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THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN ENHANCING THE QUALITY EDUCATION OF ETHIOPIAN UNIVERSITIES: A REVIEW OF LITERATURE

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ABSTRACT

Globalization, enhanced by the devices of Information and Communication Technology (ICT) has greatly challenged the quality education of university. The use of ICT in education lends itself to more student-centred learning settings and often this creates some tensions for some teachers and students. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. This study discusses the roles of ICT in enhancing quality education. Information Communication Technologies (ICT) at present are influencing every aspect of human life. They are playing salient roles in work places, business, education, and entertainment. The paper further highlights the hindrances associated with the use of ICT in quality education such as insufficient ICT facilities, epileptic electricity power supply, teachers' lack of ICT knowledge/skills, difficult to integrate ICT to instruction, insufficient teacher time, not enough simultaneous access, not enough supervision staff and lack of technical assistance. The review concludes that regardless of all the limitations characterizing it, ICT benefits education systems to provide quality education in alignment with constructivism, which is a contemporary paradigm of learning. The paper then recommend that, the government of Ethiopia should pass a bill at the national assembly on the use of sophisticated ICT facilities in the educational system by provision of adequate fund, securing of ICT experts in institutions and schools and ensuring that these facilities are monitored from time to time.

KEYWORDS

Ethiopia, Information and Communication Technology, quality education, universities.

1. INTRODUCTION

Education is the backbone of a nation. Education is seen as a key for transformation of individual for National development. A nation is said to be valued when a sizeable number of the citizens have quality education. Quality education includes: Learners who are healthy, well-nourished and ready to participate and learn and supported in learning by their families and communities; environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities; content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life, and knowledge in such areas as gender, health, nutrition, HIV/AIDS prevention and peace; processes through which trained teachers use student-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities; and outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society (Daniels, 2002; UNICEF, 2002).

In many countries, demand for university far outstrips supply and Governments and institutions are turning more and more to the use of ICTs to bridge the access gap. It is too early to say whether the role of ICTs in the teaching function of university is truly transformative, or whether it is simply a repackaging of previous pedagogy. ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Effectiveness, cost, equity, and sustainability are four broad intertwined issues which must be addressed when considering the overall impact of the use of ICTs in enhancing quality education. The educational effectiveness of ICTs depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery, ICTs do not work for everyone, everywhere in the same way.

2. BACKGROUND

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings (Haddad & Jurich, 2002). If Ethiopia as a Nation needs to improve her quality in education the essentials of Information and Communication Technology (ICT) in her educational system needs urgent attention. Educational systems around the world are under increasing pressure to use the new Information and Communication Technologies (ICTs) (Yuen, Lee, Law & Chan, 2008). Similarly, Nwosu and Ugbomo (2012) opined that, the field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries. ICT has made an impact on the quality and quantity of teaching, learning and research in the tradition and/or distance education institutions using it (Kwacha, 2007). The need for re-orient and re-engineer of its formal education patterns for transformation of its citizens is vital. Nwosu and Ugbomo (2012) assert that, 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. UNESCO (2002) points out that "this vision of education emphasizes a holistic, interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles.

In the past universities have provided little choice for students in terms of the method and manner in which programs have been delivered. Students have typically been forced to accept what has been delivered and universities have tended to be quite staid and traditional in terms of the delivery of their programs. The uses of ICTs provide many options and choices and many universities are now creating competitive edges for themselves through the choices they are offering students. These choices extend from when students can choose to learn to where they learn (Oliver, 2002). Another way in which emerging ICTs are contributing significantly on the content of education curricula stems from the ways in which ICTs are dominating so much of contemporary life and work. Already there has emerged a need for universities to ensure that graduates are able to display appropriate levels of information literacy, "the capacity to identify and issue and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it" (Haddad & Jurich, 2002). However, Law, Pelgrum and Plomp (2008) opined that, acquisition of Information and Communication Technology (ICT) skills include the ability to become lifelong learners within a context of collaborative inquiry and the ability to work and learn from experts and peers in a connected global community. According to Webb and Cox (2004), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus it has radically changed traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both instructors and students. For developing countries, ICTs have the potential for increasing access to and improving the relevance and quality of education (Nwosu & Ugbomo, 2012). Nwosu and Ugbomo further stated that, when used appropriately, different ICTs helps to expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life. Information, Knowledge, and Communication Technology also play vital role in the growth as well as producing and offering goods and services at relatively reduced costs.

3. STATEMENT OF THE PROBLEM

Smart use of ICTs can process information, create knowledgebase and make them available wherever and whenever necessary. But despite having relatively poor economic condition, Information and Communication Technologies (ICTs) in most cases have tremendous success in providing services at reduced costs to the people's door steps. ICTs have the same to do for making the university available to all classes of people throughout the country at a lower cost. As a result, on one hand people will have the access right on university and on the other hand will gain the necessary knowledge, skills, and experiences to serve the nation and prosper accordingly.

This current era of globalization, enhanced by ICT innovations, stands to improve the quality of students learning from Ethiopian universities. This is premised on the fact that ICT tools, if well positioned, could help to maintain and enhance education quality as new ways of teaching and learning, research and development, and acquiring and disseminating knowledge are made possible. The end result of this would be graduates with the appropriate knowledge, skills and competencies needed in the world of work, moving Ethiopia closer to the standards and productivity of the other countries competing in the global economy. This paper examines the roles ICT facilities might play in enhancing the quality education of Ethiopian universities.

The purpose of this paper aims to bring together the findings and key points from a review of significant part of the available literature associated with ICTs for Education and ICTs in Education. This review set out to identify and evaluate relevant strategies in national and international research and initiatives related to measuring and demonstrating the effective use of ICT for education with regard to the teaching learning process; ICT and quality and accessibility of education; ICT and learning motivation, ICT and learning environment, and ICT to enhance the scholastic performance. Hence, the main objectives of the paper are to evaluate the importance of ICT in university education and to analyze the government initiatives for development of ICT in university quality education.

SPECIFICALLY, THE OBJECTIVES OF THIS STUDY ARE:

- to assess the benefits of ICTs in enhancing quality of education.
- to investigate the current status of ICT-based universities in Ethiopia
- to explore the limitations and key challenges of ICTs integration to education systems

Therefore, this review paper discusses the roles of ICTs, the promises, limitations and key challenges of integration to enhance quality education systems. The review attempts in answering the following questions:

1. What are the benefits of ICTs in enhancing quality of education?
2. What are the existing promises of ICT use in education systems of Ethiopian universities?
3. What are the limitations and key challenges of ICTs integration to education systems?

4. THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN ENHANCING QUALITY EDUCATION

In this paper, the researcher is concerned with the way in which ICTs can play a role in enhancing quality education at the universities. ICTs open up new ways of accessing information thereby changing the relationships between students and between students and their teachers. In addition, ICTs enable teachers to transform their teaching practices by facilitating student-student discussion and collaboration or by simulating 'real-world' problems thus providing students with authentic learning experiences.

In this section, the researcher discussed how ICT enhancing quality of education/teaching and learning process; the concept of information and communication technology (ICT); the benefits of ICT in enhancing quality education; how ICT enhancing learning, environment, motivation and the scholastic performance; some of the teaching and learning challenges that hinder ICT in enhancing quality education by teachers and students in university.

4.1 THE CONCEPT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Introducing Information and Communication Technology (ICT) as a tool to support the education sector has initiated substantial discussions since the late 1990s. A decade ago the emphasis was on Technical and Vocational Education and Training and training teachers. During the last few years, an increasing number of international development agencies have embraced the potential of ICT to support the education sector.

ICT is a term used to refer to technologies that are used in creating, accumulating, storing, editing and disseminating of information in various forms. ICT as described by Bandele (2006) is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavour. These include: Internet access, electronic mail, CD-ROMS, telephone, on line databases, library services and fax machines Nwosu and Ugbomo (2012). Webb and Cox(2004) grouped ICT used in education into two categories namely synchronous and asynchronous media. Synchronous media require all participants to be together at the same time even though in different location, examples of synchronous are audio graphics, audio conferencing as in a telephone conference, broadcast radio and television, teleconferencing, computer conferencing such as chat and internet telephony. Asynchronous ICT allow for participants in the learning process to be at different times and different places, examples of asynchronous include audio and video tapes CDs, email, computer files transfers, virtual conferences, multimedia products, offline, web based learning formats. Teleconferencing is used in both formal and non-formal learning contexts to facilitate teacher-learner and learner-learner discussions, as well as to access experts and other resource persons remotely. In open and distance learning, teleconferencing is a useful tool for providing direct instruction and learner support, minimizing learner isolation (Tinio, 2002).

Information and Communication Technologies (ICTs) are referred to as the varied collection of technological gear and resources which are made use of to communicate. They are also made use of to generate, distribute, collect and administer information. ICT is a force that has changed many aspects of the way we live. Information and Communication Technologies (ICTs) consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical telecommunications systems and networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing and presentation.

Information Technology (IT) is concerned with managing and processing information using electronics, computers and computer software to convert, store, protect, process, transmit and retrieve information. The advancement from Information Technology (IT) to Information and Communication Technology (ICT) was the result of the advent of the Internet, broadband connections and broad wave transmission energy, enabling a wider applicability in business, education and the like (Webb & Cox, 2004). ICTs are used as productivity tools or enrichment resources; this generally means that they support the traditional teacher-led mode of instruction in subject areas such as math, language, social studies, or science.

Transformative applications of ICTs refer to non-traditional emerging uses where exposure to and deployment of ICTs fundamentally change the way education is conceived and delivered to students. ICTs are enablers that optimize student-centered pedagogical methods. They are used to develop broad, generic skills such as problem solving, independent and collaborative learning, and communication. They lead to more individualized instruction, less didactic delivery, and an emphasis on problem-solving and cooperative learning situations. Teachers assume the role of facilitators and skills developers. They help the students achieve a greater understanding of information by making use of new technologies.

The experience of introducing different ICTs in the classroom and other educational settings for universities all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology indeed, given enough initial capital, getting the technology is the easiest part – but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others. Knowledge, skills and competencies have quickly become economic commodities and there is consequently legitimate pressure on national systems to enter and thrive in the competitive global market where knowledge is central to success. There is thus the urgent need for sustainable quality education in Ethiopia universities powered by ICT tools. Such procedures would bring Ethiopian universities and students on par with others and ensure that the globally accepted Millennium Development Goal is better maintained.

4.2 ICT ENHANCING THE QUALITY AND ACCESSIBILITY OF EDUCATION

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). ICTs have the potential to 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 (Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must include ICTs in the global village.

Conventional teaching has emphasized content. For many years courses have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring 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). The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. According to Zhao and Cziko (2001) three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly (Smeets, 2005). Varma (2008) conducted case studies in three primary and three secondary schools, which focused on innovative pedagogical practices involving ICT. Varma (2008) concludes that the benefits of ICT will be gained "...when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. As a consequence, the use of ICT will not only enhance learning environments but also prepare next generation for future lives and careers (Wheeler, 2001). Changed pool of teachers will come changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles (Littlejohn et al., 2002).

According to Varma (2008), the flexibilization time-space accounted for by the integration of ICT into teaching and learning processes contributes to increase the interaction and reception of information. Such possibilities suggest changes in the communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favour both individual and collaborative learning". The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Cross & Adam, 2007), the influence of the technology on supporting how students learn will continue to increase. In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (Haddad & Draxier, 2002). As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become. Teachers generate meaningful and engaging learning experiences for their students, strategically using ICT to enhance learning. Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which they will need in their future lives.

The major teaching and learning challenges facing in university revolve around student diversity, which includes, amongst others, diversity in students' academic preparedness, language and schooling background. Education is perhaps the most strategic area of intervention for the empowerment of human in any society and the use of Information and Communication Technologies (ICTs) as an educational tool in the promotion of human's advancement has immense potential. The application of ICTs as a tool for effective enhancement of learning, teaching and education management covers the entire spectrum of education from early childhood development, primary, secondary, tertiary, basic education and further education and training.

Tinio (2002) further noted that ICT can expand access to education in the following ways:

Access to remote learning resources: Teachers and students no longer have to rely solely on printed books and other materials in physical media housed in libraries and available in limited quantities for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. This is particularly significant for many universities in developing countries that have limited and outdated library resources. ICTs also facilitate access to resource persons-mentors, experts, researchers, professionals, business leaders and peers all over the world.

Improving the quality of education and training is a critical issue, particularly at a time of educational expansion: ICTs can enhance the quality of education in several ways; by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training (Haddad & Draxier, 2002). ICTs are also transformational tools which, when used appropriately, can promote the shift to a learner-centred environment.

Motivating to learn: ICTs such as videos, television and multimedia computer software that combine text, sound and colourful moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, net-worked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.

Enhancing teacher training: ICTs have also been used to improve access to and the quality of teacher training. Integrating ICT in teaching and learning is high on the educational reform agenda. Often ICT is seen as indispensable tool to fully participate in the knowledge society. ICTs need to be seen as "an essential aspect of teaching's cultural toolkit in the twenty-first century, affording new and transformative models of development that extend the nature and reach of teacher learning wherever it takes place" (Chandra & Patkar, 2007). For developing countries like Ethiopia, ICT can moreover be seen as a way to merge into a globalizing world. It is assumed that ICT brings revolutionary change in teaching methodologies. The innovation lies not per se in the introduction and use of ICT, but in its role as a contributor towards a student-centered form of teaching and learning.

ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning. In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Cholin, 2005). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace.

One of the most vital contributions of ICT in the field of education is- *Easy Access to Learning*. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002). Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. As well as learning at anytime, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage (Young, 2002). Thus, ICT enabled education will ultimately lead to the democratization of education. Especially in developing countries like Ethiopia, effective use of ICT for the purpose of education has the potential to bridge the digital divide.

The Information and Communication Technology (ICT) curriculum provides a broad perspective on the nature of technology, how to use and apply a variety of technologies, and the impact of ICT on self and society. Technology is about the ways things are done; the processes, tools and techniques that alter human activity. ICT is about the new ways in which people can communicate, inquire, make decisions and solve problems. It is the processes, tools and techniques for:

- gathering and identifying information

- classifying and organizing
- summarizing and synthesizing
- analyzing and evaluating
- speculating and predicting

Enhancing and upgrading the quality of education and instruction is a vital concern, predominantly at the time of the spreading out and development of education. ICTs can improve the quality of education in a number of ways: By augmenting student enthusiasm and commitment, by making possible the acquirement of fundamental skills and by improving teacher training. ICTs are also tools which enable and bring about transformation which, when used properly, can encourage the shift an environment which is learner-centered. ICTs which can be in the form of videos, television and also computer multimedia software, that merges sound, transcripts and multicolored moving imagery, can be made use of so as to make available stimulating, thought provoking and reliable content that will keep the student interested in the learning process. The radio on the other hand through its interactive programs utilizes songs, sound effects, adaptations, satirical comedies and supplementary collections of performances so as to induce the students to listen and get drawn in to the training that is being provided.

ICT according to a number of commentators, enhance teaching, learning, and research, both from the constructivist and instructivist theories of learning. Behind this increasing faith in the role of technology in higher education however, lies implied acceptance of technology by various commentators, either as neutral and autonomous, neutral and human controlled, autonomous and value laden, or human controlled and value laden.

The main objective of the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2009) is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication in order to foster universal respect for justice, the rule of law, and the human rights and fundamental freedoms that are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations. UNESCO's principles on ICT in education can be summarized as follows:

- Old and new technologies need to be used in a balanced way. On-the-air and off-the air radio/radio-cassette, television and offline video-assisted technologies are still considered valid and cost-effective modes of education delivery, as important as more interactive computer/Internet-based virtual education or online distance learning.
- Meeting the international education goals by 2015 will require huge investments in teacher training institutions.
- The demand for higher education cannot be met in both the developed and developing world without use of ICT, distance or virtual modes of learning.
- Vocational training needs cannot be met without virtual classes, virtual laboratories, etc.
- Educational goals cannot be met without gender sensitivity. Wherever possible, the proposed indicators will address the need to measure the gender gap.

4.3 THE BENEFITS OF ICT IN ENHANCING QUALITY EDUCATION

Tools are now available on the Internet to assist both teachers and students to manage writing assignments to detect and avoid the pitfalls of plagiarism and copyright violations. One of the great benefits of ICTs in teaching is that they can improve the quality and the quantity of educational provision. For this to happen however, they must be used appropriately. While using ICTs in teaching has some obvious benefits, ICTs also bring challenges. First is the high cost of acquiring, installing, operating, maintaining and replacing ICTs. While potentially of great importance, the integration of ICTs into teaching is still in its infancy.

There are numerous benefits derived from the use of ICT tool in enhancing quality ICT education such as the ability for learner to choose when to learn irrespective of geographical location without stress. Secondly, ICT also enable learners to discover and explore new ideas or innovations from experts around the global world through the use of the common ICT available facilities. Thirdly, the existence of ICT into education system, will enable delivery of teachers to students, monitoring of learner progress and assessment can be done timely. However, Nwosu and Ugbomo (2012) listed the following as the benefits derived from the use of ICT in education:

Active learning: ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information. Learners therefore learn as they do and, whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to the learner's life situation. In this way, and in contrast to memorization-based or rote learning, ICT enhanced learning promotes increased learner engagement. ICT-enhanced learning is also "just-in-time" learning in which learners can choose what to learn when they need to learn it.

Collaborative learning: ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modeling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners' teaming and communicative skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields.

Creative Learning: ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the regurgitation of received information.

Integrative learning: ICT-enhanced learning promotes a thematic, integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach.

Evaluative learning: ICT-enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember.

4.4 CHALLENGES THAT HINDER ICT IN QUALITY EDUCATION

However, investment in ICTs has been controversial. The educational system is fraught with problems and universities typical of the Third World. Chandra and Patkar (2007) in his paper identified some problems related to ICT-based education: technology and moral issues, affordability, technological imperialism, socialisation and humanisation of technology, appropriateness and acceptability. Opportunities offered by ICT-based education may not be beneficial to all learners in countries with different socio-economic, political and cultural environments. The availability of knowledge through technology may cause serious maladjustment to the people of many developing countries. The cost of establishing and maintaining the program economically, culturally, socially or politically must be affordable as globalised system of education. Any replacement or reformation of the use of technology in developing countries needs to be harmonised socially, culturally, economically. Each technology has its own strengths and weaknesses. One medium may serve a teaching function better than another in a particular area and culture and learners may have different preferences for the technology to best learn with. The socio-economic and cultural background of a person influences their ability to learn from different media technology. Use of new communication technologies requires trained manpower to design, develop, produce and deliver educational material. Few developing countries have adequately trained human resources for these specialised jobs. Among the targeted people they are habituated in a way that providing of education should be done in conventional mode because in some places still people don't have the access to power.

The challenge faced in use of ICT is that in many developing nations the basic requirement of electricity and telephone networks is not available as required. Also many universities do not have proper rooms or buildings so as to accommodate the technology. Another challenge is that the teachers need to develop their own capacity so as to efficiently make use of the different ICTs in different situations. The four most common mistakes in introducing ICTs into teaching-learning are: (a) installing learning technology without reviewing student needs and content availability; (b) imposing technological systems from the top down without involving teachers and students; (c) using inappropriate content from other regions of the world without customizing it appropriately; and (d) producing low quality content that has poor instructional design and is not adapted to the technology in use.

The hindrances affecting ICT in quality education are numerous but some include issues such as:

- Insufficient ICT facilities and unsophisticated accessories
- Epileptic electricity power supply

Insufficient ICT facilities and unsophisticated accessories: In Ethiopia, most ICT facilities are not sufficient to enhance quality education to learners and teachers, even where it exist there are not sophisticated enough to stand the taste of time like the ones acquired in developed countries. Nwosu and Ugbomo (2012) stated that, Problems of quality and lack of resources are compounded by the new realities faced by universities battle to cope with every increasing student's numbers.

Epileptic electricity power supply: In Ethiopia, electricity power supply is irregular this affect most of the ICT operations in her universities and at homes thus causing frequent damages of the existing ICT equipment which hinder ICT uses in enhancing quality education. According to Chandra and Patkar (2007) all ICT equipment, infrastructure and terminals depend on electricity to energize, unless this vital source is always available and reliable, Ethiopians will not be able to fully enjoy the benefits that the digital revolution offers and that overcoming the energy crises is a major pre-requisite for Ethiopia to achieve its Vision of national transformation.

However, others scholars listed the following as hindrances to ICT in quality education; Kwacha (2007) noted that, the most common problems associated with the effective implementation of ICT are lack of qualified ICT personnel, cost of equipment, management attitudes, inconsistent electric power supply, inadequate telephone lines, particularly in rural areas and non inclusion of ICT programmes in teacher's training curricula and at the basic levels of education. Pelgrum (2001) stated that, obstacles for ICT implementation include the following: Insufficient number of computers, teachers' lack of ICT knowledge/skills, difficult to integrate ICT to instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access, not enough supervision staff and lack of technical assistance. In addition, Lewis and Smith (2002) summarized these barriers as limited equipment, inadequate skills, minimal support, time constraints and the teacher's own lack of interest or knowledge about computer.

Since the teaching and learning challenges are multi-faceted, multi-pronged approaches are needed in order to attempt to solve some of these problems. Cross and Adam (2007) postulates:

[...] information technology is a cost-effective investment only in the context of a systemic reform. Unless other simultaneous innovations in pedagogy, curriculum, assessment, and school organization are coupled to the usage of instructional technology, the time and effort expended on implementing these devices produces few improvements in educational outcomes – and reinforces many educators' cynicism about fads based on magical machines.

The researcher infers from Cross and Adam that there are several inter-related factors that influence improvements in educational outcomes. Thus together, pedagogy, curriculum, assessment and organization contribute to bringing about improvements in the educational process. Although educational technology is not the panacea for educational challenges, it does leverage and extend traditional teaching and learning activities in certain circumstances and hence has the potential to impact on learning outcomes. While, Knapper (2001:94) argues that:

[...] technology may be a good solution for some instructional problems, and in some cases it may be a partial solution. But in other instances technology does little to address the fundamental teaching and learning issue or – even worse – provides a glitzy but inappropriate solution to a problem that has simply been misconstrued.

The trick is to identify situations where educational technology will be appropriate and when and how to use educational technology in these situations. There are times where technology may not be useful and may indeed be counter-productive. However, there are many times when educational technology offers a solution for problems that would be difficult, cumbersome or impossible to resolve in a face-to-face environment. Numerous manuals, websites and articles have been devoted to suggesting, explaining and modelling the ways that educational technology can be used to support teaching and learning. The researcher agrees with Czerniewicz, Ravjee & Mlitwa (2005) that it is important that educational technology-based resources be appropriately matched to both teaching and learning activities. Table 1 adapted from Czerniewicz et al., (2005) usefully explains how educational technology can be integrated into the curriculum. Czerniewicz et al guidelines are useful in that they provide a framework which relates ICT-based resources to particular teaching and learning activities. The guidelines therefore suggest particular uses of ICT for particular teaching and learning situations. The effectiveness of ICTs for teaching and learning, however, is largely dependent on how much the context is understood.

4.5 ICT ENHANCING LEARNING ENVIRONMENT

ICT presents an entirely new learning environment for students, thus requiring a different skill set to be successful. Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (Haddad & Draxier, 2002). ICT is changing processes of teaching and learning by adding elements of vitality to learning environments including virtual environments for the purpose. ICT is a potentially powerful tool for offering educational opportunities. It is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by Information and Communication Technologies (ICT).

When looking at the current widespread diffusion and use of ICT in modern societies, especially by the young the so-called digital generation then it should be clear that ICT will affect the complete learning process today and in the future. Authenticity is an important issue which should be addressed in the design and development of learning environments (Cholin, 2005). Learning environments need to reflect the potential uses of knowledge that pupils are expected to master, in order to prevent the acquired knowledge from becoming inert (Chandra & Patkar, 2007). In addition, teachers should stimulate pupils to engage in active knowledge construction. This calls for open-ended learning environments instead of learning environments which focus on a mere transmission of facts (Cholin, 2005). ICT may contribute to creating powerful learning environments in numerous ways.

ICT provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. ICT may also make complex processes easier to understand through simulations that, again, contribute to authentic learning environments. Thus, ICT may function as a facilitator of active learning and higher-order thinking (Law, Pelgrum & Plomg, 2008). The use of ICT may foster co-operative learning and reflection about the content (Nwosu & Ugbomo, 2012). Furthermore, ICT may serve as a tool to curriculum differentiation, providing opportunities for adapting the learning content and tasks to the needs and capabilities of each individual pupil and by providing tailored feedback (Bottino, 2003). As Czerniewicz et al., (2005) point out, ICT may fit into a spectrum of instructional approaches, varying from traditional to innovative. Another aspect which may of course influence the use of ICT is access to technology (Kennewell, Parkinson, & Tanner, 2000). This refers not only to the number of computers, but also to the placement of the equipment, e.g. in the classroom or in a computer room. Kennewell et al. (2000) feel it is essential that computers be placed in the classroom, in order to maximize the opportunities for curriculum activity. ICT environment improves the experience of the students and teachers and to use intensively the learning time for better results. The ICT environment has been developed by using different software and also the extended experience in developing web based and multimedia materials. ICTs have an important role to play in changing and modernizing educational systems and ways of learning.

4.6 ICT ENHANCING LEARNING MOTIVATION

ICTs can enhance the quality of education in several ways, by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs are also transformational tools which, when used appropriately, can promote the shift to a student-centered environment. ICTs, especially computers and Internet technologies, enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. ICT has an impact not only on what students should learn, but it also plays a major role on how the students should learn. Along with a shift of curricula from "content-centered" to "competence-based", the mode of curricula delivery has now shifted from "teacher centered" forms of delivery to "student-centered" forms of delivery. ICT provides- Motivation to Learn. ICTs such as videos, television and multimedia computer software that combine text, sound, and colourful moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become more involved in the lessons being delivered.

ICT changes the characteristics of problems and learning tasks, and hence play an important task as mediator of cognitive development, enhancing the acquisition of generic cognitive competencies as essential for life in our knowledge society. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Law, Pelgrum & Plomg, 2008), the influence of the technology on supporting how students learn will continue to increase. Learning approaches using contemporary ICTs provide many opportunities for

constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (Kennewell, Parkinson, & Tanner, 2000). The teachers could make their lecture more attractive and lively by using multi-media and on the other hand the students were able to capture the lessons taught to them easily. As they found the class very interesting, the teachings also retained in their mind for a longer span which supported them during the time of examination. More so than any other type of ICT, networked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events. ICT-enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember. The World Wide Web (WWW) also provides a virtual international gallery for students' work (Loveless, 2003). ICT can engage and inspire students, and this has been cited as a factor influencing ready adaptors of ICT (Daniels, 2002; Windschitl, 2002).

4.7 ICT ENHANCING THE SCHOLASTIC PERFORMANCE

Based on the extensive usage of ICTs in education the need appeared to unravel the myth that surrounds the use of Information and Communication Technology (ICT) as an aid to teaching and learning, and the impact it has on students' academic performance. ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality. However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICT. The direct link between ICT use and students' academic performance has been the focus of extensive literature during the last two decades. ICT helps students to their learning by improving the communication between them and the instructors (Flecknoe, 2002; Sharma, 2003).

The analysis of the effects of the methodological and technological innovations on the students' attitude towards the learning process and on students' performance seems to be evolving towards a consensus, according to which an appropriate use of digital technologies in education can have significant positive effects both on students' attitude and their achievement. Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century. Kozma's (2005) meta-analysis study revealed that, on average, students who used ICT-based instruction scored higher than students without computers. The students also learned more in less time and liked their classes more when ICT-based instruction was included. Fuchs and Woessman (2004) used international data from the Programme for International Student Assessment (PISA), they showed that while the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive, the correlation becomes small and insignificant when other student environment characteristics are taken into consideration. Becker (2000) found that ICT increases student engagement, which leads to an increased amount of time students spend working outside class. Coates et al. (2004) showed that students in on-campus courses usually score better than their online counterparts, but this difference is not significant here. ICTs especially computers and Internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way.

5. CONCLUSIONS AND RECOMMENDATIONS

In order to conclude the researcher was try to proceed to synthesize from a general viewpoint the results obtained, taking into consideration the relevant aspects of the literature. The results provided by analysis of the literature obtained were exposed especially regarding those aspects which are related to ICTs for Education and ICTs in enhancing quality education at universities. ICTs for quality education refer to the development of information and communications technology specifically for teaching-learning purposes, while the ICTs in education involve the adoption of general components of information and communication technologies in the teaching learning process.

5.1 CONCLUSIONS

This literature review has sought to explore the role of ICT in enhancing quality education at university as we progress into the 21st century. In particular ICTs have impacted on educational practice in education to date in quite small ways but that the impact will grow considerably in years to come and that ICT will become a strong agent for change among many educational practices. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on: ICT and teaching-learning process; quality and accessibility of education; learning motivation, learning environment and ICT usage and academic performance.

As move into the 21st century, many factors are bringing strong forces to bear on the adoption of ICTs in education and contemporary trends suggest will soon see large scale changes in the way education is planned and delivered as a consequence of the opportunities and affordances of ICT. It is believed that the use of ICT in education can increase access to learning opportunities. It can help to enhance the quality of education with advanced teaching methods, improve learning outcomes and enable reform or better management of education systems. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on: What is learned, how it is learned, when and where learning takes place, and who is learning and who is teaching. The continued and increased use of ICTs in education in years to come, will serve to increase the temporal and geographical opportunities that are currently experienced. The integration of ICTs in university is inevitable. The very high demand for university has stimulated significant growth in both private and public provision. ICTs in the form of Management Information Systems are increasingly universal. The strength of computers in teaching is their power to manipulate words and symbols-which is at the heart of the academic endeavour. The use of ICT creates an open environment which enables the storage and the reuse of information materials as also it enables the interface among the teachers as well as students. Apart from having enabling telecommunications and ICT policies, governments and universities will need to develop strategies for effective ICT and media deployment and sustainability.

The adoption and use of ICTs in education have a positive impact on teaching, learning and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that students can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching-learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for students and teachers. These possibilities can have an impact on student performance and achievement. Similarly wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching and improved academic achievement of students. The overall literature suggests that successful ICT integration in education.

It is imperative and equally inevitable to say that quality ICT tools are a prerequisite to quality ICT education. Therefore quality ICT facilities should be made available, accessible and equally made easy for teachers and students to obtain in order to have quality ICT education in Ethiopian universities. It is nice to say that ICT is a tool that enhances quality education for transformation of individual which in turn help, to boost national economy. Therefore, issues and challenges of ICTs in education should be given urgent/adequate attention in the national assembly and bill should be passed on the effective use of sophisticated ICT gadgets with ICT experts monitoring these equipments. These sophisticated ICT gadgets could stand in test of time be equipment tested and trusted for durability and reliability provided electricity supply is stable and not erratic.

The rigid use of textbook material and its high complexity and great diversity of content does not motivate students, as it imposes great difficulties on them in the understanding of concepts and how to relate the topics being studied with real applications. The findings showed that students prefer the flexibility in the learning process through ICT-based education.

In areas with a continuous change of technological content, as with information and communication technologies, the problem is the difficulty in selecting and organizing the knowledge to be taught. In terms of technical support, experts, and course materials ICT-based education system is expected to enhance its capability to satisfy the user groups. On the one hand, new knowledge has to be added to the curriculum constantly, and at the same time any other knowledge becomes obsolete. On the other hand, content has to be organized and ordered, relating every concept to others, which is not a trivial task because of their number and how often they change.

The ICT-based education system is a holistic approach where a very high level of integrity and moral standard is required by instructors, ICTs experts, students and other stakeholders. To be effective everyone concerned with the process has to upgrade themselves continuously to keep pace with the ever changing environment. Just copying strategies from advanced world will not serve the purpose of harnessing university. While implementing ICT-based education program we have to consider indigenous factors that affect the effectiveness of the operation.

5.2 RECOMMENDATIONS

The ICT enhancement of quality education among Ethiopian universities requires that the following recommendations first be implemented:

1. The current ICT policy framework must be reviewed to reposition it to function as a necessary tool for the development of universities. The focal point of this revised policy should be the availability, acceptability and accessibility of ICT facilities in the management of university education.
2. The adoption of ICT international standards and its inclusion in the Ethiopian education system. Continuous training and retraining of teachers, others supporting staff and academia on computers and ICT skill acquisition should be provided.
3. A regular supply of power must be made available to all universities irrespective of their locations. Optimal gains cannot be achieved in the use of ICT tools where the power supply is sporadic at best.
4. Development and training of ICT experts, specifically for instruction design and development, who will work in partnership with educators and teachers should be assigned by university.
5. The private sector and multinationals within the country must begin to collaborate with government and universities in the provision and maintenance of ICT facilities. These actors/stakeholders should also consider undertaking training administrators and teachers in the effective use of ICT facilities.

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