Role of Information Communication Technology (ICT) in Education and its Relative Impact

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***Abstract*- Present era is of technology and among the technology Information Communication Technology (ICT) is the most important. It is a power and playing critical and vital role in all aspect of human life. It has integrated the world and changed the entire global economic, social, political and educational scenario. Global overall growth and development largely depend upon skilled workforce which is possible through quality education. ICT is a product of education but was mostly used by the economic entities. It has fundamentally changed the practice and procedures of all forms of endeavours within business, society, governance and in education. It gradually transformed education from traditional to highbred and impacted teaching method, learning approaches, scientific research and accessing information. Therefore, in this paper researcher tried to examine the role, challenges and impact of ICTs, how it is facilitating student, teachers and end users and in addition he tried to explore the potential for future growth and development.**

Keywords*: *ICT, ICT tools, Virtual, Learner, Learning, Educator, Blended, E-Learning, Integrated Learning, Impact, Learning Outcome, Online, Face to Face, pedagogies

Jel Classification*: *A20, A21, A22, A23, A29, I20, I23, I25, I28, O38, O39

INTRODUCTION

Information Communication Technology (ICT) is a modified term of Information technology (IT). It is modern and dynamic in nature and provides access to information through telecommunication. From the past few decades it has provided society with vast array of communication capabilities and converted society into global village. It stresses the role of intelligent building management system through unified communications and integration of telecommunications, computers, internet, software's, middleware, storage, wireless network, mobile, instant messaging, audio, video conferencing, social networking (Facebook), voice over IP (VoIP) and other communication mediums. It is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. ICT effectively and efficiently manage information through diverse set of technological tools and resources and it is silently contributing in overall growth and development of the society. Globally ICT is been recognized as a catalyst of change and it has power to influence every aspect of the society. It changed work place, working conditions, business, entertainment, handling information, exchanging information's, education, teaching methods, learning approaches, scientific research and in accessing the information.

Role of Information Communication Technology (ICT) in Education:

Every nation has a responsibility to provide education to the children. It is their fundamental right. But it does not mean only the right to access education but right to receive quality education through quality teaching. Historically education was known as a socially oriented activity and a process of empowering society. But in the era of globalization it became socio – commercial activity which started empowering society distinctly by applying combination of traditional and modern approach. ICT in education simply means teaching and learning with ICT. It has become indispensable part of the education system. It has gradually transformed educational society into knowledge and information society which in result transforming economy to knowledge economy and supporting nations to create wealth by exploring knowledge. It is a modern and qualitative technological approach and has a deep impact on education system. It has introduced qualitative changes and increased productivity and changed the overall style and functioning of the educational system and its governance. It has contributed, contributing and will contribute immensely in the development of education.

It is also a universal fact that it cannot replace teachers as they are core part of quality teaching and technology cannot succeed without them. The only thing which can be changed, modified and upgraded is technology, way, method and mode of teaching. These innovative changes due to ICT forced all the educational participants to think futuristically and educational institutions, administration and teachers must adjudicate their roles, approach and vision accordingly. In technological world industry require manpower with techno managerial skills. To meet the expectation and to cater the demand knowledge economy requires educational institutions to produce graduate who have prerequisite IT and other competitive skills. Educational institutions have to convert their raw input students to techno management-oriented output. This is

possible only with adoption and integration of ICT with teaching and learning.

In global competitive era technology is the backbone of everything. By the adoption of Information and Computer Technology (ICT) education became much more effective than past. Researchers, academicians and industry professionals have proved that ICT provide opportunities to all educational participants to learn and excel. Across the world it is been accepted by the educational planners that increased exposure of students to educational ICT through curriculum integration has casted significant and highly productive impact on their achievement. Its exposure improved their knowledge, comprehension, practical skills, presentation skills and innovative capabilities to a great extent. It empowered and enhances the ability, adoptability, knowledge and surviving skills of students and of teachers. Its instructional use improved the progress and development of faculty and students alike. It optimized teacher's delivery of information and adds value to the processes of learning and the organization and management of learning institutions. It improved the student learning through self-paced learning and by accessing them to wide range of up to date learning materials. It is facilitating educational participant to acquire and absorb knowledge and increase academic productivity. It is helping nations to enhance educational system beyond classrooms and reaching out to all sect of society in common. It is playing outstanding role in formulating, improvising and executing polices in social, economic, political and educational sector and widening the range of opportunities for students, teachers, industry and poor.

In comparison to other sector impact of Information Communication Technology (ICT) in education is found below to par level. It is due to many explicit and implicit factors. Among the factors most obvious factors are insufficient funding for technological adoption and up gradation, lack of proper training to the teachers, lack of motivation, time constraint, trained manpower in teaching sector and lack of infrastructure in rural area. But due to growing competition in education sector and market demand it is showing progress and educational institutions are gradually adopting ICTs into classroom, learning setting, for developing efficiencies and flexibility in terms of delivery of information's and to provide support for customized educational programs to meet the need of individuals learners. Most of the institutions have adopted internet and www as an essential tool for information communications.

HISTORY OF TECHNOLOGY IN EDUCATION:

Technology is not a new thing it is evergreen phenomenon. Every civilization invented some technology according to the periodical requirement. Journey of technology in education started from oral communication, entered in written communication then passed through broadcasting and video age and now passing through computer age. Earliest means of teaching was oral and largely based on human memory and was the weakest form of education. Then human civilization invented writing in which they used figures to convey their message or tell their story. In the year 1436 Johannes Gutenberg builds a primitive version of the printing press and printed first Bible in the year 1455 and later after two centuries Stephen Dayne brought the first printing press in US and started printing books. During the period American settlers developed advance version of hornbook which was a small wooden paddle shaped instrument. It was one of the first forms of educational technology adopted in the education system later it became obsolete and text books became more common due to decline in cost. In the year 1690 the most popular printed book in school education was the New England primer, later followed by next generation written texts Webster's spelling book and McGuffey readers. In the year 1806, the Lancastrian methodology of schooling was introduced. In this methodology desktop sandbox was introduced in teaching and later replaced by new invention of the time that was individual slates which continued up to early 1800 century and replaced by classroom chalkboard in 1841. In the year 1870 Magic Lantern was invented which project images on glass plates. In the early 20th century lead pencils and papers became common and replaced school slate. During the same period Stereoscope got invented. These three-dimensional devices was used by the schools and colleges to show images. In the year 1889 Film Strip Projector, Kinetoscope was invented and in the year 1902 Charles Urban of London exhibited his first educational films. All the films were microscopic, slow motion and of undersea views. In the year 1920 radio entered the educational system; in the year 1930's overhead projectors became part of military teaching. It was widely used by the military to train forces during the World War II and later it was introduced in schools and colleges. In the year 1873 typewriter was invented and it was introduced in education system in the year 1920. During the period of 1950s-1960s instructional television was introduced. In the year 1957 Russia launched its instructional television Sputnik to support its ailing education system. In the year 1989 private company in US launched an educational channel (Channel One) directly to schools for profit. In the year 1960 teaching machine was introduced by the behavioral psychology. It was a remarkable contributed to the educational technology field which changed the academic behavior drastically. The research in computer and educational software during the period of 1950s and 1960s on programmed instruction laid the foundation for the development advance learning system. In the year 1960 computers was first used in education in the way of individualized instruction which became known as computer assisted instruction (CAI). Use of modern technology in present era education started through CAL / CBT / CAI then it moved to Multimedia courseware and know web-based instruction and Computer Mediated Communication (CMC) System. Most of the present educational technology are Perceptual Learning Modules (PLM), Emerging Learning Technologies (ELT), Learning Management System (LMS), Cloud technology are widely accepted and used educational technologies. Learning Management System (LMS) which is also called as Instructional Management System got introduced in

education system. This system is online collaboration and communication tools. It facilitates in collaborating and communicating all the academic participants online at a same time irrespective of geographical location. Presently some of the widely used open source LMS are Blackboard Learning System, Whiteboard, Share point LMS, Sakai, Moodle and ANGEL Learning Management Suite. Modern education system is closely integrated with LMS which combine online course management, communication and collaboration tools which in general include discussion forum, file exchange, email, online journal / blog, real time chat, interactive whiteboard, bookmarks, calendar, search tool, group work, electronic portfolio, registration integration, hosted services, quizzes / surveys, marketing tools / grade book, student tracking, content sharing and object repositories are among the tools offered. Among all modern technology Intelligent tutoring is the latest technology in education system and it works on Inter Net. It has converted all education system of physical nature to virtual. Virtual text books, virtual reference library, virtual tutor, virtual study short cut, virtual study group, virtual guidance, virtual counselor, virtual locker, virtual backpack, virtual notebook. Now present trend of technology in education is Cloud technology. It is facilitating education with high capacity networks, low cost computers and storage devices as well as the wider spread adoption of hardware virtualization, service-oriented architecture and autonomic and utility computing have led to a growth in cloud computing. It can be said that cloud computing is advance version of internet technology.

RESEARCH METHODOLOGY:

Educational institutions across the world are passing through a transformation period. To meet out the social and commercial expectation of stakeholder's government took several initiatives to strengthen and fulfill the demand of technology based, futuristic and carrier-oriented education. It is observed that most of the policies and initiatives were focused on building capacity in terms of student's enrolment and opening new institutions but very fewer efforts are made towards bringing technological and qualitative changes in the institutions and in pedagogy. This present article is undertaking to

1. To study and understand the role of information and communication technology (ICT) in promoting education.
2. To study and examine the role of ICT is promoting modern educational tools and techniques in education and its relative impacts
3. To study and examine the role of ICT in enabling learning, teaching and assessing in education and its overall impacts.

The present research paper is based on secondary data. The researcher tried to follow methodology of Islamic scholar Imam Bukhari who pioneered the systematic secondary data base study and is uncrowned father of systematic secondary data base study. The basic approach adapted in this paper is a balance of qualitative and quantities methods. The analysis has been done in contextual setting and focuses on the evaluation of ICT strategies and theories which were collected from different literature of previous research work. Due to difficulties in obtaining information from primary sources the paper is based on secondary data resources i.e. information that are already been collected and available. The data is mainly extracted from government sources, university websites, books, journals, articles, research papers, blogs, etc. after extensive literature survey and analyzing the research work of eminent researchers and thinkers, it is systematically arranged, and appropriate analysis is carried out to justify the role and impact of ICT. Some of the conclusions based on the study are also drawn.

LITERATURE REVIEW:

Literature review is one of the most important parts of all research activities as it gives reasons and dimensions to study and asses in making comparative analysis of past and present to predict future. Academicians, researchers, social workers across the world carried out extensive researches to find out direct links between ICT use and learner's performance. They all came out with solutions of the prevailing time period complexities and pave the way for future researches. According to the time period they tried to explain the role of technologies in classroom, some tried to explain that technology add value in education, some explored the impact of computer use in education. Present generation of researcher's focus is highly concentrated on the impact of internet on education, online academic activities, digital devises, use of wikis, blog, facebook, researchgate, linkden etc. Among them some fully agree that ICT is playing positive role in promoting education, some consider that it is playing both positive and negative roles.

Kozma (1991) argued that particular forms of media have particular affordances and learning benefits which should influence the choice and use of pedagogy, *Kulik's (1994)* findings revels that in US students who used computer in learning developed diversified range of skills and performed better, *Navarro and Shoemaker (1999)* surveyed a matched pair of on - campus and online sections of a class on principles of macroeconomics. They used a simple comparison of means of test scores and reported no significant difference in academic performance between the two formats, *according to UNESCO*, ICT as the combination of informatics technology with other related technologies, specifically communication technology, *Carlson (2000)* cited the issue of integrating technology with instruction as the single most important issues facing higher education. He further reviled that academe is still lagging behind society at large in the application of some technology trends such as personal digital assistance devices that campus has not been able to integrate into their campus networks, *Brosnan (2001)* found that attitude, motivation, computer anxiety and computer self-efficacy are factors affecting teachers use of computer in their lesson, *Ascough (2002)* considered that good education requires an awareness of the opportunities and limitations of the mode of education, *Hess (2002)* found technology as

devise (gadgets) like phone, computer which represent material entities, *OECD (2002)* defined ICT as a combination of manufacturing and services industries that capture transmit and display data and information electronically, *Coates et al. (2004)* carried out survey and found that face to face teaching format students scored 15 percent higher than online teaching format, *Leuven et al. (2004)* found that there is no evidence for a relationship between increased educational use of ICT and students performance. In fact they found consistently negative and marginally significant relationship between ICT use and some student achievement measures, *Pruulman (2006)* argued that in order to understand the impact of ICT we must go beyond measurement of the diffusion of pieces of hardware and even increases of information in stocks or flows and investigate the social context within which these developments are taking place, *Robert and Lenz's (2008)* from his study tried to assess that e – learning technologies have become sufficiently stable to now allow the focus to shift to instructional quality and content rather than the technology itself, *Chau (2010)* that education will no longer be about learning, but reaching economic goals that are set by the experts with an increasing number of them acting more like corporate executives than educators, *Swati Desai (2010)* argues the role of ICT in transforming teacher centred learning to competency based learning and found that role of ICT in the education is recurring and unavoidable, *Keengwe and Georguna (2013)* argued that integration of technology into education could meet the needs of the Millennials as the generation currently attending universities; they further said that technology should not drive instruction, but should rather be integrated into the curriculum as technology is not a substitute for good instruction, *Verene (2013)* explains that technology does not look back, but promises better future. He further said that with technology we can do better whatever we want to do is a bluff as it creates the impression that there is almost nothing that is not possible with technology, *Olivier (2014)* found that theology took up the challenge to utilise the printing press and should do the same with the new technology. The impact of theology is directly related to the medium used throughout the ages, *Tegos et al. (2016)* research indicated that the effectiveness of flexible conversational agent in productive online peer dialogue, *Barak (2017)* from his study found that how teacher integrate web-based technologies and their perceptions of cloud pedagogy. He found that cloud pedagogy framework facilitates individual and collaborative, synchronous and asynchronous active learning, in class and outdoor, *U.S department of Education (2017)* in their report said that presence of technology does not ensure equity and accessibility in learning; it has the power to lower to both in ways previously impossible. No matter perceived abilities or geographic locations, all learners can access resources, experiences, planning tools, and information that can set them on a path to acquiring expertise unimaginable a generation ago, *Solvi Lillejord, Kristin Borte, Katrine Nesje and Erik Ruud (2018)* in their report presented in Norwegian Higher Education, that higher education institutions are not fully exploiting the possibilities inherent in digital technology. They found that 76 percent of the students reported that digital tools provide flexibility and freedom and are important for their studies, but these tools are infrequently or not used. *S.M.Tariq Zafar, Waleed Hemdat, D.S.Chaubey and Abdul Rehman (2019)* signifies that academic leadership has become larger and more central for the development of qualities of higher education in the country, university need to consciously and explicitly managing the process associated with the creation of academic leadership with their knowledge assets and to recognise the value of their intellectual capital to their continuing role in the society and in a wider global marketplace for higher education.

GROWING USE OF EMERGING METHODS OF MODERN EDUCATIONAL TECHNOLOGIES:

Technology is a powerful tool and it is playing pivotal role in transform all aspect of life. In education it has entered late in comparison to other mode of survival. It facilitates all educational participants and develops advance relationships between educators and students. It is helping society and education participant to reinvent their approaches, it is helping us in learning and collaborating, it is helping us to minimise the long-standing gap and build equity and in adopting learning experiences to meet the needs of all learners. It is helping educators to collaborate and share in learning. It is helping educators to seek new knowledge and upgrade skills along with their students. It is helping educators to become leader and set vision to create learning experiences which provide leverage and support to the students. To make education system more effective, easy and relevant and to provide authentic learning experiences, educator must adopt, and practice technology effectively. For the betterment of the education system all the education stakeholders and participant (Teachers, Faculties, Leader, Researchers, Parents, Policymakers, Financers, Promoters, Technology Innovators and Developers, Society, Community and Organizations) have to adopt and use technology.

ELECTRONIC LEARNING (E. LEARNING):

All electronic source of information which facilitate in learning, training and education program is a part of e learning. It is broad educational concept primarily characterized using electronic information network, media, computer, electronic devices and other types of communication technologies like, internet-based learning, intranet (LAN) extranet (WAN), online education, computer-based training, DVD, You Tube video-based learning, CD – ROM based learning, Webinars, Virtual classrooms, Mobile learning, custom e learning, off – the shelf e learning etc.

Blended Learning:

Blended learning model is a combination of "Teacher, Pedagogy, E – Technology" and Learners. In this, teaching is been carried out face to face in classroom with the use of

E – Technologies Solutions. This model offers synergies between the teaching process and pedagogy with educational technology. In this teacher invest time and create learning materials to manage learners and proceed through all quadrants. Teachers develop dynamic learning environment by facilitating learners with E – Study Materials which generate curiosity among learners to learn. This model allows students to have some control over time, place, path or peace of learning. Students adjudicate at what time they need, at what place they need and what they need in learning. Sometime learners and teachers are face to face in large group, some time they are face to face in small groups and some time learning from their peers, nears and dears. Blended learning facilitates learning activities through variety of technology enabled learning zones optimized for collaboration, informal learning and individual focused study.

Active Learning:

Growing ICT use in education has enabled learners in many ways. These learners are learning according to their desires, need and requirement. ICT mobilizing required tools for examination and calculation. It is facilitating learners to make an appropriate analysis and it is serving as an active learning platform for students where student can enquire and construct new information of their use. It is making learning more relevant and appropriate to their life situations. ICT transformed traditional pedagogy of memorization into enhanced learning through increased learning engagements. It developed just in time learning system in which active learner choose what they want to learn and what and when they need to learn.

Collaborative Learning:

ICT use in education has developed a deep link and a sound relation among learners, teachers and experts. It encourages interaction among them irrespective of their cast, creed, religion and destination. Educational ICT has created, is creating and will create opportunity for all educational participants and is helping learners in teaming and enhancing participant communication skills and their collective awareness. This collaborative learning is not limited to particular age but throughout the life learners can expand their learning. They can collaborate across the world with pears, experts and mentors of diversified fields.

Integrated Learning:

Educational ICT has enhanced learning and elevated learning standard. It promoted thematic integrative approach of teaching and learning rather than memorization. Integrated learning modules of educational ICT are basically thematically focused classes and are delivered primarily over internet. The course content is integrated and comprehensive according to the themes. Content is also integrated with language and facilitate learners to learn both content and that through additional language. It stimulated in depth discussions and forced teachers to rethink, redesign and keep on updating their pedagogical models according to the theme. This module also eliminates the artificial separation between various academic discipline, theory and practice.

Creative and Innovative Learning:

Through technology educators are connected to global educators and experts. Educational ICT has provided a common platform to all academic participants. It has empowered educator to become co – learner, innovative learner and creative learner with their students by exploring the thematic content deeply. Educators by connecting with global academic network can develop creative and innovative pedagogical approach and content. Through educational ICT use educator can share their creative and innovative views with educator community and with students. ICT supported learning promotes innovation among educator they can collect the available information and can redesign it and present it in creative and innovative form. Educator and learner can become engineer of collaboration, designer of creative learning experiences, leader of innovative learning, guides and catalyst of change. All creative and academic innovation elements make learning relevant and authentic. By using innovative tools such as video conferencing, online chat and social media sites educators can connect and collaborate with students and share information's, views and experiences.

Evaluative Learning:

Educational ICT use has enhanced the learning of student which is directed and diagnostic in nature. Educational ICT is highly distinct than traditional print-based education. It recognizes presence of diversified range of learning pathways and facilitates learners to explore and discover new dimensions of themes and contents rather than merely listen and memorize. New society requires new skills which is possible only through systematic evaluation of traditional and emerging pedagogy to match the requirement. Educators can lead the evaluation and implementations of new technologies of learning's. ICT facilitates teacher leaders and learners learning through technology and working with administrators to determine how to share their leaning with others.

Learning through Blogging:

Blogging is an active and widely accepted and standardized type of informative website. It is mostly used and maintained by an individual person. In this individuals account holder upload personal events, descriptions of events, commentary, political, social and academic views and share free available graphics and videos. All blogs are free to interact and comments on events are highly desired and acceptable. Through educative blog learners and experts interact frequently and share experience and clarify the doubts through discussion and debate. Learners post their question and seek answer and information from the global experts and users.

Learning through Podcast:

Podcast is non-streamed web cast. This approach facilitates educators and learners through series of audio or video files which are released in form of episode and participants download these uploaded materials through web syndication. Uploaded audio or video files are delivered differently in podcast than other sources of files accessing media on net. All the associated files are maintained and controlled centrally on the distributer web feed. Learners and other participant in podcast approach use pod catcher to access this web feed and download files from the

available series. Through this ICT approach learners update, demand and download specific information's according to their need.

Ubiquitous Learning:

Ubiquitous learning or U- Learning is flexi mode learning approach and based on ubiquitous technology. In this approach ubiquitous learning environment is constructed which facilitate participant to participate, learn and acquire information and knowledge in flexible mode at any place and anytime. This approach of learning has grown due to ever growing and innovative computer and its supportive technologies, free and flexi software technologies, up - gradation of wireless technology and free and open network. Due to these attractive attributes it attracted educators and learners to participate in learning activities on U Learning according to their convenience.

Open and Distance Learning:

Open and distance learning is one of the effective ways of providing learning opportunities to the academic participant who are living scattered or due to some reasons they cannot become regular students. It is characterized by separation of teacher and learner in time or place, or both time and place. Learning is certified through affiliated institution or recognized agencies. Educational ICT is playing instrumental role in promoting open and distance learning. It is facilitating participant through variety of E - media platform along with traditional pedagogy. It facilitates two-way communications between educator and learner through virtual interactive classes. It is facilitating in conducting exam and providing all the required study content to educator and learners.

Web Seminar Learning:

Web seminars are now growing with the help of educational ICT. It is facilitating educators and learners to participate, interact and attend experts through web seminars. It is flexi and convenient approach of attending virtual seminars. Colleges have limited budget and cannot afford to organize or send their students to attend seminars and field trips related to their course of study. To avoid academic loss students, educators and other academic participants can virtually attend web seminars organized by other academic institutions through using internet. In America NASA offer programs that allow students to talk to astronauts is space.

Digital Citizenship:

Through educational ICT use educator and learner can adopt digital citizenship. For educator, learners and other educational participant it is safe, ethical, responsible and informed use of technology. Through digital citizenship concept in educational ICT educator and learners can avail opportunity to encompass a range of skills and technical literacy's which are internet safety, privacy and security, cyberbulling, online reputation management, communication skills, information literacy and creative credit and copyright.

Learning through Technical Agency:

Learners with the help of technical agency makes things happen intentionally. Educational Technical Agencies supports people to play positive and active role in self-development and self-renewal according to the prevailing time. With the help of educational technical agencies learner build this capacity and strength and they chose what they need to learn purposefully and meaningfully and practice to develop efficiency. Learners with the help of educational technology developed expertise, ability and skills, successfully laid the foundation for lifelong and self-directed learning.

Mobile Learning:

Hybrid mobiles are minicomputer and facilitating all academic participants in many ways. It has emerged as a most competitive mode of educational learning tool. Educator must develop new and extended learning designs that link pedagogical strategies effectively. New created mobile learning content design must consider the basic required outcomes, futuristic pedagogy, and educational ethics and cost effective. In mobile learning integration, support, interactive use and appropriate choice of tools are important factors of pedagogy.

INFORMATION AND COMPUTER TECHNOLOGY (ICT) ENABLED LEARNING:

Growing use of ICT in education has provided multiple academic platforms to access learning. It has enables adult learners and traditional students to access learning opportunities apart from the traditional barriers of time and place. It is facilitating students who are in job or are dropout but want to continue their study to access learning opportunities outside the educational institutions. It is providing high quality learning materials and their resources to students without any geographical boundary. It is enhancing learner's learning's experience through blended learning approach. To facilitate learners and educator's ICT is providing opportunity to students to combine online and in person learning and it is accessing resources to students and guiding them to complete some academic activities conveniently and participate later in group discussions. It is helping educator to assess student's academic strength and compare their past and present level knowledge, their interest and motivation and support them to develop excellence. It is helping educator to provide personalize feedback, instructions and additional academic supportive material to students. ICT is also facilitating students to connect to non-academic support and helping them to manage their personal life challenges which might become obstacle in learning. It is also helping disable students especially in higher education and ensuring their active participation in educational programs and in other academic activities. It is providing them auxiliary aids and services for better communication. It is providing text books with speech to text assistive technology etc.

INFORMATION AND COMPUTER TECHNOLOGY (ICT) ENABLED TEACHING:

Educational ICT enabled the educators to use technology to improve classroom experience. Educator can use collected data about the student learning and suggest academic and non-academic interventions. ICT helps educator in developing personal connection with learners and provide

them tailored feedback about their performance. By using educational ICT educator can support students with additional study contents and can guide them how they can avail the academic opportunities for their overall growth and development. By using ICT educator can assess the level of student's knowledge, motivation and academic interest and can guide them according to their required deficiency and strength. ICT use serves as a catalyst for intentional planning which in result lead to improved learning outcomes for students. Educator can use ICT latest technology to evaluate student's efficiency and overall performance. They can assess which technology application is relevant and proving linkage to the improvements in students learning. ICT based collected information can be used by the educators to adjust, redesign and remake their teaching content, attitude and approach to bring improvement, develops efficiency and consistency in teaching practice. ICT generated data help educator to evaluate their effectiveness and efficiency in modern and competitive teaching in comparison to students learning outcome. Educational ICT also facilitate educators to create active learning environments and adopt creative and innovative content delivery in classroom and online. Educators by implementing ICT tools can also provide personalized and connected experience to all students. Educator can develop strategic pedagogy with the help of educational ICT. Keeping well defined learning goals in mind educator can collaborate with online solutions and facilitate students in personalized manner. Educator by using ICT can assess students in advance learning and can support students individually according to their strength and weakness. ICT has enabled educator to become more responsive and available instrument of student's support system. Educator can use educational ICT and develop high quality academic content to support student's education and facilitate them at low cost.

INFORMATION AND COMPUTER TECHNOLOGY (ICT) ENABLED ASSESSMENT:

Educational ICT use has enabled educator, institutions and learners to make authentic assessments across diversified range of courses, techno base pedagogies and their applications and student's strength and weakness. Educational ICT enabled the educator to find out the learning capacity of students and improve teaching practice by bringing modification through using educational ICT. Through the use of educational ICT educator can assess student's performance, motivation, academic interest, attitude, behaviour and quest of learning minutely and can compare it with the set parameters. Base on finding educator can guide students for improvement and can provide students clear and transparent report of their progress and skills. Educator can preserve techno base assessment records and can verify time to time to make comparative analysis of improvement in students learning. Educator can use educational ICT to assess students through formative learning activities. Techno base formative assessment will provide prompt feedback to the students, peers and educators which ultimately help students to bring improvement in their learning performance and help them in developing competitive strength to meet the global requirement.

COMMODIFICATION OF EDUCATION AND ITS IMPACT:

Modern ICT base education is a socio-economic commodity and is geared toward the market rather than for citizen. Most of the institutions are selling the expertise of their researchers through academic consultancies. In global era academic activities and its outcomes are assessed and interpreted by economic criteria. Scientific research patent is a kind of research commodification, in social science commodifcation of research is in form of contract research. In business studies commodification is in form of business consultancy. Decline of socialist economy and growth of capitalist economy decreased government funding in education and its policy of public and private participation (PPP) in education became the major reason of educational commodification. Modern education system is knowledge-based economy and technology is a central part of it and this system use market principles and practices with the ideology of capitalism. Education has become socio commercial business and investors want to recover their investment with profit as soon as possible. Only mathematical calculation of investment recovery with profit is the ultimate motive. This profit motives derived institutions to induct more and more technology and launch more and more online educational programmes. Through techno base policy they promoted education and converted education into commodity. Profit motive replaced social motive of education and quality became secondary. Due to commercialisation of education and extensive marketing online and distance education became preferable mode of education and ultimately resulted decline in quality, standard and overall learning. This profit intensive commodification converted educational institutions into training centres instead of place of learning. The promoted myth of profit-oriented institutions that rapid change in global technology requires skilled workers who must have technological IQ and commonsense. And modern society relies on technology and its adoption is directly linked to the education of the labour force captivated the mind of society. It is a core fact that technological access, growth and literacy are growing challenge in developing nations and these challenges have created digital divide within the nation and among the nations. To bridge this divide online education which is techno base facility is provided to the students. It solved the purpose of profitability but in reality, it failed to solve the student's purpose. Not everyone has access to this technology or the skills to use it and therefore no benefit from it. Without technical education nation will be excluded from global development and access of educational technology will bring risk of unemployment. It is also assumed that ICT based educational will improve people's lives but no satisfactory proof in developing nation is found. More emphasis on advancement of educational ICT will lead to more poverty, crimes and exclusion if it is not corresponded by the life survival

opportunity. When students lack the capacities to exercise the opportunity then opportunity is empty.

POSITIVE INFORMATION AND COMPUTER TECHNOLOGY (ICT) IMPACT IN EDUCATION:

Present world is moving on technology and expected future is the same. Expecting things without technology is impossible. In present era of civilization, it is difficult to imagine learning environment without ICT. Use of ICT in modern society has grown tremendously and became a critical vehicle and has impacted the complete learning process. By adopting ICT teachers become more collaborative, competitive and futuristic and extended learning beyond the classroom. By using educational ICT educators became able to create learning communities in which educator, fellow educators of the institutions, educators and experts in various discipline from other institutions and across the world, students, parents, local's community organizations, museums, libraries and alimony programs are active participant. Educational ICT uses enhanced collaboration and enabled educator to develop standard pedagogy, specialized curriculum, teaching methodology, course content and other supportive materials. By using ICT tools and resources educators are efficiently and effectively managing, assessing and evaluating their quality and usefulness and impacting students learning. By using ICT educator have become global, they are not only mentoring their institute students, but they are also mentoring learners across the world. They became able to prepare pedagogy professionally, became able to rethink, readjust, redesign and revise their course content and study material along with instructional approaches, techniques, tools, skills and their respective expertise. By the use of ICT, they became more mature learners and also co learners with their student's colleague and experts and explored academic potential to the full and build academic strength. By using the ICT, they became collaborative engineer, architect of learning experience, a guide and a change agent. By using educational ICT like videoconferencing, online chat, collective social media sites, educators are integrating, coordinating, and collaborating rural and urban learners with experts and peers and making classroom learning relevant and authentic. ICT provided platform to the academic participants and encouraged them to invest in it personally and developed their teacher leadership plans. ICT converted traditional education and knowledge society into knowledge economy and enhanced the skills of educators and learners. ICT reduced the cost of educational material and enabled students to adopt rapidly changing technological environment with ease, they became able to use technology to explore opportunities and shape their lives, their community and the world. The use of net has enabled the sharing and easier accessibility of books and scientific books which has increased students' knowledge and learning. Introduction of ICT in classrooms has impacted positively, digital boards attractive features have improved learning base of students. Use of educational ICT helped nations in reducing the teachers to student's ratio where they were high in comparison to international recommended standards. ICT use helped the institutions to identify their social, regional and global status. It helps institutions to make effective and authentic SWAT analysis of their institutions and take necessary action for the betterment of the institution. The greatest achievement of educational ICT is that it converted world into village and helped education to penetrate deep in society at low cost with ease in the form of distance education and online education.

NEGATIVE IMPACT OF INFORMATION AND COMPUTER TECHNOLOGY IN EDUCATION:

Presence of technology does not mean that it is the ultimate and last resort to all educational problems and will ensure equity and accessibility in learning. There are complexities of intellectual property rights which arise when software is downloaded or shared without proper permission. Due to net and easy accessibility plagiarism has increased which impacted decline in educational standards. Due to access technology unwanted, baseless and fake information are also on rise and impacting learners and researchers. Maximum study materials are available in short and for more they charge high cost. Frequent change in technology also impacts negatively as users have to pay for advance version. Instructor cannot adopt and afford the cost of frequently changing ICT gadget, and also, they are not clear about the benefit of the technology. Frequently changing technology and software's also de-motivate educator as they have to invest time in preparing the course content according to the new technology and software. ICT is general purpose technology (GPT) and is considered as immature by nature and it needs to be specified to meet the needs expressed by the students. Before adopting ICT fully, it is needed to explore its possibilities, potentialities, accessibilities and reliabilities by the academic institutions. Apart from educative information and study material accessibility many social damaging information's and video materials (pornography) are available on net and have impacted society very drastically. ICT has also created digital divide, students have computer and other facilities in institutions but not at home and poor nation's institutions do not have proper facilities in institutions and students do not have any technical excess at home. Technology converted world into village but created distance among the society, due to increase technology society lost human relation and converted responsibilities into opportunities. Learners highly depending upon ICT lose their analytical skills, mathematical skills and judgmental skills.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS:

- The study found that ICT have played a catalyst role in promoting the education. It has casted profound impact on the process of learning by offering new opportunities to learners and

educators and enhanced the student performance and achievement.

- The study found that ICT has enabled and improved learning at all levels, in all places and for all people of all backgrounds.
- The study found that student's performance, achievements and learning has grown profoundly by adopting complementary organizational innovations. They have acquired new skills, new competencies, collaborative attitude, team building mechanism and project management expertise.
- The study found that ICT has transformed education from traditional to knowledge economy and fostered the professional learning by supporting educators and making them catalyst to serve the underserved. It has made educators more creative and collaborative problem solvers and adoptive and socially aware experts by fluently using innovative technology.
- The study found that ICT base learning environment facilities has enhanced student's collective capability and skills and made students, learners and educators more active, collaborative, creative, integrative, cooperative and evaluative. It has become more appropriate, relevant, authentic and effective in the realization and implementation of the pedagogy of constructivism that generated greater responsibility of learning for students.
- The study found that educator, policymakers, administrators and teachers are using ICT tools and resources and collaborating with other educational participants researchers, families, cultural and professional institutions and other stakeholders and eliminating inefficiencies, digital divide, inequality and stretching beyond the walls of traditional classrooms and promoting everywhere and all time learning and making effective assessments by analyzing individual abilities, need, interests and overall strength and weakness of a students.
- The study found that presence of technology does not ensure equity, and accessibility in learning. In comparison to other sector impact of ICT in education is found low and slow. Among the factors most obvious factors are insufficient funding for technological adoption and up-gradation, lack of proper training to the teachers, lack of motivation, time constraint, trained manpower in teaching sector and lack of infrastructure in rural area.
- The study found that due to growing competition in education sector and market demand, it is showing progress and educational institutions are gradually adopting ICTs into classroom, learning setting, for developing efficiencies and flexibility in terms of delivery of information's and to provide support for customized educational programs to meet the need of individuals learners.
- The study found that on net there are infinite number of wastes, contemporary, vulgar materials are freely and easily accessible to the learner which has consequently destroyed the human values, ethics and culture of the society.
- Last but not the least it is found that most of the institutions have adopted internet and www as an essential tool for information communications.

Study concludes that due to ICT human quest for knowledge has greatly improved and world has become small village with better living standards. Teaching with educational ICT can enhance student's active learning only through joint, coherent and multi-level efforts. Rapid changes in technologies are indicating that the role of educational ICT in future will grow tremendously in the education. Thus, future of education is in the hand of educational technology and we must support, coordinate and integrate our efforts to build progressive techno civilization.

RECOMMENDATIONS:

If you want to save the nation, then educate the people. Thus, development of the nation depends upon the quality of education programs offered to its citizens. Keeping nation interest in view the carried-out study recommends that educational institutions must adopt technology for its collective growth, but its implementation must follow scholarly approach. It must focus on training teachers in advance skills and introducing creative and innovative pedagogies, developing ICT infrastructure and establishing institutional network, improvising collective standard of education by minimizing the digital gap and in quality of education between rural and urban populace. It must be aligned with nation's goals and strategies for teaching and research. Technology investment is not one-time expenses it is a recurring expense, when devises reaches the end of life then infrastructure equipment's becomes obsolete and thus needed to be replaced or upgraded. So, the planner must consider technology an ongoing, line – item expense and it must be according to futuristic expectation of learners and it must be regularly tested and evaluated in variety of formats and must be renewed and redesigned according to the acknowledged and familiar academic work procedures, data bank, students' feedbacks, teacher feedback and new research. Objectivity of ICT must be to foster self-paced, self-assessed and self-directed learning and developing futuristic policies for academic growth and social equity. Education is holistic in nature and need leadership and for the purpose of achieving it collaborative efforts must be implemented.

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DECLARATION

Dear \Sir \ Madam

With deep regard and faith in your jurisdiction I "Dr S.M.Tariq Zafar "submitting research paper, title **"Role of Information Communication Technology (ICT) in Education and its Relative Impacts"** in your prestigious college upcoming conference. I hereby solemnly declare that research work is original in all regard and has not been submitted to any journal for publication or submitted in any conference for presentation.

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