

# **ICT AS A CATALYST IN HIGHER LEARNING FOR INNOVATIVE DEVELOPMENT**

**BY**

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## **ABSTRACT:**

Information communication technology keeps abreast of passing information from source to destination. It involves acquisition, processing, storage and dissemination of local, pictorial and numerical information by a microelectronic based combination. ICT facilities will keep students to conveniently carry out science practical and experiments on the screen and receive learning interaction with simulation. ICT has been described as the scientific tool and techniques for developing, documenting communicating information as and when needed. The paper concludes that ICT has been describe as the scientific tool and techniques for developing, documenting communication information as and when needed especially as they concern solving problems or providing services in various arears of human endeavors. Some of the recommendations among others are that for ICT to be used there must be power supply, there must be human, machine and program to work together to achieve a targeted goal.

**Keywords:** Online learning, constructivism, higher education

## **INTRODUCTION**

Information communication technology (ICT) means the use of computer system and telecommunication equipment in information processing. It is made up of three basic components namely which are electronic processing using computer, transmission of information using communication equipment and dissemination of information in multimedia (Okwuanaso 2007). In short, ICT can simply be defined as the acquisition, processing, storage and dissemination of vocal, pictorial and numerical information by a microelectronic-based combination of computer and telecommunication (Ayo 2004). Information and data flow from source to destination are made possible by signals. It is the changing of this data and information to signals to send to and fro that is the information communication technology. It involves three bodies: the sender of the information, the machine transmitting the information into signals and the receiver of the information being sent. If the information has to travel a little distance from the source the receiver must have similar gadgets with that of the source(sender) so that the signal will be transmitted back to recordable form for the receiver to see (Aguboshim Felix

2017). ICT is made up of three basic components namely: computer, telecommunication and internet (Aguboshim 2016). Computer can be defined as any electronic machine capable of accepting data as an input, process the data and give out the result of the processed data as an input, the output is the information that guide the user for decision taking (Aguboshim 2016). Computer can be used for the following: Direct storage and retrieval of data, typing in data, formation, editing, scanning, e-mail and printing. The computer is important for inter connection. Other uses of computer in business organization are: typesetting of text from draft, letters, magazines and newspapers. It is also used for correcting errors and editing texts.

### **TELECOMMUNICATION**

Telecommunication is a vital engine of any economy: it is an essential infrastructure that promotes the development of other sectors. According to (Ohakwe 2002), Citing business times (2001) listed the telecommunications service to be offered in Nigeria as telephone, cellular mobile telephone, radio and television. Business services, computer networking internet service etc.

### **INTERNET**

Internet is the internal network of connecting millions of computers all over the world in order for them to share their resources (Umendu 2010). It is the global information pool that links hundreds of nations, millions of industries and companies. In many parts of the world, the internet is indispensable tool for business, research, commerce, communication and technological development. This is because it allows worldwide community to communicate over any distance to access information from anywhere in the world thereby turning the world into a global village.

### **THE IMPACT OF ICT IN SCIENCE EDUCATION FOR SUSTAINABLE NATION**

Science is a body of knowledge comprising of ideas, skills information about the world, nature and man (Ango 1990). It is an attitude of inquiry, observation and reasoning with respect to the world. It is developed through practice observation and reasoning. Science education aims at producing scientifically literate (Oguniyi 1985). To achieve these objectives of science teaching, with respect to the changing needs of the society, ICT should be employed. Communication is very important in teaching and learning process. In education, communication is used as an interaction to influence or change the behavior of the learner in the desired direction. The teacher at the end feels satisfied that he/she has put across the information to the learning in such a way that the learner has acquired it, and is able to use it effectively to solve problems and achieve societal objectives expected of communication in teaching and learning of science has to be done in a way that the learner acquires the necessary skills and learn the stipulated concepts without unnecessary barriers. To achieve this, ICT is the answer to science teaching and learning.

## **METHOD OF TEACHING SCIENCE COURSES FOR SUSTAINABLE NATION**

The aim of science education is to help the learners develop scientific attitudes, knowledge and skills regarding the order in nature. In order to achieve this, science teachers should use approaches that will encourage learners to see learning as a process of constructing science teachers with regard to using appropriate equipment and apparatus that encourages teaching and learning science courses.

Science teachers should employ problem solving approach to the teaching of science courses. Computerizing our education system would expose teachers to the use of these innovative teaching approaches. This will enhance learning of the various science courses.

ICT facilities will help students to conveniently carry out science practical and experiments on the screen while receiving learning interaction with stimulations. Expensive and risky laboratory experiments could be carried out by using ICT through the remote laboratory arrangement. ICT will enhance collection of data through the internet from external sources. Also, formulation of hypotheses, predicting phenomena, testing hypotheses and model could easily be carried out using ICT facilities. ICT compliant teachers will enjoy their lesson with their students as long as the equipment are there and there is power for the equipment.

## **RE-TRAINING OF SCIENCE TEACHERS FOR SUSTAINABLE NATION**

For effective use of ICT in teaching and learning of science courses, Science teachers must be computer literate (ability to operate the computer). Most people think that with the introduction of computers, that services of teachers will not be needed. This is a great misconception. Science teachers are needed to apply their expertise in choosing the curriculum tasks, organizing interactions with the students during lessons, mentoring the learning progression as well as remote discussion and reflection among students and also access the students. In order to be able to do these, science teachers need to be retrained in the use of ICT for course delivery, and in multimedia based course development and training.

## **DEVELOPMENT OF APPROPRIATE CURRICULUM**

Curriculum is the content of what should be studied. So ICT has opened the door for sources of information and knowledge. These are large pools of knowledge or individuals to learn and curriculum developers are faced with the task of selecting from the large pools, in a particular discipline what learners have to experience (Ivowi 2002). Again recently, emphasis has shifted from learning in segment of discipline to inter-disciplinary approach. This is because in real life situation, a person does not interact in society based on academic discipline alone but a mixture of disciplines. For a person to be educated he/she need an appreciable knowledge of various concepts and principles that modify

his/her behavior towards a change for better. ICT could be utilized in science curriculum in the following ways:

- Merging a course with ICT as content (Computer Science)
- ICT as specific learning environment for science
- ICT communication of tools word-Processing
- ICT communication environment (E-mail, internet)
- ICT as a way to come from ordinary reading to multimedia reading

ICT encourages the focus on learning how to learn what to learn. This will help an individual when faced with a large source of information to be able to select few items which he/she could master in a formal setting while others could learn informally.

### **EFFECTIVE OF TEACHING AND LEARNING WITH THE USE OF ICT TOOLS FOR SUSTAINABLE NATION**

When ICT is employed in teaching students, they ask questions which can extend and enhance knowledge, understanding skill and scientific phenomena which may be too slow fast, too dangerous or too expensive to carry out in the school laboratory (Leicesfer 2003 in Ikeagu 2004). The students are so inquisitive and keened to know how to it was done with these ICT tools. In addition, when ICT is used as simulation and modeling, it can help the students to observe, predict and hypothesize so that they can investigate the effects of changing variables in the situations represented or consolidated understanding (Baggot La velle et al, 2003 & Owen 2003 in Ikeagu, 2004). Using ICT facility such as internet in teaching will serve as information resources which can enable the students to find information to develop their knowledge and understanding of science further (Denby, 2003). This is because the internet is a global computer network that allows data to be transferred from one computer to another. Besides, it offers a cheap means of communicating and accessing information which are broken into digital packets and distributed over large distance to enhance science education teaching and learning. This implies that new information as regards the understanding of science is readily available in the internet.

Furthermore, ICT employed in classroom teaching can enable the students develop understanding and present their findings to others (Leicester 2003 in Ikeagu, 2004). This is possible because ICT can capture, store processes, retrieve, transmit and present information from one area to another. Therefore, when they carry out experiment and exercise in the laboratory after observing that, that is presented by ICT, they can interpret their results to others as well as evaluate other scientific evidences. Finally, ICT can enable the students to organize, search and sort information after processing the stored information in order to explore relationships, look for patterns and test hypothesis. An example is the extracting of data of the nutrient value of the different foods (Leicester

2003 in Ikeagu, 2004). To the science teachers, ICT has great potentials of helping them achieve their goals in these ways.

- They can employ ICT in preparing teaching materials.
- To demonstrate experiments and concepts in science e. using presentation packages of food digestion or cell division using CAT.
- It can help teachers in supporting their students working with primary source of data during investigative and practical work i.e. information gotten from ICT can be presented to the students to enhance their knowledge, understanding and skills in science.
- It accesses information through the internet to enhance teaching and learning.
- It can communicate and exchange information with experts in specific fields, with other schools and with other teachers for the benefit and development of student (Ajagun 2003).

### **IMPLICATION OF USING ICT IN TEACHING AND LEARNING SCIENCE COURSES FOR SUSTIANABLE NATION**

ICT as we have been discussing has a clear knowledge of what the teacher and the learner should participate in. ICT employed the teaching of science also reduces abstraction in class lessons, conserve the teachers energy, reduce boredom among students and teachers because the learning environment is restructured thus, making lessons interesting and motivation to the students, promotes Students participation as well as encourages individual learning allows moral learning autonomy among students thereby making them take great responsibilities for their own learning because they learn at their own rate and style (Ikeagu 1994, in Adamu 2001).

### **CONCLUSION**

ICT has important role to play in enhancing science teaching and learning. The need to utilized ICT to enhance teaching and learning styles is recognized. ICT has been described as the scientific tools and techniques for developing, documenting, communicating information as and when needed especially as they concern solving problems or providing services in various areas of human endeavour.

In order to effectively use ICT in science teaching, there should be a change in what is taught, how it taught and relationship of our classrooms and schools to the society.

### **RECOMMENDATIONS**

The following recommendations were made:

- There must be supply of power to enhance the use of ICT

- There must be human machine and programs (Software) to work together to achieve a targeted goal.
- The facilitator of ICT in teaching and learning encounter must be grounded in areas of usage of computer and its operations.

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