usage of ICTs puts forward a stand for the student to question, investigate and construct of the latest information in the process of teaching and learning. The students, therefore, learn as they do and, when appropriate work on actual life problems in-depth. Moreover ICT makes learning less abstract and more relevant to their life situations.

- **Collaborative Learning**

The use of ICTs creates collaboration, relations together with students and teachers notwithstanding where they are. This limitation of traditional pedagogy has been overcome by the use of it. In addition to modeling real-world connections, ICT maintained learning makes accessible learners the opportunity to work with people from different cultures, in that way helping to develop learners' teaming and communicative skills other than their worldwide awareness.

- **Creative Learning**

The use of information and communication technologies supports the operation of existing information and the formation of real-world products instead of the regulation of received information, which is not the same as reproductive learning use up in the traditional pedagogy style of teaching.

- **Integrative Learning**

ICTs improve learning through an integrative approach to teaching/learning. This technique removes the false separation between the different subjects and between concept and practice,

which characterizes the traditional pedagogy approach.

- **Evaluative Learning**

ICT-enhanced learning is student-directed and analytical. Nothing like traditional pedagogy, ICTs acknowledges a lot of different learning paths and different articulations of knowledge as said above that ICT does not emphasize only one type of teaching or learning method like traditional pedagogy. The pedagogy supported by ICTs permits learners to explore and discover rather than purely pay attention and keep in mind.

Conclusion

Educational reform includes the successful designing and implementation of ICT in the teaching-learning process, which is the key to success. There is a rapid shift of educational technologies and political force, so as to shape the structure of the system of education across the globe. Efforts must be made by the educationists to change the method of teaching-learning to prepare the students to adjust themselves to the society which is rich in information and technology. The purpose of ICT in education is to make the students and teachers familiar with its use and how it works. It is a known fact that ICT ushered a revolution within the classroom and the old paradigm of teacher-centered education imparted mainly through 'chalk and talk' is giving way to a learner-centered one that promotes technology-aided self-learning. ICT is becoming more appropriate in the realization and implementation of the emerging pedagogy of constructivism that gives greater responsibility for the learning of students. It will increase flexibility so that learners can access education regardless of time and geographical barriers. It would offer a rich environment and motivation for the teaching-learning process which seems to have a great impact on the development of learning in education by offering new prospects for learners and teachers.

ICTs have influenced educational practices to some extent and will increase considerably in the future. ICT will become a powerful mediator in transforming several educational practices. Effective application 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. ICT supported education will ultimately lead to the democratization of education.

References

Alexander, J. O. (1999). Collaborative Design, Constructivist Learning, Information

Technology Immersion, & Electronic Communities: A Case Study. *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century.*

Babu, G. Suresh., & M. A., K. Sridevi. (2018, May). Role of Information and Communication Technology (ICT) in Higher Education: A Study. *International Journal of Multidisciplinary Education and Research, 3*(3), 103-109.

Bransford, J. (Ed.). (1999). *How People Learn; Brain, Mind, Experience and School.* Washington, DC: National Research Council.

Desai, Swati. (2010, February 25 – 26). Role of Information Communication Technologies in Education. *Proceedings of the 4th National Conference; INDIA Com-2010.* Computing for Nation Development, Bharati Vidyapeeth's Institute of Computer Applications and Management, New Delhi, India.

Desh, Manoj Kumar. (2007). Integration of ICT in Teaching Learning: A Challenge. *EDU TRACKS, 6*(12).

Dhanwani, Supriya. (2013, February). Role of ICT in Education. *Scholarly Research Journal for Interdisciplinary Studies*. Special Issue-ACOE.

enGauge 21st Century Skills: Literacy in the Digital Age. *North Central Regional Educational Laboratory and the Metiri Group.*
Retrieved from https://www.researchgate.net/publication/234731444

Haddad, Wadi D., & Jurich, Sonia. (2002). ICT for Education: Potential and Potency. In Haddad, W. & Drexler, A. (Ed.). *Technologies for Education: Potentials, Parameters, and Prospects.* Washington DC: Academy for Educational Development and Paris: UNESCO, 34-37.

Kumar, Jitender., & Pasricha, Arti. (2014, Feb.). ICT in Education: Enhancing Teaching and Learning. *Scholarly Research Journal for Interdisciplinary Studies, II*(X), 935-946.

Kaur, Navdeep. (2015, March 14-15). Using ICT in Empowering Teachers for Quality Education. *International Journal of Scientific Research Engineering & Technology (IJSRET).* EATHD-2015, Conference Proceeding, 8-12.

Lim, C. P., & Chai, C. S. (2004). An activity-theoretical approach to research of ICT integration in Singapore schools: Orienting activities and learner autonomy. *Computers and Education, 43* (3), 215-236.

Mondal, Ajit., & Mete, Jayanta. (December, 2012). ICT in Higher Education: Opportunities and Challenges. *Bhatter College Journal of Multidisciplinary Studies, II*, 2-11.

Mehta, Deepa., & Kasnia, Suman. (2011, July). A Scenario on the Role of ICT in Governance and Education System. *IJCEM International Journal of Computational Engineering & Management, 13*, 100-109.

Munienge, Mbodila., & Muhandji, Kikunga. (2012, July). The use of ICT in Education: A Comparison of Traditional Pedagogy and Emerging Pedagogy Enabled by ICT's.
Retrieved from https://www.researchgate.net/publication/283509521

Moges, Birhanu. (2014, October). The Role of Information and Communication Technology (ICT) in Enhancing the Quality Education of Ethiopian Universities: A Review of Literature. *Journal of Education Research and Behavioral Sciences, 3*(8).

Murthy, Morla Raja Krishna., & Madhuri, S. Bindu. (2017, Sep. – Oct.). Role of Information and Communication Technology (ICT) on an Educational system for Quality of Education in Totality. *IOSR Journal of Research & Method in Education (IOSR-JRME), 7*(5), Ver. IV, 08-12.

Pathak, Kaushlendra., & Manoj, Nawal Kishor. (2018, January). ICT in Educational Institution: Need, Role and Importance. *IOSR Journal of Humanities and Social Science (IOSR-JHSS), 23*(1), Ver. 8, 42-46.

Saikia, Ruksana. (2017, March). Role of ICT in Higher Education. *International Journal of Academic Research and Development, 2*(2), 69-73.

Saxena, Namita. (2017, March). The Role and Impact of ICT in Improving the Quality of Education: An Overview. *International Journal of Engineering Sciences & Research Technology, 6*(3), 501-503.

Singh, Vikram. (2009). *Impact of Information and Communication Technology on Public Life.* University Science Press, New Delhi – 110002.

Suman. (2009). *Relative effectiveness of E Content Strategy and Conventional Strategy of Teaching Science* (Ph. D. Thesis, Department of Education, Maharshi Dayanand University, Rohtak). Retrieved from http://hdl.handle.net/10603/112463

The Commonwelath of Learning, "An Introduction to Open and Distance Learning". Retrieved from http://www.col.org/ODLIntro/introODL.htm

Thijs, A., Almekinders, M. P., Blijleven, P. J., Pelgrum, W. J., & Voogt, J. (2001). *Learning through the Web: A literature study on the potential uses of the Web for student learning*. Enschede: Universiteit Twente.

Thomas, Sunil Abraham. (2014). *Information and Communication Technology Enabled Education and Governance in the State of Kerala* (Ph. D. Thesis, Department of Economics, Mahatma Gandhi University, Kerala). Retrieved from http://hdl. Handle .net/ 10603/165403

Tinio, Victoria L. *ICT in Education*. Presented by UNDP for the benefit of participants to the World Summit on the Information Society. UNDP's regional project, the Asia-Pacific Development Information Program (APDIP), in association with the secretariat of the Association of Southeast Asian Nations (ASEAN). Retrieved from https://wikieducator.org/images/f/ff/Eprimer-edu_ICT_in_Education.pdf

Voogt, Joke. (2008). IT and Curriculum Processes: Dilemmas and Challenges. In Joke Voogt & Gerald Knezek (Ed.). *International Handbook of Information Technology in Primary and Secondary Education, 20*, Part One. Berlin, Springer. 117-132. Retrieved from https://teachwithict.files.wordpress.com/2011/08/dede.pdf

World Bank. (1998). The World Development Report 1998/99. Quoted in Blurton, C., New Directions of ICT-Use in Education

http://www.ignou.ac.in. See also Asian Development Bank (1997). *Distance Education for Primary School Teachers: Papers and Proceedings of the Regional Seminar on Distance Education* (Manila: Asian Development Bank).

https://en.wikibooks.org/wiki/ICT_in_Education/The_Promise_of_ICTs_in_Education

https://lifelearners.ng/the-role-of-ict-on-improving-the-quality-of-education/

http://scientificmind.com.np/importance-of-ict-in-education/

www.google.co.in