

Extent of Application of E-Learning in Teaching Agricultural Science in Senior Secondary Schools in Nsukka Metropolis

by

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Abstract

The study sought to assess the extent to which e-learning is applied in teaching and learning agricultural science in senior secondary schools in Nsukka Metropolis. Four specific purposes and four research questions were posed to guide the study. The study adopted survey research design and was carried out in Nsukka, Enugu State. The population for the study was 168 comprised of 36 principals and 132 agricultural science teachers in public owned secondary schools in the study area. There was no sampling due to the manageable size of the population. The instrument for data collection was a structured questionnaire which was validated by three experts. Cronbach alpha reliability of 0.78 was obtained for the entire Instrument. Data was collected by the researcher with the help of six research assistants. Data were analyzed using mean and standard deviation for answering the research questions. Based on the data analyzed, the study found that: e-learning was utilized to a moderate extent in three ways, lowly utilized in five ways and very lowly utilized in two ways; e-learning was utilized to moderate extent in one way, lowly utilized in five ways and very lowly utilized in four ways; e-learning was utilized to moderate extent in four ways and very lowly utilized in three ways; and e-learning in teaching agricultural science in secondary schools in Nsukka metropolis. The study therefore recommended that; Curriculum planners should inculcate e-learning into all agricultural education teacher programmes to ensure that teachers are well-equipped on the ways to inculcate e-learning resources in lesson preparation; and the school administration should organize seminars/workshops for training/retraining of already employed agricultural science teachers on the ways of using e-learning for lesson delivery.

Keywords: Agricultural Science, E-learning, Application, Teaching, Secondary School.

Introduction

Agriculture is one of the subjects taught at senior secondary schools in Nigeria. Senior secondary school refers to the last three years of secondary education after the completion of junior secondary schools. At the senior secondary level, agriculture is called agricultural science. According to Egbule (2009), agricultural science is a process of training learner in the process of agricultural productivity. It is taught in the school to teach the students the principles of using scarce resources to produce crops and animals to feed the world's population (Ikehi, Ifeanyieze & Ugwuoke, 2014). National Examinations Council (2014) stated that the objectives of teaching agricultural science in senior secondary schools include; stimulation and sustenance of student's interest in agriculture, impart functional knowledge and practical skills in agriculture to students, prepare students for further studies and for occupation in agriculture. In line with this, Shimave, kesiki and Yani (2013) pointed out that the

introduction of agricultural science in the secondary school system is a strategy for increasing agricultural productivity on a long-term basis. With these objectives in mind, the education industry is expected to provide effective and adequate practical training in Agriculture to students in order to enable schools and colleges provide qualified and competent graduates that can engage in agricultural production in Nigeria. The review of Agricultural Science curriculum has been a real educational innovation, which called for new teaching strategies considering the fact that senior secondary education is indeed an essential condition to attainment of the new education reform for it serves as a link between basic education and tertiary education by absorbing the products of the former and supplying entrants into the latter (Egunsola, Denga & Pev 2014). The researchers observed that agricultural science at the secondary school level has failed to produce graduates that have favorable attitudes to farming. Furthermore, there is the problem in learning of agriculture by students in

senior secondary schools in Nigeria because the general believe is that there is low interest of students in learning agricultural science (Nwachukwu, Onah, Obijiofor, Nwankwo & Nwakile, 2020). The issues associated with learning agriculture can be improved through the utilization of technology. Technology in learning is usually combined through E-learning (Egunsola, Denga & Pev, 2014).

E-learning is a learning system based on formalized teaching but with the help of electronic resources. E-Learning is one of the parts of leT that has been engulfed in education and adopted in order to transform traditional learning environments and create efficiently attractive learning modern environment (Eneh, 2015). Ezama (2017) opined that E- Learning is the direct results of the amalgamation of technology and education, which enables the creation of innovative research, delivery mechanisms and self-discovery which is one of the features of modern learning. E-learning in education is the wholesome integration of modern telecommunications equipment and ICT resources, particularly the internet, into the education system. Ajayi (2012) referred to E-Learning as an "instruction delivered via all electronic media including the internet, intranets, extranets, satellite broadcasts, audio/video tape, interactive TV, and CD-ROM". According to Adesoji (2012), E-Learning is an innovative approach to education delivery via electronic forms of information that enhance the learner's knowledge, skills, or other performance". Therefore, E-Learning in the context of the study refers to delivering the learning and teaching process in agricultural science through the utilization of electronic resources like computers and projectors, amongst others to enhance the quality of learning and to improve the performance of learners. E-learning can be utilized across all fields in education including teaching and learning of agricultural science in senior secondary schools.

In teaching agricultural science, e-learning could be in many forms. Teachers can use Powerpoint to project their points to students in the classroom to enhance their interest and participation. Furthermore, students can create a WhatsApp group where they discuss assignments given in the classroom. Utilizing E-Learning in teaching agricultural science in senior secondary schools improves the quality of learning experience and support learning by offering differentiated learning. Additionally, according to

Amedu (2014), e-learning transcends temporal and geographical barriers by offering learning in secondary schools anytime anywhere. It suffices to say that developments in E-Learning have broken all national and international barriers in communication thereby turning the world into a global village; by making information available to secondary school student anywhere, anytime. Eze and Uzoka (2012) stated that e-learning can be utilized in lesson preparation, lesson delivery and lesson assessment.

Preparation is quite vital for the successful accomplishment of any task. In teaching, more time is often spent in preparing any good lesson than presentation. Lesson preparation involves the selection of appropriate and effective learning activities. During lesson preparation, the teacher takes a close look at the context, the objectives, the learning experiences his hope to offer the learners and those -resources his hopes to use for teaching (Akinseinde, 2018). According to Angib (2019), in preparing any lesson to be taught to the students, the teacher consults the course of study for the lists of topics to be covered, the course content, objectives of the lesson, students' activities, equipment and material. The author further explained that lesson preparation ensures that the teacher takes time to think about the topic of the lesson, how the lesson would be presented it to the students and the resources (materials) needed, etc. Today, major advancement in lesson preparation has emerged due to e-learning. There are various ways e-learning can be used in lesson preparation. For instance, Afolabi (2017) posited that internet is a gateway to libraries that the teacher can use to search for materials for the lesson. Gupta (2008) in supporting this posited that information virtually in any lesson can be obtained easily on the internet. He further noted that a teacher can have a good browse at textbooks, newspapers, magazines, academic papers, government document famous, speeches, novels, etc. through the internet. E -learning can also be used in lesson delivery.

Instruction delivery is the core of every lesson. It deals with the interaction of the teacher with the students in the classroom. Any prepared lesson has to be put into operation. No plan will teach itself no matter how wonderful it looks on paper. Instruction delivery is what makes the lesson exciting and interesting. Instruction delivery contains two interwoven elements. These include an outline that arranges the exact content in order to that will be

taught and ways to teach various parts of the lesson. The emergence of e-learning has revolutionized the practice of instruction delivery. Anne and Stewart (2013) posited that the growing of ICT as an instructional media is changing many of the strategies employed by lecturers in instruction delivery. Mohammed (2017) pointed out that terminologies in institutions have changed because the role of a teacher has become that of a tutor, mentor, accompanier or mediator and no longer the only holder of knowledge. In the forefront of promoting ICT integration for global resource sharing is the internet which is now a new paradigm of instruction delivery. This however, has given teaching a global approach. Esther (2018) postulated that many teachers use the electronic interactive board during lesson delivery to make the lesson interesting and ensure students are active. Through WhatsApp groups, teachers can disseminate learning materials to their students at any time of the day or night without geographical bound on the net (Ezama, 2017). After lesson delivery, e-learning can also be utilized in lesson assessment.

Lesson assessment can also be called lesson evaluation and it is done to ascertain if the instructional objectives of the lesson have been achieved. Assessment is basically supposed to produce desirable changes in the recipient. Hence, the ultimate purpose of an educational process is not only the award of a certificate but also the acquisition of knowledge or skills which can be used in a real-life situation for the benefits of the individual, and that of the society (Torruam, 2012). The real test of the quality of any educational programme is how the people trained perform and can perform in their place of employment. Thus, the sponsors of educational programmes need to find out if the intended changes or behavioral outcomes have equally taken place which is the purpose for assessment or evaluation of teaching. Assessment is important to determine the effectiveness of the process of teaching/learning and development in order to plan wisely for the next step(s) of interaction. These appraisals should be made periodically during the teaching-learning period as well as at its completion. Through e-learning, evaluation can be done using basic telephone and radio broad cast principles and allows evaluation of the training program to be transmitted simply and simultaneously from one computer anywhere in the world to another (Oyinloye, 2018). According to Tinio (2012), students sit for exams anywhere in the

world using laptops, phones and iPads connected to the internet. Furthermore, Amedu (2014) opined that computer and iPads can be used in marking exam scripts which is aimed at lesson assessment. Since e-learning improves the quality of education of a nation, it will be worthwhile to pay more attention to utilization of E-Learning facilities.

E-learning facilities includes computer system, internet and computer network applied in lesson preparation, assessment, and administration of senior secondary schools. Use of internet and computer networking and use of slide shows in lesson delivery (teaching). These facilities were selected amongst other facilities because they are the most frequently used e-learning facilities for teaching (UNESCO, 2011). However, despite the fact that e-learning and the utilization of e-learning resources can improve lesson preparation, delivery and assessment, there is a question mark surrounding the extent of utilization of e-learning resources in Nsukka metropolis.

Nsukka is a town located in a South-Eastern state called Enugu. In the area, traditional teaching materials like chart, recommended texts, and live material improvised by the agricultural science teachers to teach is still prevalent in the area. A pre-study visit by the researcher to the area shows that many agricultural science students in senior secondary schools in the area find the subject boring while some perform poorly in it due to low interest. Literature has revealed that e-learning can improve interest of students in a subject leading to increased higher performance and attainment of instructional objectives (Torruam, 2012; Ezama, 2017; Esther, 2018). However, the low interest of students in agricultural science in the area coupled with poor performance makes one wonder the extent to which e-learning is applied in teaching agricultural science in senior secondary schools in the area. However, there is a dearth of literature addressing issue of extent of using e-learning for teaching agricultural science in senior secondary schools in the area. If the problem is left unresolved, the objectives of agricultural education at the senior secondary school level would continuously not be attained. It is against this backdrop that the study aims to ascertain the extent of using e-Learning for teaching agricultural science in senior secondary schools in the area.

Statement of the Problem

E-Learning has been integrated into many educational systems to reap the benefits of the rapid

developments in technology, which assist in improving the learning experience and increasing its efficacy. Over the years, traditional teaching materials like chart, recommended texts, meter rule, set-square and live material were improvised by the teacher to effectively teach agricultural science in senior secondary schools in Nsukka metropolis. However, through e-learning, new and improved teaching aids are being adopted. Significant progress has been made in e-learning in the last couple of decades and the rate of adoption in educational system have remained unforecasted, in spite of the accompanying gains and the clarion call for e-learning application even at the senior secondary school level (Ochei, 2014). However, efforts have been made to enhance the utilization of e-learning in teaching and learning many educational settings in Nigeria

In consonance, the Nigerian Educational system initiated and activated the application of e-learning for teaching and learning in all educational settings including senior secondary schools. Thus, a comprehensive E-Learning competencies standard for teachers in Nigeria was developed and produced by UNESCO in 2008, reviewed in 2011. Till date, the teachers are expected to embrace the application of e-learning in teaching and learning of all subjects including agricultural science in classroom in senior secondary schools, in Nsukka Metropolis but the extent of application is not known. However, the benefits of e-learning such as increased interest and attainment of objectives of agricultural does not seem to be the case in Nsukka metropolis. Therefore, it became appropriate to assess the extent to which e-learning is applied in teaching and learning agricultural science in senior secondary schools in Nsukka Metropolis.

Purpose of the Study

The general purpose of this study was to assess the extent of application of e-learning in teaching agricultural science in senior secondary schools in Nsukka Metropolis. Specifically, the study seeks to ascertain the:

1. Extent to which agricultural science teachers apply e-learning in lesson preparation in senior secondary schools in Nsukka Metropolis.
2. Extent to which agricultural science teachers apply e-learning in lesson delivery in senior secondary schools in Nsukka Metropolis.

3. Extent to which agricultural science teachers apply e-learning in lesson assessment in senior secondary schools in Nsukka Metropolis.
4. Constraints to the application of e-learning in teaching agricultural science in secondary schools in Nsukka Metropolis.

Research Question

The following research questions guided the study:

1. To what extent do agricultural science teachers apply e-learning in lesson preparation in senior secondary schools in Nsukka Metropolis?
2. To what extent do agricultural science teachers apply e-learning in lesson delivery in senior secondary schools in Nsukka Metropolis?
3. To what extent do agricultural science teachers apply e-learning in lesson assessment in senior secondary schools in Nsukka Metropolis?
4. What are the constraints to the application of e-learning in teaching agricultural science in secondary schools in Nsukka Metropolis?

Methodology

The design of the study was a survey design. Nworgu (2015) described survey research design as "those studies which aim at collecting data and describing in a systematic manner the characteristics, features or facts about a given population". The design was adopted because the study involved the use of structured questionnaire to elicit responses from the respondents on extent of application of e-learning in teaching agricultural science in senior secondary schools in Nsukka Metropolis.

The study was carried out in Nsukka metropolis. Nsukka is a town in Enugu state and its indigenes are predominantly Igbo. The research was carried out in all the public owned secondary schools in Nsukka Metropolis. The area was chosen because e-learning tends to increase effective teaching and learning in all subjects but the extent to which it has been adopted for teaching agricultural science in the area remains unknown. This could be the reason for the poor performance of students in public exams in agricultural science in the area. Hence, it was necessary to assess extent of application of e-learning in teaching agricultural science in secondary schools in Nsukka metropolis.

The population for the study was 168 comprised of 36 principals and 132 agricultural science teachers in public owned secondary schools in the study area

(Personnel Research (PRS) Unit, Post Primary Schools Management Board (PPSMB) Nsukka Zone, 2022).

There was no sample or sampling technique involved due to the manageable size of the population. Hence, the entire population would be involved in the study.

A structured questionnaire titled Extent of Utilization of E-Learning Questionnaire (EUEQ) was developed by the researcher from literature consisting of 36 items divided into two sections was used as the instrument for data collection. Questionnaire items were generated through the literature reviewed and were drawn to reflect the research questions. The two sections and the number of items in each section are as follows; Section A - Demographic data while section B has four clusters namely cluster 1, 2, 3 and 4. Cluster 1 sought information on the extent to which e-learning is used by agricultural science teachers in lesson preparation (10 items); Cluster 2 elicited information on the extent to which e-learning is used by agricultural science teachers in lesson delivery (10 items), Cluster 3 sought information on the extent to which e-learning is used by agricultural science teachers in lesson assessment (7 items); Cluster 4 elicited information on the constraints to the application of e-learning in teaching agricultural science in secondary schools in Nsukka Metropolis (9 items).

The questionnaire was coded with nominal values designed for each possible response that is expected from the respondents. Each of the items will be scored on the basis of the code. The items in section B are on a five-point response option of Very High Extent (VHE), High Extent (HE), Moderate Extent (ME), Low Extent (LE) and Very Low Extent (VLE). Respondents are required to indicate their opinions by check in the appropriate column of the response options.

The instrument was subjected to face validation by three experts in Department of Agricultural Education, University of Nigeria, Nsukka. The drafted copy of the questionnaire, the purpose of the study and research questions were given to them. They read through the items of the questionnaire, make their comments and contributions which were included in the final copy of the questionnaire.

The internal consistency of the instrument was determined using Cronbach Alpha. The questionnaire was administered to 20 staff (16 agricultural science teachers and 4 principals) of secondary schools in Enugu Metropolis. The choice of Enugu metropolis was due to the town having similar characteristics to the study area but was outside the area of the study. The data collected was used to compute reliability coefficient of the instrument which yielded a coefficient of 0.78. The instrument would be assumed to be reliable if it has a reliability coefficient of 0.70 or above (Nworgu, 2015)

One hundred and sixty-eight copies of the questionnaire were administered through personal contact to the respondents with the help of six research assistants. The researcher briefed the research assistants on the best way to approach the respondents and on the need to explain anything necessary as requested by the respondents. Out of the 168 copies of questionnaire administered, 159 were correctly filled and retrieved.

The data collected were analyzed using mean statistic. Nominal values were assigned to each scaling item of the questionnaire. In other words, 4, 3, 2 and 1 were applied to represent VHE, HE, ME, LE and VLE. Real limit of numbers was applied in decision making. Any item that had mean values ranged from 4.50 - 5.00 was regarded as VHE. Any item that had mean values ranged from 3.50 - 4.49 was be regarded as HE. Any item that had mean values ranged from 2.50 - 3.49 was be regarded as ME. Any item that had mean values ranged from 1.50 - 2.49 was regarded as LE. Any item that had mean values ranged from 1.00 - 1.49 was regarded as VLE.

The standard deviations (SD) of the items were also analyzed. Any item with SO value of 1.96 or below indicated that the respondents were near to the mean and to each other in their responses. On the other hand, any item with SD value above 1.96 indicates that the respondents were far from the mean and to each other in their responses.

Results

Data for answering research questions and are presented in Tables 1

Table 1: Mean ratings and standard deviations of respondents on the extent agricultural science teachers apply e-learning in lesson preparation

N= 159

S/N	ITEMS	\bar{X}	SD	REMARKS
1	Use of Internet as a library to source information for writing lesson notes in agricultural science	2.76	0.92	ME
2	Use of Microsoft word package in preparing lesson note in agricultural science	1.59 0.94	LE	
3	Use of phones to call colleagues on conceptual clarifications related to the lesson being prepared	2.05	0.97	LE
4	Use of YouTube videos to gather information especially for practical agricultural lessons 1.48	0.96	VLE	
5	Surfing materials through World Wide Web to get information on various topics in agriculture	2.88	0.90	ME
6	Use of Research gate to ask for conceptual clarifications on lessons to be prepared	1.52	0.80	LE
7	Listening to voice recordings of experts on related issues on the agricultural topics being prepared	1.32	0.96	VLE
8	Use of phones to source for instructional materials on the web	3.02	0.87	ME
9	Use of iPads in sourcing for information from the web	1.78	0.74	LE
10	Utilization of PowerPoint package to design slides for the lesson	2.42	0.87	LE

\bar{X} = Mean, SD = Standard Deviation, N= Population, VHE= Very High Extent, HE = High extent, ME = Moderate Extent, LE = Low Extent, VLE= Very Low Extent.

Data in Table 1 revealed that 3 out of the 10 items (1, 5 & 8) had mean values ranged from 2.76 - 3.02 showing that the e-learning activities represented by the items are applied to a moderate extent in lesson preparation by agricultural science teachers. The Table also revealed that 5 out of the 10 items (2, 3, 6, 9 & 10) had mean values ranged from 1.52 - 2.42 indicating that the e-learning activities represented in these items are practiced to a low extent in lesson preparation by agricultural science teachers. The

remaining two items (4 & 7) had mean values of 1.48 and 1.32, showing that the e-learning activities represented in these items are practiced to a very low extent in lesson preparation by agricultural science teachers.

The standard deviation of all the 10 items ranged from 0.74 - 0.97. Each of the values were below 1.96 indicating that the respondents were near to the mean and to each other in their responses.

Table 2: Mean ratings and standard deviations of respondents on the extent agricultural science teachers apply e-learning in lesson delivery

N=159

S/N	ITEMS	\bar{X}	SD	REMARKS
1	Use of phones to access emails needed to send copies of delivered lessons to agricultural science students	2.42	0.87	LE
2	Use of laptops to present lessons to agricultural science students through video call.	1.32	0.80	VLE
3	Utilization of electronic interactive board during agricultural science instructional delivery	2.53	0.76	ME
4	Use of social media channels like WhatsApp to share lesson materials to agricultural science students.	1.48	0.91	VLE
5	Utilizing Video CDs which could be played through laptops for lesson delivery	2.28 0.97	LE	

6	Use of power point presentations to make agricultural science lessons interesting	1.82 0.61	LE	
7	Use of web conference streaming during lesson delivery	1.32	0.94	VLE
8	Establish a classroom bulletin board on the net for instruction delivery	1.20	0.80	VLE
9	Engaging in dialogue with the students using social media	1.78	0.77	LE
10	Utilization of YouTube videos in delivering lessons especially practical agriculture.	1.52	0.75	LE

Data in Table 2 revealed that out of the 10 items (3) had a mean value of 2.53 showing that the e-learning activities represented by the items are applied to a moderate extent in lesson delivery by agricultural science teachers. The Table also revealed that 5 out of the 10 items (1, 5, 6, 9 & 10) had mean values ranged from 1.52 - 2.42 showing that the e-learning activities represented by the items are applied to a low extent in lesson delivery by agricultural science teachers. The remaining four

items (2, 4, 7 & 8) had mean values ranged 1.20 - 1.48, showing that the e-learning activities represented by the items are applied to a very low extent in lesson delivery by agricultural science teachers.

The standard deviation of all the 10 items ranged from 0.61 - 0.97. Each of the values were below 1.96 indicating that the respondents were near to the mean and to each other in their responses.

Table 3: Mean ratings and standard deviations of respondents on the extent agricultural science teachers apply e-learning in lesson assessment in senior secondary schools

N= 159

S/N	ITEMS	X	SD	REMARKS
1	Conducting exams using laptops connected to the internet without any geographical barrier.	1.34	0.78	VLE
2	Utilization of computer and robots to mark agricultural science examination scripts	1.18	0.95	VLE
3	Use of E-mail application to send assignments to agricultural science students	2.60 0.61	ME	
4	Use of social media like WhatsApp to receive questions from agricultural science students have on confusing topics	2.82	0.74	ME
5	Use of E-mail application to receive answers of agricultural science students to assignments	3.25	0.57	ME
6	Use of phones to receive assessment of agricultural science students	1.40	0.92 VLE	
7	Use of laptops to grade agricultural science students' performance in assignments/tests	3.32	0.79	ME

Data in Table 3 revealed that 4 out of the 7 items (3, 4, 5 & 7) had mean value ranged from 2.60 - 3.32, showing that the e-learning activities represented by the items were applied in to a moderate extent in lesson assessment by agricultural science teachers. The Table also revealed that 3 out of the 7 items (1, 2 & 6) had mean values ranged from 1.18 - 1.40 showing that the e-learning activities

represented in these items were practiced to a very low extent in lesson assessment by agricultural science teachers.

The standard deviation of all the 7 items ranged from 0.57 - 0.95. Each of the values were below 1.96 indicating that the respondents were near to the mean and to each other in their responses.

Table 4: Mean ratings and standard deviations of respondents on the constraints to the application of e-learning in teaching agricultural science in secondary schools

N= 159

S/N	ITEMS	X	SD	REMARKS
1	Inadequate qualified agricultural science teachers capable of utilizing ICT in schools	4.72	0.95	VHE
2	Inadequate computers	4.42	0.94	HE
3	Unstable electricity	4.45	0.97	HE
4	Poor maintenance culture	3.83	0.98	HE
5	Poor internet connection	3.96	0.99	HE
6	High cost of internet services	4.03	0.54	HE
7	Inadequate training/retraining packages for teachers.	4.56	0.76	VHE
8	Inadequate funds for the development of e-learning infrastructures	3.79	0.81	HE
9	Inadequate manpower to maintain Information Communication Technology (ICT) infrastructure	4.20	0.70	HE

Data in Table 4 revealed that 2 out of the 9 items (1 & 7) had mean values of 4.72 and 4.56 respectively, showing that the constraints represented in these items hinder application of e-learning to a very high extent. Data also revealed that the remaining 7 out of the 9 items (2, 3, 4, 5, 6, 8 & 9) had mean values ranged from 3.79 - 4.45, showing that the constraints represented in these items hinder application of e-learning to a high extent

The standard deviation of all the 9 items ranged from 0.54 - 0.99. Each of the values were below 1.96 indicating that the respondents were near to the mean and to each other in their responses.

Discussion of Findings

The findings that emanated from the study were discussed based on the research questions answered as follows:

The extent e-learning is applied by agricultural science teachers in lesson preparation

The findings of the study show that that the extent of application of e-learning in lesson preparation is generally low and is only utilized in the following ways; Use of Internet as a library to source information for writing lesson notes in agricultural science; surfing materials through World Wide Web to get information on various topics in agriculture; and use of phones to source for instructional materials on the web. The findings are in line with Gupta (2008) who found out that lesson preparation is made easier in schools because information virtually in any lesson can be obtained easily on the internet and that a teacher can have a good browse at textbooks,

newspapers, magazines, academic papers, government document famous, speeches, novels, etc. through the internet. The findings are also supported by Madu and Adeniran (2009) who found out that the internet plays a big role in locating information, exchanging information and disseminating information between teachers and students.

The extent e-learning is applied in lesson delivery by agricultural science teachers

The findings of the study show that the extent e-learning is applied in lesson delivery in Nsukka metropolis is very low and is only applied in the utilization of electronic interactive board during agricultural science instructional delivery. The findings are in line with Esther (2008) who found out that many teachers use the electronic interactive board during lesson delivery to make the lesson interesting and ensure students are active. The findings are also in line Ajayi and Ekundayo (2009) who found out that videos are not shown to the students and that topics were mostly explained theoretically without much illustrations. The findings are also in agreement with Aboderin and Kumuyi (2013) who found out that in secondary schools, there is low extent of utilization of e-learning facilities like projector in lesson delivery

The extent e-learning is applied by agricultural science students in lesson assessment

The findings of the study show that application of e-learning in lesson assessment is low and is only applied following ways; Use of E-mail application to send assignment to agricultural science students, use of social media like WhatsApp to

receive questions from agricultural science students have on confusing topic, use of E-mail application to receive answers of agricultural science students to assignments and use of laptops to grade agricultural science students' performance in assignments/tests. The findings are in line with Tinio (2002) who found out that e-learning can be applied in lesson assessment as students sit for exams anywhere in the world using laptops, phones and iPads connected to the internet. The findings also supported by Amedu (2014) who found out that both students and educators in different institutions or part of the globe can use internet to access e-mail services which could be used to route assignment to students, submit completed assignment to teachers and make enquiries and receive responses for teaching and learning.

Constraints to the application of e-learning in teaching agricultural science

The findings of the study show that the constraints to the application of e-learning in teaching agricultural science secondary schools in Nsukka metropolis are as follows; Inadequate qualified agricultural science teachers capable of utilizing ICT in schools, inadequate computers, unstable electricity, poor maintenance culture, poor internet connection, high cost of internet services, inadequate training/retraining packages for teachers, inadequate funds for the development of e-learning infrastructures and inadequate manpower to maintain Information Communication Technology (ICT) infrastructure. The findings are in line with Torruarn (2012) who found out that the constraints to the utilization of e-learning in secondary schools include; Lack of qualified teachers to teach ICT in schools, lack of computers, lack of electricity and poor maintenance culture. The findings are also in line with Atsumbe, Raymond, Enoch and Patrick (2012) who found out that the constraints to the application of e-learning in secondary schools include; high cost of internet services needed by students and lecturers, high cost of air time' affects the use of internet services and high cost of maintaining electronic gadgets discourages their use for e-learning.

Conclusion

The study was carried out to identify the extent of application of e-learning in teaching agricultural science in senior secondary schools in Nsukka Metropolis. The extent to which e-learning

was utilized were ascertained in lesson preparation, lesson delivery, lesson assessment. It was observed from the findings that utilization of e-learning in secondary schools in Nsukka metropolis was generally low. In lesson preparation, e-learning was only utilized in three ways. In lesson delivery, e-learning was only utilized for one purpose. In lesson assessment, e-learning was only utilized in four ways. Hence, there was need to ascertain the constraints to the utilization of e-learning in secondary schools in Nsukka Metropolis.

It was ascertained that the constraints to the utilization of e-learning in secondary schools in Nsukka Metropolis includes; inadequate qualified teachers to teach ICT in schools, inadequate computers, unstable electricity, poor maintenance culture, poor internet connection, high cost of internet services, inadequate training/retraining packages for teachers, inadequate funds for the development of e-learning infrastructures and inadequate manpower to maintain Information Communication Technology (ICT) infrastructure. Hence, the low utilization of e-learning has led to failure to achieve instructional objectives and boring classes. To mitigate these issues, some recommendations were made.

Recommendations

Based on the findings of the study, it was recommended that:

1. Curriculum planners should inculcate e-learning into all agricultural education teacher programmes to ensure that teachers are well-grounded on the ways to inculcate e-learning resources in lesson preparation.
2. The school administration should organize seminars/workshops for training/retraining of already employed agricultural science teachers on the ways of using e-learning for lesson delivery.
3. The Government especially Enugu State Government should provide the funds for the procurement of e-learning facilities like laptops and projectors for schools to ensure availability of such facilities in secondary schools for lesson assessment in agricultural science.
4. The school administration in conjunction with the state Government should employ experts who have the technical know-how for utilization of e-learning in school administration in secondary schools.

REFERENCES

- Aboderin, O.S & Kumuyi, G.J (2013). The Problems and prospects of e-learning in curriculum implementation in secondary schools in Ondo State, Nigeria. *International Journal of Educational Research and Technology*, 4(1), 90 - 96. Retrieved from www.soeagra.com/ijertIjert.htm
- Adesoji, F. F. (2012). Undergraduate students' perception of the effectiveness of ICT use in improving teaching and learning in Ekiti State University, Ado-Ekiti, Nigeria. *International Journal of Library and Information Science* 4(7), 121-130.
- Afolabi, M. (2017). Internet and internet connectivity: library services and research potentialities. In K.M Isyaku., C.M. Anikwezw., A.A. Maiyanga & M. Olokun. (Eds). *Teacher education in information technology age*. Abuja: NCCE Publishers.
- Ajayi, G.O (2012). *Information age: virtual technology opportunities and challenges to Africa*, Presented at UNESCO National Workshop on the Virtual University/Laboratory Project at the Obafemi Awolowo University, September 9-12th, 2012.
- Ajayi, I. A., & Ekundayo H. T. (2009). The application of information and communication in . Nigerian secondary schools. Retrieved January 10, 2021 from <http://www.academicjournals.org/INGOJ>
- Akinseinde, J.T (2018). JCT in the Administration of College of Education. In K.M Isyaku., C.M. Anikwezw., A.A. Maiyanga & M. Olokun. (Eds). *Teacher education in information technology age*. Abuja: NCCE Publishers.
- Amedu, S.O. (2014). Assessment of the use of e-learning facilities by home economics teachers in Delta State, Nigeria. *Journal of Education and Practice*, 5(1),207 -212.
- Angib, M. U (2019). The Family as a supportive agent computer education of a Nigerian child. *A Journal of the New Nigerian Educators*, 1(1),86-94.
- Anne, S.L & Stewart. J. (2013). Nerdy, trendy or healthy? configuring the internet cafe. *New Media and Society*. 5 (3), 35-40 .
- Atsumbe, B.N; Raymond, E., Enoch, E.B & Patrick, D (2012). Availability and utilization of e-learning infrastructures in federal university of technology, Minna. *Journal of Education and Practice*. 3 (13), 56-64.
- Egbule, P.E. (2009). *Fundamentals and practice of agricultural education*. Owerri: Totan Publishers Ltd.
- Egunsola A., Denga, L. & Pev, 1. (2014).Development and standardization of agricultural science achievement test for senior secondary school students in Taraba State, Nigeria. *Journal of Education and Leadership Development*, 6 (2), 72 - 85. DOI: 10.13140/RG.2.2.32650.47045 www.cenresinpub.org/pub/DECEMBER2014.
- Eneh, M.I (2015). E-administration implementation in Nigerian universities: Prospects and challenges. *Journal of Policy and Development Studies* 9(5),127-133. Retrieved from www.arabianjbm.com/JPDSindex.php.
- Esther. B. (2018). Information and Communication Technology and the Evolving Learning Environment. A paper presented at the Annual Conference of the National Association of Educational Media and Technology (NAEMT) held at the University of Port-Harcourt 7th November.
- Ezama, 1. O. (2017). The Place of Computer and Internet in Information Science: Implication for Teaching in the 21st Century. *Nigeria Journal of Research and Production*. 11 (2), 60- 66.
- Ezama, J. O. (2017). The Place of Computer and Internet in Information Science: Implication for Teaching in the 21st Century. *Nigeria Journal of Research and Production*. 11(2),60-66.
- Eze, O. M. & Uzoka, I. (2012). Improvement of agricultural science programme at secondary school level. *Pakistan Journal of Business and Economic Review*. 3 (1), 133 -141
- Federal Government of Nigeria (2013). National Policy on Education (6th Ed.). Lagos: NERDC Press.
- Gupta. N. (2018). *The world of internet*. New Delh; Dreamland Publication
- Ikehi, M. E., Ifeanyieze, F. O. & Ugwuoke, C. U. (2014). Integration of climate, change into the senior secondary school agricultural science curriculum in Nigeria. *Atmospheric and Climate Sciences*, 4, 614-621. <http://dx.doi.org/10.4236/acs.20014.44054>

- Madu, E.C & Adeniran, T.N (2009). *Information technology: Uses preservation of resources in library and information Centre*. Oyo: Odumat Press & Publishers.
- Mohammed, J. R (2007). The role of ICT in distance teacher education. *Journal of Faculty of Education University of Calabar on Education for Today*: 3(1), 13-23.
- National Examinations Council (2014). Reports of school accreditation for the senior school certificate examination. Minna: Author.
- Nwachukwu, C. U., Onah, F.C., Obijiofor, E.O., Nwankwo, C.U. & Nwakile, T.C. (2020). Effects of multiple teaching methods on academic achievement and interest of primary school pupils in agricultural science in Anambra State. *International Journal of Multidisciplinary and Current Research*, 8, (May/ June, 2020 issue), 415 - 420. Available at <http://ijmcr.com/effects-of-multiple-teaching-methods-on-academicachievement-and-interest-of-primary-school-pupils-in-agricultural-science-in-anambrastate/>
- Nworgu, B.G (2015). *Educational research. Basic issues & methodology* (3rd ed.). Nsukka: University Trust Publishers.
- Oyinloye, M.E. (2018). Computer assisted laboratory instructions: Learning outcomes analysis. *Journal of Research in Computing Education*. 29(4)325-337
- Oyinloye, M.E. (2018). Computer assisted laboratory instructions: Learning outcomes analysis. *Journal of Research in Computing Education*. 29(4)325-337
- Shimave, A.G., Kesiki, W.B., & Yani, J.P. (2013). An evaluation of the performance of secondary school farms in Taraba State, Nigeria. *Journal of Agricultural Sciences and Policy Research*, 3(1),28 - 45. Retrieved from <http://www.isdrejournals.com>.
- Study.com (2018). Jerome Brunner's Theory of Development. Retrieved from <https://study.com/academy/lesson/jerome-brunners-theory-of-development-discoverylearning-representation.html>.
- Tinio, V. L. (2002). ICT in education. Retrieved February 10, 2022 from <http://www.saigontre.com/FDFiles/ICTinEducation.PDF>.
- Torruam, IT (2012). Application of e-teaching and e-learning in Nigerian Educational System. *Academic Research International*, 3(1), 30-36
- Ugwu, G.C & Aleke (2009). Impediments to the utilization of e-learning opportunities in primary schools in Nsukka education zone. *Institute of Education Journal, University of Nigeria Nsukka*, 23(1), 110-122