# RELEVANCE OF INFORMATION COMMUNICATION TECHNOLOGY TO SCIENCE AND TECHNOLOGY EDUCATION

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## Abstract

This paper examines the importance of information technology in the teaching and learning of Science. Information technology facilitates the teaching and learning process by reducing stress worry and anxiety in the classroom. In addition, information technology has been found to develop learner's skills and potential ability as it brings about the in depth understanding, of difficult concepts particularly in Science and technological education. It also enhances learner's ability not to think effectively and logically alone but also to acquire and utilize knowledge available thee in for the development of science and technology in our nations.

## Introduction

The change that brought about new techniques has a significant effect on the way people live, work, play transact business and disseminate information.

Information technology provides greater access to information, ideas, knowledge to a vast array of data, assimilation of the learners and their assessment skills.

The introduction of information technology into the educational system will help both the learners and teachers to find the individual activities of the learners helpful and motivate them.

The multimedia attribute of system application will make the teaching of science particularly, more easy to demonstrate complex concepts and this enables the learners to proceed at their own pace and free from the pressure of peers. A good example of this type of system can be found in countries such as Australia, Singapore, Israel and New Zealand where this is being practiced extensively.

The connection of the internet for example gives the learners opportunities of brining the real world into the classroom more vividly and powerfully than never before.

In classroom traditional setting, teaching and text books are sole sources of dealing with educating large classes and the classroom is physically and figuratively isolated from the real world in network classroom (Watson 1996).

Information technology has taken a new tune in the present decade as professionals witnessed a movement from single unit computer used to the creation of local area network (LAN) to wide area network (WAN) and now the internet.

An assessment of the situation in most science classroom in Nigeria today would reveal that the pace of the class is determined by that of the brightest student. The situation would be such that the dull ones would not be able to cope. It would be seen that despite the fact that self learning text was of the same materials used for teaching problems solving techniques by the teacher. Learners who were taught by the teacher performed better in past test. This must be due to the fact that many of our learners do not enjoy reading especially at secondary school level. Apparently they have poor reading culture at this level.

One of the solutions to this problem could be found in the introduction of computer into our schools.

The introduction of computer into the learning process would be an added advantage to both the learners and teachers in our educational system.

The world is a global village, and development is growing at a faster rate, and to reduce the stress of large class to attend to by our teachers at various levels of our educational system, there should evolve a system that will cater for individualized studies which could only be found in information technology.

In recent times, there has been an explosion in the information technology industry. This has resulted in the widespread use of computer all over the world in the private and public sector, in government, in industries, entertainment, homes and education.

Technology refers to the physical mechanical or electronic capabilities that determine a medium is function.

Education involves basically teaching and learning. All programmes of Education can only be successful with adequate, reasonable, availability; proper selection and utilization of educational equipment, facilities and supplies. All learners must be, able to participate fully in educational activities.

In Nigeria, the policy of educational lay emphasis on functional education although appropriate development of cognitive, affective and psychomotor skills in pupils/learners as bases for development and self reliance (Ivowy 2002).

To this effect one of broad educational objectives is the training of the mind in the understanding of the worlds around them; acquisition of appropriate skills, abilities and competences both mental and physical as equipments for individual to live in and contribute to the development of the society (Fint 1978)

Teaching and learning today is being revolutionized. It is not simply a passive response to instruction's "delivery" rather it is an active, constructive, cognitive and social process by which the leaner strategically manages available cognitive, physical and social resources to crate new knowledge by interacting and intergrading it with information stored in memory.

**Types of Learning Media**

**(1) Learning with books (prints)**

The most common medium encountered in school learning is still the book. As a learning medium, the book can be characterized by the primary feature of its technology (that is stability), by its symbol systems (printed text) pictures and graphics, and by the way it influences specific, process (reading). Prints include – books. Newspaper, journals, magazines, pamphlets. Handouts etc.

In general reading progresses in forward direction and at a regular rate as the reader moves along readily constructing a mental representation that relates the information in the text to an, existing process, interact with prior knowledge and skill in a way that relies heavily on the stability of text to aid comprehension and learning. While poor readers are often thwarted by the effort required to decode the text; fluent readers use the stability of the text to avoid reading failure.

**(2) Learning with Radio (Audio)**

Radio is an instructional educational material that can be used for transmitting audio (sounds) messages to the leaner/people even in far and near at the same time.

Radio can be used in various ways to stimulates learning among learners at various levels.

With the use of radio learners can have the opportunity to construct mental pictures of events and this broaden their imagination

Radio makes subjects interesting with the introduction of music and different progamme techniques.

It helps to give accurate information such as recent, past occurrences and invention. It also helps to reinforce the information the student might have gathered from the teacher in the class.

**(3) Learning with Television (Audio Visual)**

Television or video tapes such VCD, VHS, or any video medium differs from books in several way that may affect cognitive, structures and processes. The technology of these media makes both their verbal and visual symbol systems transient rather than stable. Because of this transient nature the two symbol system are presented simultaneously. Learners may process the information in video media very differently from the ways they process similar information in books, radio. It is also possible that the symbol system and their transient nature affect the mental representations that learners create.

Audio visual media aids learning in that audio and visual presentation show that combined use of the two symbol systems results in more recall than visual only and audio only.

Audio visual resources are those that appeal to our senses of hearing and seeing. This media combines the effect of both seeing and learning in the teaching and learning and has a unique importance of recreating the past and bringing the distance place and events to the classroom

**(4) Learning with Computers**

Computers can be distinguished from the two previous format by what they can do with information, that is, by their ability to process symbols and symbol system.

Computers can transform information in one- symbol system to that in another and they can procedurelize information. In its transforming function, a computer with a voice synthesize can change typed text (i.e. Print) into speech, using integrated software package. It can transform numerical values into charts and graphics.

Learners are frequently unable to connect their symbolic learning in school to “real world” situation, but the transformational capabilities of the computer can help them make this connection. The attributes of the computer include storage and processing of information. The computer has memory for storing and processing data.

Adewunmi (1981) defined computer as an integrated system of man, machine and procedures developed for the purpose of collecting, processing and analyzing data to supply information. Computer can make available all the information needed for all types of decision and at all levels in the educational system. It makes information accessible, accurate, comprehensive, appropriately clear, flexible, veritable and free from bias and quantifiable.

For the teacher, the computer is an able companion and helper; because in communication channel, teachers are the transmitters while the learners are the receivers. Using the computer programmed instruction, the teacher can teach as many students/learners as possible without overworking himself/herself. This takes care of the scarcity of qualified teachers particularly in the technological and science education.

Computer assisted learning programmes help to take care of all categories of learners. It provides individualized instruction and can be used with large number of students/learners of varied locations and background.

Computer helps to solve teachers constituted problems hindering successful learning such as the teacher’s inability to teach difficult topics.

The computer develops learning by discovering in learners new skills and this can go a long way in raising future scientist, engineer and technologist for our nation’s development.

Computer as a medium of instruction not only facilitates the movement of information from teacher to learners, it is also used to store lesson materials and student response.

**Learning on the Internet**

Over the years, man has been making effort to improve the means of communication. The major advances made in this area so far are in information technology. Before the introduction of information technology, the media through which information flowed from individuals and groups of scientists and techno gist – engaged in research and development in the area of communication were through letters, journals, the telephone, telex telegram and fax.

Today, the internet now links many millions of computers worldwide. Subsequent research led to the introduction of networking in the form of several varieties such as local area network (LAN), wide area network (WAN), Regional area network (RAN). These networks facilitated the sharing of resources that were hardware (Okon 1999:137).

Internet is a system, in which computer are connected so that they can share information. On Internet it is possible to send a list of things over, lines of electronic communication. They could be in form of letters, which are called 'E-mails, reports, magazine, articles, news and books that are called music on the internet. Internet allows one to locate and retrieve information on other computer linked to it, as well as send messages electronically.

**Internet** is emerging as sources of learning resource. It is often regarded as the virtual classroom because it allows for global distant learning programme. Millions of students/learners at different levels of one educational system could be linked through the internet to their counterparts worldwide.

With internet access, learners have an unprecedented opportunity to met people and learn from them.

They have access to document that will assist them to solve problems and answer difficult questions particularly in the sciences.

**Learning with Multi Media**

Little research has been done on learning with multimedia environments./ However, multimedia presents the possibility of combing in single instructional environment many media at the same time.

Media is a collection of materials and equipments that are for communication or transmission of information between persons.

Media according to lyag-Abion (199=88) is derived from Latin word " Media" which means between Media refers to various means through which message can be produced, stored, transmitted, retrieved, amplified, reproduced, recalled or carried between the source (teacher) and the receiver ( Learners).

Many media has been discovered toady for effective teaching at school levels to enhance good performance and unenviable behaviour expected from the students.

Many researcher or authors of different books have pointed out the reason for using media in the classroom situation. More K.D. (1989). Inyand Abioa (1988), Iseyemi, A.A. (199() makes contribution to the importance of media towards learning.

It is good to know that the human element in all educational processes is primary while the technical element in almost all cases is secondary.

New technologies and new techniques engendered by the Information and Communication Revolution now allow for the production and saucing of new knowledge and the dissemination of data

Information technology includes the internet, the web, CD-Rom(computer Disk Read – Only memory), printed, audio-visual and other electronic media forms.

These new technologies allow teachers and lecturer into the role of guides and facilitators assisting students/learners to gain the skill required to acquire and utilize knowledge available in various forms all over the world.

**Recommendations**

Due to the relevance of Information communication Technology, it is recommended that;

- the government act different levels should provide information communication technology equipments to all secondary school in the country
- teachers should be trained on the effective utilization of modern technologies to assist teaching and learning
  information communication technology should be taken as a compulsory course in all teacher training institutions in the country.
- competent hands should be recruited for the serving and maintenance of the available ICT equipments so that they an be used for a relatively long period of time.
- software's should be designed in local languages of the various users so that they can easily understand the content without any interpreter.

**Conclusion**

The importance of information technology to the teaching and learning process for the development of science and technology cannot be over emphasized.

Most of our educational institutions do not have most of the media that enhance better understanding of the subject. In particular, the Public Educational Institution are the most hit.

From primary to tertiary level of Education, Computer are still very much out of the reach of learners. The Federal Government Initiative of a computer to a child project should not be allowed to die. Since information technology influences the performances of learners in our educational system particularly science and technology for example the use of models of atom generated tin the media facilities the teaching and learning of organic chemistry and better in-depth understanding of the subject.

Information technology saves time when used in the classroom environment. It enhances learners thinking logically and effectively

Apart from the advantages of complementing the role of a teacher, information technology stimulates learners to learn better and faster. Internet for example helps learners gather useful information not only in science and technology but in virtually all subject areas. Internet remains the best source of educational information and some gadgets like radio, T.V. Video, Cassette recorder when used in the classroom facilitates the understanding of difficult concepts.

And lastly from the experience of most developed or developing nations of the world, there is no doubt that information technology and the use of computer I an appropriate technique for increasing access to and improving the quality and reducing the cost of education.

The appropriate use of computer and associated devices in the classroom is of critical importance when the system is correctly deployed and the programs properly written, they not only satisfy the needs of the learners but can go a long way in solving science and technology problems

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