International Journal of Academic Research in Library & Information Science
Vol. 2, Issue 1 - 2019

THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY IN [ICT] IN ZAMBIAN EDUCATION SYSTEM

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ABSTRACT

This article defines information and Communication Technology (ICT), the types of ICT Resources and the Application of ICT in education Zambian Educational system. Moreover, problems of ICT application in Zambian educational system are discussed in the article. Strategies for strengthening ICT usage in Zambian Schools are also highlighted. Descriptive research provides information about conditions, situations, and events that occur in the present. For example, a survey of the impact of ICT on Zambian educational system is provided in this article in order to establish a descriptive profile of the facilities that exist in a typical school.

WHAT IS INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)?

As a result of globalization the rate of interdependency among nations of the world has increased tremendously. Such interdependency is facilitated by Information and Communication Technology which has transformed the entire universe into a global village.

TYPES OF ICT RESOURCES

ICT involves the use of combination of technologies in generating information. These technologies could be referred to as ICT resources, some of which are explained as follows:

COMPUTER

It is an electronic machine designed to process information. Computers perform complex tasks that can take human beings a life time to accomplish. Some of the qualities of computers include speed of computation and retrieval of information, accuracy of computation and transfer of information, storage capability and automatic processing. The computer based information system has four phases of activity named input, processing, output and storage. In the input phase, data are captured and converted to a form that can be processed by a computer. The processing phase deals with manipulation and conversion of data into an appropriate form of information. In the output phase, necessary information are provided for use while in the storage phase, processed data are stored in usable form.

ELECTRONIC MAIL (E-MAIL)

This refers to the process of sending, storing and receiving massage electronically through the computer system. The use of email was developed in the 1960's. E-mail is a faster, cheaper and safer form of sending mails across the globe. It enables the user to send electronic message or document through the computer system to a specific e-mail address.

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E-mail is faster as messages can be exchanged in few seconds or minutes unlike using postal mail which may take days, weeks or months. E-mail can be used to send audio, video and text messages. E-mail message usually contain a header that specifies the sender, recipient and subject, followed by a body that contains the text of the message. A person must have a mail box containing e-mail address before he/she can send or receive e-mail messages. Through e-mail, it is possible to communicate a message many people at the same time. This is done through a mail exploder program which forwards a copy of the message to each member on the list at the same time.

INTERNET

It is a large network of interconnected computers that make communication and cooperation easy. It is a collection of interconnected computer networks, linked by copper wires, fiber-optic cables, wireless connections among others. It is characterized by the use of Internet protocol, network connectivity and public telecommunication system to securely share information. Internet comprises multitude of interconnected network of computers spread all over the world linked together by some links called protocols. Through the Internet, the world has been turned to a global village where information can easily be disseminated, people can easily be connected and business transactions can easily be made.

WORLD WIDE WEB (WWW)

It is a global, interactive, graphical information system that is used over the Internet. It contains digitized data stored in files called WEB PAGES. It is simply called web. www is a collection of interconnecting documents and other resources linked by hyperlinks and Universal Resources Location (URL). It can only be accessed on the Internet and can be used to provide information on every facet of life. At the school set up, it is used for online admission and registration of students, payment of school fees and checking of examination results. Various individuals, organizations and governments use this Internet technology with such descriptions as www.un.tlm.ng; www.ubad.edu.ng; www.teni.com among others as their website addresses.

ELECTRONIC NOTICE BOARDS

These involve the use of communication software to allow personal computers to act as public address systems. Electronic notice boards are created to link people who have the same interest for the purpose of information dissemination from time to time.

TELECONFERENCING

This refers to a process whereby people conduct real-time discussion on the Internet. Each participant will type his or her contribution to any discussion topic on the Internet and also read other people's contributions to the discussion. This is made possible with the Internet relay chat. Each participant in the discussion group can enter and leave the discussion when he or she likes.

TELEPHONE

This is a communication device through which a conversation could be held with another person at an entirely different location from that of the initiator of the conversation. Talks are held with people far and near with the aid of telephones. GSM phones enable the users to send audio, video and text messages easily to one another within few seconds.

CLOSE CIRCUIT TELEVISION

It is a television distribution system in which the sender and the receiver are physically linked by wire. It does not operate through the airwaves. It may be between a single camera and a receiver within the same room for image magnification. It may also be a link between a studio and several locations. It has the advantages of privacy multi-

channel capacity and freedom of being set up by any one or organization channel capacity. It is used by law enforcement agencies for crime prevention and control. Commercial banks and other corporate organizations also use close circuit television to monitor people's activities in their premises for the purpose of crime prevention and control. It is also used in some tertiary institutions for teaching special elective courses.

CABLE TELEVISION

This is the dissemination of television programmes by wire into homes and institutions. A favourably situated high mast antenna captures signals of the television. In the alternative, a capable company can originate its own channel live or from tape of film. Cable television facilitates people's access to high quality channels as fiber optics make it theoretically possible to transmit 1,000 channels per cable, and such channels can be encoded and made available on rented decoders. The broadcast of cable television is restricted to subscribers only.

APPLICATION OF ICT IN EDUCATION

The significance of ICT in education cannot be overemphasized. It facilitates the development of education in various ways as discussed below:

IT AIDS EFFECTIVE TEACHING AND LEARNING

It assists the teachers to take students beyond classroom limits by creating virtual environments to experiment and explore. Effective instructional delivery by the teachers is guaranteed as ICT assists them with effective and efficient tools to take care of the individual differences of the students. Moreover, it provides teachers opportunities for cooperation with colleagues through networking and Internet services. This will facilitate cross-fertilization of ideas and improve the teaching skills of the teachers. With the Internet, it is possible to access learning materials anywhere in the world. Moreover, the use of educational application software assists the students to work easily, make their writing easier and make them learn faster. ICT offers educational resources such as software packages and web pages, which present a fresh opportunity for teachers and students to maximize their efforts in acquisition of new skills. The self learning capabilities of ICT in education also assist the students in their mastery of school subjects. Through the use of ICT, teaching and learning have been freed from the constraints of linear curriculum. The use of ICT has made teachers become facilitators and managers rather than dispensers of knowledge in the learning process. Computer Aided Instruction (CAI) facilitates learning through drills and practice, tutorials, simulation and games.

ENRICHMENT OF CURRICULUM CONTENTS

Curriculum contents are enriched as teachers and curriculum experts are able to get curricular materials from the Internet. These include information, messages, skills, strategies and relevant school practices not yet known by students and teachers and which cannot be found in recommended school textbooks. Such materials can easily be downloaded for the information and academic development of students. The contents of topics taught in the classroom can be improved through recent research findings in obtained through the Internet. School curriculum is also enriched through the satellite microwave, cable and broadcast television which give students access to courses that are not available in their schools. The Internet resources in education also aid both the individual and professional development of the teachers thereby making it easy for them to implement the school curriculum effectively.

IT INCREASES ACCESS TO EDUCATION

It is obvious that the formal school system can no longer meet the ever growing demand for

education. This has made e-learning the best option for a lot of people in order to have education.

There are various e-learning undergraduate and postgraduate programmes which offer many of these applicants the opportunity to access university education. The e-learning has the capacity to reach many learners of course with quality education. E-learning provides the learners interactive information and learning opportunities at a time, place and form appropriate and convenient for them.

IT IMPROVES STANDARD AND QUALITY OF HIGHER EDUCATION

The quality of higher education is improved through the virtual library project. The project which is ICT based improves the quality of teaching, research and consultancy in higher institutions. Through the virtual library project, members of the academic community have access to current books, journals and information resources held by global network of on-line libraries. Such access promotes scholarship, research and lifelong learning.

Colleges and universities in the nation are encouraged by their quality assurance agencies to be part of the virtual library project. Moreover, the introduction of Management Information System [MIS] has improved the quality of tertiary education. For instance, MIS has assisted Zambian universities and colleges in decision-making for effective administration by providing the required data for making good decisions. Furthermore, the administration of students' personnel services in tertiary institutions is made easier as many learning institutions in Zambia now conduct on-line screening and registration of students and place students results on the Internet for them to check.

IT IMPROVES THE TEACHING PROFESSION

The integration of ICT in teachers' training programmes will improve the teaching profession. In realization of the potentials of ICT for improvement of the teaching profession, the Teaching Council of Zambia [TCZ] should dedicate ICT skills acquisition, summits and campaigning aimed at preparing teachers in Zambia to maximize the advantages of the professional development on the web. Teachers who are ICT compliant are uplifting the teaching profession as they inculcate ICT skills in their students.

IT IMPROVES THE QUALITY OF UNIVERSITY GRADUATES

There has been apprehension about the quality of graduates from Zambian universities when compared to other developed countries of the world. Through ICT exposure, the quality of graduates from our university has improved as many of them are now kept abreast of developments worldwide. Apart from the fact that this has improved their skills, it has widened their interaction with individuals and corporate organizations across the globe. Unlike before, many graduates now have access to employment, investment and admission opportunities worldwide through the Internet. Through such access, some graduates have secured jobs and admission for further studies in foreign countries while some have entered into partnership business with foreigners.

IT AIDS EFFECTIVE MANAGEMENT OF THE SCHOOL SYSTEM

The tasks of managing the school system involve activities such as planning, organizing, coordinating, supervision, provision of educational support services, budgeting among others. All these activities require large volume of information for decision making. This information is easily provided by ICT. Many schools now make use of ICT facilities in registration of students, maintenance of staff and students' records, keeping of inventory list of supplies, drawing of architectural design keeping of financial records,

payment of salaries among others. This makes the management of the school system easier and effective as information are easily stored and retrieved for making good decisions.

IT AIDS EVALUATION OF LEARNERS

Some of the evaluation functions of the teacher have been taken over by some computer programmes. These functions include generating and administering tests, grading and reporting, summarizing the results and providing feedback on results. The use of appropriate programmes and the scanner has now made it possible to scan, score and produce the results of multiple choice tests written by several students in just few minutes or hours, instead of several weeks of manual marking.

PROBLEMS OF ICT APPLICATION IN ZAMBIAN EDUCATIONAL SYSTEM

The application of ICT in Zambian educational system is confronted with various problems as discussed below:

PROBLEM OF TEACHING PERSONNEL

Trained teachers in computer science who are to teach students the practical aspects of the subject are grossly inadequate in Zambian schools. Many teachers distance themselves from computer-related activities due to fears, ignorance, negative perceptions or inferiority complex. Many teachers who are trained in computer science do not have access to computers either due to unaffordability of them or they feel it is not necessary. At the tertiary institutions, many lecturers are not competent in using ICT facilities for instructional delivery due to lack of training or apathy to the use of such facilities. All these affect the acquisition of ICT skills by students at various levels of our educational system. If the teachers who are to impart the skills and knowledge of ICT to the students are not trained and motivated, the rate of ICT illiteracy among the students will continue to increase.

INADEQUATE FUNDING

Due to inadequate funding of education in Zambia, ICT facilities are not ready available in schools. A lot of schools do not have computers, where they are available; they are grossly inadequate to serve all the students. The ratio of students per computer is very high and the level of Internet connectivity is equally low. Many lecturers and students in tertiary institutions do not have access to adequate Internet, facilities on campuses but have to partronise business centres outside their institutions. The high cost and maintenance of ICT facilities coupled with shortage of funds to procure the facilities impede the acquisition of ICT skills by teachers and students in Zambian schools.

POOR POWER SUPPLY

The effective functioning of ICT facilities depend on stable supply of electricity. There is epileptic supply of electricity in Zambian rural areas by Zambia Electricity Supply Cooperation [ZESCO]. Interrupted electricity supply in urban areas inhibits the usage of ICT. Schools and business centres which operate Internet facilities in the country depend heavily on electric generators. This makes the cost of maintaining such facilities exorbitant and consequently limits people's access to them. The safety and longevity of computer hardware and other electronic gadgets being used to aid instructional delivery cannot be guaranteed in an atmosphere of unstable supply of electricity.

LOW TELE-DENSITY

The access of Zambians to telecommunication facilities such as computer and Internet is still low in rural areas. Although, the introduction and infusion of GSM telecommunication technology has increased the access, it is still far below what is required to ensure mass utilization of ICT

facilities for educational purposes. Zambia has the one of the least telecommunication in Africa with a subscriber base of 10 million and teledensity of less than 15% while Canada with a much smaller population has a tele-density of 107%.

LOW LEVEL OF INTERNET CONNECTIVITY

There is low level of Internet connectivity in Zambia. We still utilize thin band-with, non-existing intra-regional connectivity and inefficient fixed lines inhibited by inter-exchange congestion. We depend on VSAT for our Internet connectivity, which has a much lower quantity and more expensive than land-based connection. Moreover, there are few Internet service providers in the country and they charge high fees that may not be easily affordable to many people.

HIGH LEVEL OF POVERTY

Due to high level of poverty in Zambia, the cost for ICT facilities is not affordable to many people. As many as people are willing to buy computer hardware and software, their exorbitant prices coupled with the parlous state of the economy make them unable to buy them. Those who can afford them find the maintenance costly. This is because electric generators remain the alternative source of energy in view of the epileptic supply of electricity by ZESCO in the country.

SHORTAGE OF BASIC INFRASTRUCTURES

Basic infrastructures such as classrooms, furniture, books, laboratories and air conditioners required for effective functioning of ICT facilities are not adequate in Zambian schools. This inadequacy limits students' access to Internet and other ICT facilities. There are instances where computers are donated to schools but could not be used because of inadequate basic infrastructures for their operation. Some schools that strive to maintain ICT facilities amid inadequate infrastructures only end up closing shop not quite long because of breakdown of such facilities.

DEARTH OF TECHNICAL SUPPORT STAFF

The installation, operation, maintenance and network administration of ICT facilities need to be handled by ICT technicians and personnel. It has been observed that there is shortage of ICT technicians and personnel in Zambia. This does not make the country responsive enough to the ever growing challenges of ICT in the global arena.

STRATEGIES FOR STRENGTHENING ICT USAGE IN ZAMBIAN

Schools In view of the significant impact of ICT on educational development, the following strategies are suggested for strengthening its usage in Zambian schools.

TRAINING OF TEACHING PERSONNEL

There should be mass training of teachers in ICT. This can be done through an ICT based teacher training programmes in Colleges of Education, Universities and allied institutions.

INCREASED FUNDING OF EDUCATION

Our governments should commit more funds to education so that ICT facilities will be made available in all schools. The allocation of funds to education over the years is still less than 15 percent. This proportion is still far from the UNESCO recommendation of 26 percent. The government should strive to meet the UNESCO standard in its funding on education in order to empower our schools in the provision of ICT facilities. State and local governments, voluntary agencies, corporate bodies philanthropists and private individuals should also be encouraged to increase their financial commitment to education so that more ICT facilities can be provided in schools.

REGULAR SUPPLY OF ELECTRICITY

Our governments should be more aggressive in providing uninterrupted electricity to all parts of the country. This will facilitate the mass usage of ICT facilities both within and outside the schools.

INCREASE IN TELE-DENSITY

There should be collaborative efforts by stakeholders such as governments, Internet service providers, corporate bodies locally and internationally, telecommunication industry among others in increasing the access to Internet facilities in the country. Such efforts should also geared towards ensuring mass utilization of ICT facilities for educational purposes.

POVERTY ALLEVIATION

Governments at various levels should be more aggressive in pursuing policies and programmes that can effectively alleviate poverty among Zambians. Priority attention should be given to provision of mass employment, income re-distribution, and provision of infrastructures, good health services, and diversification of the economy among others. This will reduce the poverty level of the masses and many of them shall be able to afford the cost of computer hardware and soft ware and other ICT facilities.

PROVISION OF MORE BASIC INFRASTRUCTURES IN SCHOOLS

More basic infrastructures such as classrooms, furniture, books, laboratories, air conditioners among others, which are required for effective functioning of ICT facilities, should be provided in schools. This can be done through increased funding of education by the governments and other stakeholders.

TRAINING OF MORE TECHNICAL SUPPORT STAFF

Government should embark on mass training of ICT technicians, course developers and personnel who will handle the installation, operation, and maintenance and network administration of ICT facilities. This will place the country in a better position to compete favourably in the ICT world.

CONCLUSIONS

For Zambia to be able to meet the global challenges of educational development, it must fully integrate the application of ICT into its educational system. This can be done through a holistic approach to solving the myriads of problems, which militate against the mass utilization of ICT resources in our school system.

