

# Science teacher's usage of e-learning in southern Nigeria

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## Abstract

*This paper examines the role and use of Information and Communication Technology (ICT), notably E-learning for effective science education. E-learning is globally accepted as one veritable tool for attaining access, equity and quality in science education. The paper states the need for effective use of ICT by science teachers in maintaining and controlling according to policies laid down for sustainable science curriculum. The study adopted a descriptive survey technique. A total of 600 science teachers were selected from a total population of 1,600 in the Southern States of Nigeria. Some research questions guided the study. The science teacher has to plan in his capacity as an educator in ensuring effective instructional services. The paper highlights various ICT resources that can be used for effective and efficient integrated science curriculum. It also states some of the benefits and challenges of the use of ICT in Science education. It is the contention of this paper that though using ICT for integrated science curriculum development may seem difficult, it is imperative to take advantage and invest in these ICTs to deal with the huge pressure faced in the country's educational system. The remarks the need for infrastructure and how political will push ICT ahead.*

**Keywords:** E-learning, Teachers, Science education, e-learning usage, Nigeria

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## Introduction

The role of information and communication technology in sustainable development cannot be overemphasized. E-learning as an education electronic delivery methods, requires the following ICT Tools such as Compact Disc Roms (CD Roms) Video conferencing, Websites, E- mail. it covers a wide set of applications and processes such as web-based learning, computer- based learning, virtual classrooms, digital classrooms, delivery content via internets, intranet, extranets (LAN/WAN), Audio and Videotapes, satellite, interactive TV and CD-Rom (Allen and Seaman 2008) Olorundare (2006) Observes that e- learning has an advantage of providing accelerated and required courses which eventually lead to increased graduation rates and highly reduced drop-out rate of students.

Abirina (2010) defines e-learning as the use of new multimedia technologies and the internet to enhance the quality of learning

by facilitating access to resources and services as well as remote exchange and collaboration. E-learning is therefore a process of teaching and learning comprising instructions delivered through all electronic media such as the internet, intranets, extranets, satellites broadcasts, audio video tapes, interactive TV and CJ) Rooms. Body (2005) discovers that e-learning facilitates access to knowledge that is relevant and useful. It is a learning facilitated and supported through the use of ICT and learning activities based on electronic formats (Mansell and Silver Stone, 1996, Mankilik and Agbo, 2006).

E-learning has the potential of benefiting any student irrespective of the background as a result of enhancing learning opportunities provided by ICT (Arunachalam, 2005, Iwu and Ike, 2009). It allows learners to learn anything and from every location across the world. This is only possible with ICT tools. These include:

**Computer:** This is an electronic machine that is capable of

receiving, storing, manipulating and retrieving data speedily and efficiently. This device is accepted as the best educational technology medium for individualizing instruction, its effective application comes in form of computer-based education.

**Teleconferencing:** This is the process of using telephone to enable one-to-one contact between the students and instructors, it is more beneficial when the communicators and communicants are widely dispersed and separated by difficult terrains. It also supplements face-to-face technique. Where efficient communication already exist. It is very efficient in task achievement but more task-centred and impersonal than face-to-face technique. Science teachers are supposed to be very efficient and effective in utilizing this e-learning method to a wide range of student etc. This will go a long way to reduce dangers of always being on the road for lectures on both lecturers and students. Cost of transportation is also reduced (Abirini, 2010). Asogwa, (2006) reports that incorporating an audio bridge, learners in remote places can call for synchronous conversation. High population of students could be attended to with less stress and pressure on both the teachers and the students.

**Interactive Video:** This is very effective tool for conveying information. It involves the use of a video delivery system, usually video discussion or sometimes video tapes, designed in a way a to respond to choices made by the individual users. The video must present the user with choices of what to see next, for this approach to become truly interactive. This simply implies that it must influence the user's action. A good example is the use of video cassette recorder (VCR) which enables one to watch movie, rewind to watch a segment over again, fast- forward to skip over parts, pause the movie or even watch it in slow motion (Ambient, 2009).

These include:

- (i) Local Area Network (LAN) which exists and operates within a particular classroom or building.
- (ii) Wide Area Network (WAN) which makes use of networking electronic devices that cover the entire or sections. of an institution, educational zone 'etc. It can be used to connect two campuses of same institution in different geographical zones/locations.
- (iii) World Wide Web (www) Internet: These provide hypermedia access to instruction through point and

click. It is network of other network comprising several millions of computers all over the world sharing from the same data pool. It provides internet users with uniform and convenient means of accessing the wide variety of resources (e.g photos, graphics, texts, audio-video etc.) in an interactive environment. Science teachers making use of these have the advantage of enjoying within the internet service, an unusually large amount and types of resources available to them. The instructional possibilities are as follows:-

E-mail used for correspondence and dissemination of information. New groups accommodating discussion group in the internet.

Chat room/messaging allow communication between groups or individuals on computers and other internet service providers.

Developing classroom home page that could cover information about the class, (syllabus, exercise, literature, conferences, biographies etc).

Streaming audio/video, web site boarding, file transfer, telenet etc. Science teachers effective use of these e-learning methods of internet tools will definitely help to bring the needed materials when the user makes use of search engines, meta- search engines, subject directory, the visible web page, electronic referral, virtual library, fascimile etcetra (Allen and Seaman, 2008).

Quality of science education in general terms refers to fitness of teaching science to purpose in relation to the users and customers needs. It also refers to the products conformity to standards and specifications. The issue of quality in science education in Nigeria(Opara,2005) has continue to be a great challenge to policy makers. It is more obvious at this era of surging increase in human population and ever growing need for further education are beyond the capacity of formal system of education, This has given rise to students most parents emphasis on certification, unnecessary efforts towards quantity in place of quality science education(Opara,2003). E-learning remains a viable option, for achieving quantity without sacrificing quality, It avails the students opportunities of actively p' in classroom transactions as well as producing and sharing knowledge.

Body's (2005) is of the opinion that e- learning through Global virtual university internet will level barriers in social relations around education. E-learning facilitation will enable students through the use of e- tools to:- Become more individually and actively involved in the learning process. Become more independent in their learning and hence make more choices about how and what they learn. More at appropriate pace in their learning. Become adequately challenged in their learning activities.

Become more creative in the way that they respond to the learning process.

### Research Questions

1. How could electronically delivered learning enhance quality in Nigeria science education?
2. What are the e-learning technologies/ tools science teachers of Nigeria require for effective implementation of e- learning?
3. Do these science teachers possess the needed skills to utilize the e- learning technologies identified?
4. What are the impediments to science teacher possession of the needed e-learning technology skills for quality e-learning implementation?
5. How could these impediments be redressed?

### Methodology

A descriptive survey design was meant to assess opinion responses on the present situations. A total of 600 science teachers were purposefully selected from a total staff population of 1,600 in the Southern States of Nigeria. Five research questions guided the study. A researcher designed questionnaire was used for data collection.

### Results

Result in Table 1 with grand mean of 3.21 which is above the weighted mean of 2.50 indicates that science teachers generally agreed with the five items as ways e-learning could promote quality education.

**Table: Mean responses of science teachers on the extent e-learning could be used to enhance quality in education in Nigeria.**

S/N	Ways e-learning could be used to enhance quality science education in Nigeria are by	Science Teachers X	Remarks
1	Facilitating both students and staff access to resources	3.75	High extent
2	Providing new trend in enhancing quality education	2.54	High extent
3	Utilizing quality technology in taking classroom to geographically distinct and separate environments	3.10	High extent
4	Serving as specific media to implement the e-learning process	3.30	High extent
5	Transcending he boundaries of traditional class room instructions	3.44	High extent
	<b>Grand Mean</b>	3.21	High extent

**Table 2. Mean responses of science teachers on e-learning technologies require to implement e-learning**

S/N	Item	Science Teachers X	Remarks
6	Computers	4.00	Agree
7	Teleconferencing	2.68	Agree
8	Radio broadcast	3.50	Agree
9	Interactive video	2.57	Agree
10	Network system	3.92	
	<b>Grand Mean</b>	<b>3.33</b>	

Result in Table 2 reveals a grand mean of 3.33 indicating science teachers general agreement with the five items as e-learning technologies required to facilitate e-learning in Nigeria. Items 7 and 9 have lower means scores compared to others. This implies that majority of these science teachers are not very knowledgeable with skills of applicability of teleconferencing and interactive video as quality control e-learning tools.

**Table 3. Mean Responses of science teachers on extent of science teacher’s possession of the needed skills to utilize the e-learning technologies.**

S/n	Item	Science Teachers X	Remarks
11	Majority of science teachers are computer literate	2.42	Low extent
12	Majority of science teachers are ICT literate	1.95	Low extent
13	Majority of science teachers are ICT literate	2.30	Low extent
14	Majority of science teachers can deliver lecture using power point	0.00	Low extent
15	Majority of science teachers have skill of teleconferencing.	2.96	Low extent
	Majority of science teachers can utilize flash and CD to store their work	<b>1.93</b>	
	<b>Grand Mean</b>		

Result in Table 3 reveals a grand mean of 1.93 that is very much below 2.50. This simply indicated science teacher’s general disagreement with the items that skills are possessed to high extent by science teachers. Only item 15 is the skill possessed to high extent others are possessed to a low extent.

**Table 4. Mean Responses of science teachers on the impediments to acquisition of the e-learning tools skills.**

S/N	Item	Science Teachers X	Remarks
16	Poor supply of electricity.	3.93	Agree
17	Poor teledensity.	2.80	Agree
18	inadequate skill in designing courseware and software	3.95	Agree
19	Poor funding of ICT education and e-learning training methodology	4.00	Agree
20	High level poverty	3.10	Agree
21	Poor level ICT literacy.	3.84	
	<b>Grand Mean</b>	<b>3.45</b>	

Result in table 4 above reveals a grand mean of 3.45 which is very much higher than 2.50 indicating the general agreement with the items by lecturers as impediments to effective

utilization of e-learning and its tools for quality teaching and learning.

**Table 5. Mean responses of academic staff on the ways science teachers e-learning technology skills utilization could be enhanced.**

S/N	Item	Science Teachers X	Remarks
22	Adequate supply of electricity.	3.67	Agree
23	Ensuring high teledensity	2.81	Agree
24	Providing lecturers with enabling environment to acquire the necessary e-learning tools.	3.93	Agree
25	Adequate funding of ICT	3.88	Agree
26	Enhancing a staff to enable them procure a laptop	4.00	Agree
	<b>Grand Mean</b>	<b>3.45</b>	

Result in Table 5 above reveals science teacher’s grand mean of 3.66 indicating their general agreement with the five items as strategies for enhancing technology skills for quality instruction and production of quality graduates.

### Discussion

The issues and challenges of poor and falling standard of education, particularly science education have been a serious concern to educational managers and policy makers. The findings of the study identified five ways learning could be used to a high extent to enhance quality science education in Nigeria. Such ways include facilitation of both students and lecturers access to resources, ensuring new trend quality higher education, ensuring effective utilization of e-learning technologies. This finding is in line with the observations of Abirini (2010) that see e-learning as a measure of utilizing multimedia technologies, computer and Internet to promote quality of learning by facilitating access to resources and services. E-learning as a new teaching and learning method, promotes quality of students learning, performance and products.

This study resonates with the observation of Asogwa (2008) that majority of Nigerian teaching staff lack basic ICT tools utilization skills. Some of the impediments identified include inadequate supply of electricity, low teledensity. They are impediments to effective e-learning and implementation

in science education. All in all, the identified constraints include irregular and inadequate electricity supply, low tele-density, low skills in designing course-ware, poor funding, inadequate ICT tools utilization skills by the science teachers etc. These observations also are in conformity with that of the study.

### Recommendations

Government should encourage e-learning by ensuring adequate provision of ICT tools and technologies necessary for promoting e-learning (Opara,2004, Opara,2005).

Science teachers in Nigeria should be assisted to have access to these technologies and opportunities to acquire the needed skills through sponsorship of their attendance to workshops and conferences.

Blended learning services should be integrated with practical classroom based situation by making classroom lectures power-point slides available to students through websites or learning management system.

Students are encouraged to own a laptop, bring them to classroom for face to face class for hybrid learning. They should be made to appreciate the rationale for encouraging and advocating e-learning for quality enhancement of higher education in Nigeria.

Government, university management and philanthropists should contribute towards adequate provision of e-learning technologies and ICT tools in schools.

Science teachers should be encouraged to acquire the needed skills for the effective implementation of e-learning facilities in our higher institutions. They should be massively upgraded as a means of assuring quality.

The question of inadequate power supply of Nigeria should be redressed.

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