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**UTILIZATION OF INFORMATION AND COMMUNICATION  
TECHNOLOGY AND JOB PERFORMANCE OF AGRICULTURAL  
EDUCATION LECTURERS IN TERTIARY INSTITUTIONS IN AKWA  
IBOM STATE, NIGERIA**

**Abstract:**

This study investigated the utilization of information and Communication Technologies (ICTs) and lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria. Three research questions and three research hypotheses focusing on instruction delivery, acquisition of instructional materials and conservation as well as the preservation of instructional material resources guided the study. The survey research design was adopted for the study. One hundred Agricultural Education lecturers working in both private and public tertiary institutions in Akwa Ibom State in Nigeria constituted the population of the study. Questionnaire was the instrument used for data collection. Pearson Product Moment Correlation Analysis was the statistical tool used for data analysis. The findings of the study revealed that there was significant relationship between ICT usage and lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria. It was recommended among others that agricultural Education lecturers working in tertiary institutions in Akwa Ibom State, Nigeria should be trained on the utilization of ICT in order to optimize their basic job of instruction delivery, acquisition of instructional materials and conservation as well as the preservation of instructional material resources.

**Keywords:**

Information and Communication Technology, Instruction Delivery, Instructional Material, Conservation, Preservation, Job Performance, Agricultural Education

## 1. Introduction

Information age is characterized by the free flow of information made possible with the recent adoption, application and utilization of the modern information and communication technologies (ICTs) in information management, processing, storage, retrieval and dissemination. The term Information and Communication Technologies (ICTs) is defined as a diverse set of technological tools and resources used to communicate and create, disseminate, store, and manage information (Harmon & Jones, 2009). Ajayi and Kehinde (2002) describe ICT as a system of information reception, processing, storage, retrieval and transmission by means of electronic data. ICT components include e-mail, computers, equipment and other related facets which are useful for the enhancement of information management and utilization in applicable setting. ICTs also encompass a range of rapidly evolving technologies including telecommunication technologies (telephony, cable, satellite, TV and radio, computer-mediated conferencing, video conferencing) as well as digital technologies (computers, information networks (internet, World Wide Web, intranets and extranets) and software applications (Gullion, 2000).

Tertiary institutions are established to take care of the training need of students, lecturers, researchers and other community of scholars. Their mission is to provide quality information service and knowledge products (print and electronic) to community of scholars. In order to function and provide timely information at a faster speed, administrators should realize the important roles ICTs play in the job performance of the workforce (lecturers). Most functions and services that academics in tertiary institutions used to provide manually can be provided now through the use of ICTs this can do things better and faster.

The revolution of ICT is now making great impact in all fields of knowledge including agricultural education. The advent and prevalence of ICTs have actually impacted on the job performance of lecturers of agricultural education. The technological innovation and information explosion in different formats have impacted positively on lecturers of agricultural education, especially in the use of computers and telecommunication facilities in providing services to students. Some of the opportunities presented by ICTs to Agricultural education lecturers according to Noble (2006) and Gullion (2000) are organization of information for use, capacity building, management information system, and digital academic resource sharing and document delivery.

Job performance is a well-researched concept because of its importance in determining efficiency not only among organizations, but also among individuals. This concept has been researched in terms of its conceptual and operational definitions, relationship with other variables, and effectiveness as a measure of efficiency and/or productivity in an organization. Agricultural Education lecturers' job performance conventionally connotes work related activities expected of Agricultural Education lecturers and how well those activities are executed. Many tertiary institution administrators assess the job performance of each Agricultural lecturer on an annual or quarterly basis in order to help them identify suggested areas for improvement.

Stephen (2005) submits that the use of information technology by agricultural teachers provides significant benefits in work measurement, cost reduction, productivity improvement and better services to the students.

The use of ICTs in agricultural education has been recorded. According to Alton, Williams and Millers (2003), instructional technology can be traced back to World War II when the government produced thousands of military training films. Other learning materials such as still photographs, audio recording, filmstrips, transparencies, and slides were also used for instruction as well to achieve specific outcomes in military personnel. In the 1950s, tertiary institutions started creating courses in audiovisual production. Coloured slides and easy-to-use cameras gained popularity. Mechanical systems such as LeRoy and Letterguide were commonly used in lettering posters and displays. The 1960s and 1970s saw increased use of slides and the carousel projector. The thermal process and later the electrostatic process made it easy to create transparencies from a typed page. The 1980s marked the progression from hand to computer media in instructional technology. VCRs, videodiscs, and laser printers emerged, and personal computers began to appear in schools, offices, and homes. Additional developments in the 1990s included scanners, CD-ROMs, digital cameras and the Internet. Computers have revolutionized the classroom by allowing for interactivity and creating a more learner-centered environment.

Alton et al (2003) also identified interactive computer software programs, presentation software, interactive CD-ROM programs, email, computers in the classroom, LDC panels and projectors, CAD programs, video tapes, interactive video, the Internet, and two-way interactive television as instructional technologies that show promise for school agricultural education programs.

Computers are now be used in the design, delivery, and evaluation of teaching and learning. Computerized instruction is included in secondary school agricultural education programs to teach computer literacy, a needed skill in agricultural occupations, and to enhance student learning. Agbulu and Ademu (2010) found that agricultural education teachers used computers mostly to manage grades, classes, and teaching materials. The majority of agricultural education teachers used computers for instructor-related tasks such as writing tests, creating class assignments, grading, writing correspondence, and developing curriculum. Agbulu at al (2010) identified categories of software programs used to included, word processing, graphics, spreadsheet, data base, financial, Internet navigator, drafting (CAD), and grading. In the study majority of teachers reported daily use of word processing software, database programs, and the internet, compared to weekly use of spreadsheet and graphic presentation software. The availability of e-mail and internet facilities in academic institutions offers a wide range of access to information globally without geographical barrier and timely too. In view of this, agricultural education lecturers in Nigeria now send e-mails or browse website on the internet. The use of ICT is assumed to enhance improved service delivery by agricultural education lecturers in Nigeria. ICT besides speeding up information delivery facilitates teaching, learning and research.

Job performance is arguably one of the most important variables of interest to educators, businesses, the government, and society. Researchers and businesses are just now reaching consensus on common definitions and conceptualizations of job performance. Rotundo (2000) presents an integration and summary of the body of literature that has emerged in defining job performance. Rotundo (2000) explains that although researchers provide their own conceptualization of job performance, a typical definition focuses on behaviours or actions of individuals, not results or outcomes of these actions and behaviors. She discusses some of the problems with various definitions of job performance and stresses that an accurate measure of job performance includes the direct observation of behavior. She also suggested that job performance should be defined in terms of behaviors rather than results. She also defines performance as behaviors that are related to the goals of the organization. Ben (2010) defines performance as those actions or behaviors under the control of the individual, that contribute to the organization's goals, and that can be measured according to the individual's level of proficiency, a definition that is consistent with the others. The definitions of job performance reviewed here have some common features. These features include a focus on behaviors that are under the control of individual not results and on behaviors that contribute to the goals of the organization. Job performance needs to be differentiated from other measures of performance that are sometimes used interchangeably, often incorrectly so. Unlike performance, this focuses on actions and behaviours, individual effectiveness as an evaluation of the results of an action. Productivity is another term that is often confused with job performance. Productivity has been defined as the ratio of outputs relative to inputs into some production process (Neelmeghan, 2008). Outputs can include the number of units produced, the quality of the units produced, where inputs can include raw materials or time. Neelmeghan cautions against its use as an index of job performance because it reflects a different construct. Researchers strongly recommend that performance be defined in terms of behaviours that are under the control of the individuals and that contribute to the goals of the organization

Although it is common to find job performance, effectiveness, or productivity used interchangeably, this practice is inappropriate as these terms reflect different aspects of employees or the organization performance. Rotundo (2000) argues that job performance in this definition includes a wide range of job behaviors and that some behaviors contribute to the employee's duties and responsibilities, while other behaviors still affect the goals of the organization but do not fall under duties and responsibilities. Researchers have attempted to classify the behaviors into different components of job performance. These are communication, job knowledge/skill, productivity, client and user focus, technology skill, problem solving, interpersonal relationship, team work, flexibility, creativity and innovation, and dependability

Job Knowledge skills refer to certain job competencies necessary for the effective completion of job tasks and responsibilities. While this will vary from position to position, judge whether your employee is meeting standards in key areas. Communication is an essential part of every job and should be a key performance indicator in your employee evaluations. Here how well a staff communicates with

clients and colleagues is the focus. It can be defined in terms of interpersonal communication skills, written and verbal skills. In decision-making behaviour, employee is ranked on how he/she fares in this area by evaluating major or difficult decisions that have been made during the previous assessment period. It considers whether an employee regularly approaches management or colleagues for assistance in choosing a path to pursue, or if he/she is confident and makes well-educated decisions on her own. Work habits focuses on staffer's work disposition, including time management, meeting deadlines, arriving for work on time and being reliable. This will help evaluate not only whether the staffer understands the responsibilities of his/her job, but carries them out in an efficient and consistent way on a daily basis. There is tacit consent that a relationship exists between use of ICTs and job performance of agricultural education lecturers. It is pertinent to empirically confirm this fact. This is the crux of this study.

## **2. Statement of the Problem**

In every tertiary institution offering agricultural education as an area of discipline, lecturers play important roles and act as pivot for learning. The duties of lecturers include among others instruction delivery (teaching), evaluation and research. Until recently, agricultural education lecturers in tertiary institutions in Akwa Ibom State, Nigeria depended almost entirely on the manual method of performing their professional teaching jobs with its attendant inadequacies. Such adverse consequences include the use of ineffective instruction delivery, mutilation of examination and other academic records, fruitless efforts at tracing and acquisition of some instructional materials leading to time and energy wastage as well as difficulty in retrieval of important information and documents. The conventional method is also subject to perennial backlogs and errors in service delivery. Hence the agricultural education lecturers get so fatigued and often end in frustration, resentment and ultimately poor academic performance by students.

Presently, ICTs have become major tools for performance of teaching duties. The advent of the digitization, have enhanced the access of instructional resource materials from remote locations by agricultural education lecturers. To enhance the performance of their professional work role, agricultural education lecturers are now trained to develop the competencies to carry out effective searches on CD-ROMs, on the web and other electronic databases. Specifically, they are made to acquire ICT skills in database management, web development, management of multiple media, metadata skills, word processing skills, spreadsheet skills, database skills, electronic presentation skills, web navigation skills, website design skills, e-mail, management skills, windows explorer skills, Consequently, agricultural education lecturers are expected to utilize ICT in the performance of the jobs of acquisition of instructional materials, online information retrieval, electronic document delivery through internet and personal web portal, and preservation of instructional aids.

With this, significant changes and improvement is expected in their job performance. As pointed out by Adedoyin (2005), the application of ICT has caused significant fast changes in lectureship, where digital and electronic software complement, and in some cases replace traditional settings. The problem is that

agricultural education lecturers who are confronted with this radical change experience shock, confusion and become disoriented (Adedoyin, 2005). In other words, some agricultural education lecturers are still out of touch with reality of utilizing ICT in the performance of their work roles. This is why the researcher wants to find out the extent to which utilization of ICTs has related to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria.

### **3. Purpose of the study**

The main purpose of this study was to examine the relationship between utilization of information and communication technology and job performance of agricultural education lecturers in tertiary institutions in Akwa Ibom State. The specific objectives of the study were:

1. To find out if the use of ICT for instruction delivery relates to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria
2. To find out if the use of ICT for acquisition of instructional materials relates to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria
3. To determine if the use of ICT for the conservation and preservation of instructional materials resources relates to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

### **4. Research questions**

The following research questions were posed to guide the study:

1. To what extent does the use of ICT for instruction delivery relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State Nigeria?
2. To what extent does the use of ICT for acquisition of instructional materials relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria?
3. To what extent does the use of ICT for the conservation and preservation of instructional materials resources relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria?

### **5. Statement of hypotheses**

The following hypotheses were formulated to guide the study:

1. The use of ICT for instruction delivery does not significantly relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria.
2. The use of ICT for acquisition of teaching materials does not significantly relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

3. The use of ICT for the conservation and preservation of instructional materials resources relates to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

## **6. Literature review**

### **6.1 Utilization of ICT for instruction delivery and agricultural education lecturers' job performance**

During the past few years, the world has witnessed a phenomenal growth in communication technology, computer network and information technology. Development of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technology tools for instruction delivery in academics. The ICT offers unprecedented opportunities to the education systems with its capacity to integrate enhance and interact with each other over a wide geographic distance in a meaningful way to achieve the learning objectives. The growth of these communication and computer systems, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom (Majumdar, 2009). It has the potential to transform the nature and process of the teaching and envision a new instruction delivery culture. Interactivity, flexibility and convenience have become the order of the day with the ICT supported environment. ICT opens up opportunities for instruction delivery because it enables instructors to access, extend, transform and share ideas and information in multi-modal communication styles and format. It helps the instructor to share learning resources and spaces, promote learner centered and collaborative learning principles and enhance critical thinking, creative thinking and problem solving skills (Resta, 2002).

According to Resta (2002), education around the world is experiencing major paradigm shifts in educational practices of teaching under the umbrella of ICT enabled learning environment. Whereas teaching by imparted facts, drill and practices, rules and procedures was more adaptive in earlier days, learning through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection is perhaps more fitting for the present times. The major hallmark of this transition is from teacher centered to learner focus paradigm. He pointed out that during the last three decades; the changes in educational environment have been phenomenal. The model, focus, role of the learner and technology has been changed drastically from traditional instruction to virtual learning.

Arguing in support Majumdar (2009) said that shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in roles of both teachers and learners. The role of the teachers will change from knowledge transmitter to that of facilitator, knowledge navigator and sometime as co-learner. The new role of teachers demands a new way of thinking and understanding of the new vision of learning process. Learners will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others (Ng, 2005). ICT provides powerful tools to support the shift from teacher centred to learner centred

paradigm and new roles of teacher, learner, curricula and new media. Majumdar (2009) presented and described the major shifts in a tabular form below:

### Changes in Teachers' Roles

From	To
Transmitter of Knowledge	Guide & Facilitator of Knowledge
Controller of Learning	Creator of Learning Environment
Always Expert	Collaborator & Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Didactive/ Expository	Interactive/Experiential/Exploratory

Source: Majumdar, 2009

On application of ICT in instruction delivery, Zhu (2003) pointed out that mere learning ICT skills is not suffice, but using ICT to improve the teaching is the key for pedagogy-technology integration. But the question is how we can combine these two. For a teacher who is using ICT for his daily classroom activities of teaching and learning, Zhu (2003) advised inter alia: To start with, he or she needs to prepare lesson plans and compile lesson materials for the classroom lecture. To prepare such materials one has to go through the act of drafting phase, editing phase, revising phase and finally publishing the lesson plans and course contents. Word processor can be a great help to accomplish this task in a professional and productive way to avoid repetition, duplication of manual work and concentrate on quality of the course materials. The teachers also need to make lists of the name of the students for monitoring and recording their academic performance and to analyze and perform a statistical analysis to take some corrective measure if any, in the lesson plan, delivery of instruction. Spreadsheets can be a good choice for creating class lists, recording their performance and executing statistical analysis upon them. While delivering the class lectures, any innovative teacher needs to draw diagrams, show pictures, animate some objects to explain critical concepts, even play some video clipping of real time operation. All these multimedia applications can assure very productive, interesting, motivating, interactive and quality delivery of classroom instruction. Zhu (2003) opines that presentation software like power point can be a good choice for teachers for performing such tasks.

Witfelt (2000) in another vein pointed out that in spite of the best efforts of teachers, there will be a number of learners who will not be satisfied with the pace of instruction of the teachers. There may be a fast learner, average learner and slow learner. In a classroom environment it is impossible to satisfy all categories of learners with their specific learning styles. It is in these situations, teachers become helpless in a conventional teaching and learning environment. One way to solve such situations is to create interactive multimedia based instructional materials where learner is given control to review the topic at their own pace and in accordance to their individual



interests, needs and cognitive processes. As such, multimedia course wares are usually great help to teachers to meet the challenges of such situation. With availability of user friendly authoring tools, it is now possible to develop multimedia courseware by any teachers to support drill and practice to master basic skills, simulate complicated situations, produce individualized instruction with multimedia elements with built-in evaluation questions and scores. Such multimedia courseware can produce profound changes in the learning outcomes when it is being used along with face-to-face instruction.

Resta (2002) in a collaborative contribution said that learners always look for flexibility in time, space, place, content selection and delivery of instructions. He noted that it was quite impossible to satisfy such requirements in earlier times due to the non-availability of proper tools. However, it is now feasible and possible to implement open and flexible learning strategies using ICT as tools. Flexible access to content and learning resources via network across conventional class rooms, homes and community centers is the defining characteristic of what has come to be known also as distributed learning. Learning anytime, anywhere with synchronous and asynchronous communication across space, time and pace is the key to web based instruction. With the availability of online tools, it is now possible to create content websites, online education to support and assist face to face instruction in an innovative way. Communication with e-mail, searching for information, locating a proper website is now the key to success. Resta (2002) noted that developing online and offline learning resources using various learning management system software/tools will become one of the key competencies of modern day teachers.

Queenland (2012), in a commissioned study on ICT application in teaching and learning identified the following practical ideas for teaching in digitally rich environments

- i. Games-based learning where teachers encourage students to engage in play-based tasks or create their own games in order to develop knowledge and skills
- ii. Problem-based learning where teachers encourage students to work to solve challenging, real-world or life-like problems related to subject disciplines.
- iii. Students leverage where teachers encourage a range of traditional and digital tools to create and publish their work to a wide range of audience using edTube and edStudio. Personalised learning community in which teams of teachers work together to facilitate a differentiated environment supported by dynamic learning spaces and eSpaces
- iv. Teachers create and publish digitally-rich products and continually demonstrate digital literacies and independently authenticate, critically evaluate and select relevant information and resources.

- v. Virtual role-play where teachers encourage students to take on the role of a character or prominent figure and interact with others in an iConnect web conference or create a mock online profile within an edStudio
- vi. Peer tutoring where teachers encourage students use expert peer tutors to develop aspects of their digital literacy and scaffold their completion of digital assessment tasks.
- vii. Dialogue which after establishing working protocols, teachers and students participate in substantive conversations with peers using online discussion boards to develop and clarify understanding of concepts and receive constructive feedback.
- viii. Online debate where teachers encourage students to engage in robust conversations to argue opinions and make decisions using the Learning Place student space blog tools Teachers and students use hashtags to easily sort and access peer blogs relevant to their discussion.
- ix. Group work where teachers encourage students to work in small groups where individuals are responsible for part of the learning, leveraging online resources and learning scaffolds
- x. Teachers encouraging students to teach others in the group core knowledge and skills.
- xi. Virtual field experiences where teachers encourage students to engage in virtual field trips through the Learning Place to participate in rich, real-world learning experiences.
- xii. Reverse instruction where teachers encourage students to develop core knowledge and skills for homework through teacher and student-captured explicit instruction, shared through edTube at the Learning Place.
- xiii. In-class where teachers encourage student to focus on higher order tasks, substantive conversations and monitoring assessment
- xiv. Explicit instruction where teachers encourage students to engage with structured teacher modelling and delivery of core knowledge and skills enhanced by digital technology
- xv. Drill and practice where teachers encourage students to develop understanding of essential knowledge through repetitive tasks supported by learning objects, online games or peer-created quizzes and interactive resources

ICTs are used in the design, delivery, and evaluation of teaching and learning in agricultural education programs to teach computer literacy, a needed skill in agricultural occupations, and to enhance student learning (Alton et al 2003). Alton et al (2003) found that agricultural education teachers used computers mostly to manage grades, classes, and teaching materials. They also found that the majority of teachers used computers for instructor-related tasks such as writing tests, creating class assignments, grading, writing correspondence, and developing curriculum. Williams (2001) studied types and frequency of software used by agricultural education teachers in teaching process. He found out that the categories of software programs used included: word processing, graphics, spreadsheet, data base, financial, Internet navigator, drafting (CAD), and grading. The majority of teachers reported daily use of word processing software, database programs, and the Internet, compared to weekly use of spreadsheet and graphic presentation software. ICT can be used in conjunction with experiential education - e.g., supervised agricultural experience programs that help learners form their own meaning of the world around them, applying threads of constructivism (Alton et al 2003).

Murphy and Terry in Alton et al (2003) conducted a nationwide study on the potential positive effects that ICT have on agricultural education instruction delivery. Findings tended to clustered in four areas: (a) an increase in the availability of educational opportunities, (b) improved information for teachers and students, (c) more effective instructional materials, and (d) more convenient delivery methods for teachers.

## 6.2 Utilization of ICT in acquisitions of instructional materials and agricultural education lecturers' job performance

Conventionally, acquisition is primarily concerned with ordering, claiming and receipt of materials. It could be defined as the process of securing materials for whether by purchase, as gifts, or through exchange programmes. Williams (2001) sees it as the means by which additions are made to the material resource of agricultural education. One can also view acquisition as a task of obtaining or acquiring materials by purchase, gift, exchange or borrowing as an addition to the stock of material resource of agricultural education in order to satisfy the instructional needs of the students.

Omoniwa (2005) in his study on the contributions of ICT to acquisition and effective instructional delivery in Nigeria universities used a sample population of all professional agricultural educators drawn from 20 randomly selected federal and state universities in Nigeria. The finding of the study revealed that ICT acquisition and application in academic institutions have the potential to offer innumerable benefits to the professionalization of lecturers in Nigeria by enhancing acquisition of instructional materials. He also found out that the academic environment is in a state of transition in terms of resources and users. Many instructional sources once available only in print are now also available in CD-ROM for acquisition online, and in electronic form.

Thus with information communication technologies, electronic acquisition of materials is now available.

The instructional materials acquisition process is a task which involves steps such as, request processing, and preorder work/bibliographic verification and ordering. In view of this, Alabi (2005) advised that acquisition of instructional resources should be rationalized to ensure its optimum utilization among patrons. That, instructional resources in university should be harnessed by repackaging by using most efficient and effective processing technologies available so as to deliver appropriately targeted resources to all categories of students.

Ajayi (2002) in support of this view asserts that the introduction of automation in academics was a means of up-dating instructional material collections, and that most book publishers and educational and instructional materials vendors now operate online as they send their e-mail of available materials online to be assessed by either or both the university acquisition personnel who assesses such stock and gives approval as to needs before supplies are made. He maintained that the instructional materials acquisition activities that were carried out manually in universities with so much stress and strains are now being carried out smoothly with the help of ICT with greater effectiveness. Organization, administration and other technical processing associated with instructional materials acquisition have become easier and a quantum of work in this wise can be done with utmost effectiveness. He maintained that arrangements for acquisition of relevant library books/journals between publishers and library managements can well be achieved through ICT. Efficient ICT system according to Aina (2004) is also vital for the current agitation for resource sharing in areas of institutional cooperation and inter-institutional loan. Availability of good telecommunication systems in our institutions is a huge relevance to different parts of the world to have direct access to instructional resource reserves in order to know which instructional and research material are available in a given institution.

Rayan (2004) in a study on role of internet in discharging agricultural educators' functions confirmed that internet is playing an important role in discharging the functions of agricultural educators. He opined that internet is changing the ways the agricultural educators organize, manage and disseminate information. With more and more documents getting published electronically and internet resources growing at 18% a month, agricultural educators of 21st Century will have to shift towards electronic means of acquiring, processing and disseminating instructional material source information. Today all sorts of instructional material source services from acquisition to delivery can be offered through the internet.

Rayan (2004) emphatically mentioned acquisition of document as one of the most important instructional material source services that can be offered through the internet. According to him, internet has made simple and speedy purchase of instructional material sources/documents like books, journals and electronic publications. A number of commercial databases are available for the agricultural lecturers to exploit viz the CAB abstracts, Agricola, Medline, Agris, Biological Abstracts, Compendex, etc. of Dialog and BRS Information Technology. Most of the publishers and booksellers have their web sites on the internet and place their regular

catalogue and leaflets of new publications. Some of the publishers of primary journals like American Chemical Society, IEEE (USA), and Elsevier Science Publishers are providing their journals online. The IDRC, Canada is providing books on research and development that can be ordered online through the URL <http://www.idrc.ca/bookhque>. IDRC also publishes its best reports online which are available at web site <http://www.idrc.ca>. CAB Publishing has recently launched a series of subject specific online communities catering to the needs of lecturers and researchers, each community will feature comprehensive abstract databases with 25 years archive. Examples of some of the useful set of links available through the internet for instructional material acquisition enumerated by Rayan (2004) are:

- i. Association of learned and professional society publishers, <http://www.alsp.org.uk/member.html>
- ii. Ingentia Journals provides access to bibliographical information from more than 550 journals from Academic Press, Royal Geographical Society, White House Press and Harwood Academic, etc. and can be searched without restriction <http://www.ingentia.com>
- iii. ARL Directory of Electronics Journals produced by Association of Research Libraries gives information on electronic 20 journals and newsletters along with details of the subscription.
- iv. Britannica Online offers the world's first online encyclopaedia. The tertiary institutions can provide access to the readers by paying some registration fee. The Britannica Online has advantage of accessing articles not yet in print, and Britannica Book of the Year <http://www.eb.com/>
- v. Amazon.com books web site provides access to greater selection of books with over one million titles which is searchable by keywords, author, title or subject. The site also has provision for purchase, via Netscape's secure commerce server or over the phone. <http://www.amazon.com>

The agricultural lecturers can easily browse through the current publications available on various web sites in their area of interest, confirm the prices, etc. and place orders online. Any discrepancy in the invoices or bills, edition of books, printing, etc., can be clarified within minutes through e-mail and much of the paper work is reduced. It is estimated that within the next 5-6 years the internet will become the mechanism for distribution of three quarter of the specialized journals and also the major medium for transfer of research information.

According to Gleen (2004) internet has become the primary mode of communication which carries more than the combined total of the postal services of all countries in the world put together by the turn of the century. It is an important means of communication which provides a cheap and efficient means of mail transfer. Agricultural education lecturers can use this facility extensively to communicate with the publishers, book sellers and vendors of the other instructional material sources

across the globe. The most popular means of communication on the internet is e-mail. Like the regular mail, there are also mailing lists to address groups of people. These mailing lists often can serve a valuable resource for the agricultural lecturers.

With the advent of internet, major digital settings holding instructional material sources are now available online through internet and hence directly accessible from any part of the world. Lecturers can have access to the catalogue of various libraries attached to the universities and colleges in the world and accordingly place a request for their users. The increase in the cost of instructional material resources for agricultural education disciplines in recent years has meant that the libraries have been able to provide less and less access to research literature through their in-house collection. Also with the financial constraints, the agricultural education lecturers are seeking alternative means of providing access to instructional material resources. The problem of print journal and the concomitant development of computers and communication technologies have led to the development of electronic alternatives to print journals, i.e., in various forms of electronic journals. Recently a number of publishers have agreed to offer their journals electronically to libraries through First Search Electronic Collection Online. This enables the libraries to subscribe a large collection of academic journals from many publishers from a single www interface that support cross journal searching and extensive browsing. According to Noble (2006) First Search Electronic Collection Online is one of the first online systems to address the key issues necessary to make the transaction from paper to electronic journals. The system can accommodate thousands of journals and tertiary institutions can choose the journals they want to include in their electronic collection and journals will be loaded in their entirety on or before their publication date.

Lecturers using Electronic Collection Online can access them remotely through World Wide Web. The users will be able to search and browse citation from journals, abstracts and complete articles from journals subscribed by their academic institutions. Further this service combines the cost benefit associated with remote access to data with the advantage of local collection management. Schuman (2006) suggested that lecturers can play an important role in disseminating information by creating their web site. Through their sites he maintained, they can inform about various services, products, events, and courses offered by them. The most important point for lecturers in designing a web site as enumerated by Schuman (2006) is to consider primary audience and provide information relevant to their instructional material resources needs. Since most information is generally available in other sites, the lecturers' role gets emphasized in organizing the information in their web pages and by providing links utility as they save time over the print volume and money over the online databases. In essence, combining information or links to other information in ways not previously done can add value to the information and consequently to the web site. To provide easy access to the instructional material resources websites the lecturers need to heed on some basic rules. These rules as enumerated by Schuman (2006) are as follows:

- (i) The Uniform Resource Locator (URL) of the website should be related to the subject content, easy to remember.
- (ii) The files should be short to ensure fast loading. The web pages often load slowly because the file is too large or contain too many pages in this case the file may be split into multiple files to give easy access to the file.
- (iii) The information in the web pages should be categorized for clarity using headings, breaks, paragraphs, etc. which can be done by using HTML codes.
- (iv) To ensure the audience to quickly ascertain what specific information the library web pages provide, the pages must be provided with the explanatory notes.
- (v) The lecturers also need to provide brief, clear and informative statement regarding the content of their web pages in the web site so that effective hyperlink can be provided.
- (vi) Lecturers while designing their web pages should try to provide as much original material as possible.
- (vii) Although web pages provide list of hypertext link to remote or documents located on other servers can be dangerous as servers may crash or there may be a change of address. Under this situation the users may receive 'file not found'. If there are too many concurrent users on the distant server the audience will have to wait longer to access the file.
- (viii) The lecturer should try to provide as much original information as possible. Original material refers to the text file containing hypertext documents located on their own server.
- (ix) To house material on the lecturer' server, it has to be typed, scanned or copied, then converted into hypertext format.
- (x) Having too many full text documents the server could also create traffic congestion because the individuals will access the server for longer period of time.
- (xi) The lecturers should strive to provide a mixture of hypertext links to documents owned by others and full text documents located on one's server. This mixture gives the web pages more credibility and adds value to the information while decreasing the frustration resulting from too much reliance on other websites.
- (xii) The lecturers should also provide mechanisms for communicating with their users and moving them between their web pages, generally when individuals read books they often have question such as when it was written how to contact the authors, whether new editions are forthcoming or where other similar books are located.

- (xiii) The lecturers can also monitor the usage of their server and particular files by placing counter software in the home page. Counter software monitors traffic on the server, and provides periodic statistical reports summarizing which file are being accessed most and redefine their web page to meet the reader's needs and strategically place administrative links on highly used pages.
- (xiv) Similarly, the audience response and statistical feedback enable the lecturers to create new titles and include statements like date of modifications and like 'What's New' and date of last modified hypertext links. Date last modified gives credibility to the web files.
- (xv) To keep the audience aware of new material, lecturers may include links to those materials at the top of the home page and other heavily used pages. This provides greater access to new materials and allows promotion of continued growth of web sites.
- (xvi) Once the links are placed, the lecturers should also consider the aesthetic appearance of the web pages since the colour, text, hypertext links and background, etc. generally influence the use of the web site.
- (xvii) The lecturers need to effectively publicize their web site through forums to which the users pay particular attention. Newsletter and electronic discussion groups may be used for this purpose.
- (xviii) Publicizing the web site to diverse audience users, lecturers can register their web sites URL with major search engines like Yahoo, Google, Bing etc. and providing brief descriptions of their contents.

Aina (2005) study reveals that some lecturers in Nigerian universities use the internet in instruction delivery. Lecturers use internet to access research materials and e-mail. On the impact of the internet on lecturers' job performance, the findings revealed that the internet contributed significantly to the ease of work done by the lecturers; that the internet has broken down barriers of communication and information access from anywhere in the world. It is fast reliable and does not have restrictions on content or format. He found out also that the internet had become a vital instrument for teaching, research and learning process and also noted there are great benefits of the internet over conventional documents.

Kumar and Kaur (2005) in their study examined internet use on teaching by academic staff of the University of Technology in Nigeria. The analysis revealed that academic staffs use internet service for research and teaching purpose. Also Aina (2005) pointed out that, internet is well-established feature in many renowned universities and this has impacted positively on the changing role of lecturers as observed in the areas of instruction delivery, instructional material resource collection, development and acquisition. He added that internet has greatly enhanced the efficiency and effectiveness of lecturers. Among the greatest benefits of internet services is the inexpensive way in communicating with others worldwide (Lee, 2006).



### 6.3 Uses of ICT in conservation and preservation of instructional material resources and agricultural education lecturers' job performance

Preservation is the task of minimizing or reducing the physical and chemical deterioration of documents. Agricultural education lecturers the world over are tasked with the responsibility to acquiring, processing, disseminating instructional material resources to students, and due to constant usage of these materials the rate of degradation increase. Jordan (2008) describes preservation as an umbrella term for an array of activities, principles, practices and organizations that ensure the usability, longevity and accessibility of recorded knowledge. According to Rudra, Singh, and Daimari (2009), Agricultural education lecturers currently face the intellectual problems of determining what should be preserved and what should be left to deteriorate among the arrays of instructional material resources available for teaching learning activities. To make information accessible agricultural education lecturers are in dilemma in preserving sources of information which can't be stored away or conserved in an ideal and secure environment to arrest their decay (Rudra, Singh, & Daimari, 2009). Preservation problems are pushing collection lecturers into a more activist role, in which they make crucial preservation decisions to ensure that these valuable resources are well preserved for future generation to avoid extinction

Muhammad (2006) states that light from incandescent source generate heat and must be kept a distance from instructional material resources collection. Blinds and shutters completely block out light from the sun, thus aid in temperature control by minimizing heat loss and generated by sunlight during the day. Filters made of special plastics help control Ultra violet (UV) radiation, and the use of special low UV florescent tubes is very important. Adcock (2008) states that pollution is important not only because of the physiological effect it has on users, but due to its deteriorating effects on instructional material resources. Satyaanarayana, (2009) identifies moulds as the most important bio- deteriorating agents of instructional material resources. In addition to destroying, disfiguring and staining instructional materials, the moulds have been linked to numerous adverse human health effects that fall into three categories: allergic, toxic and infectious. The other biological agents include bacteria, insects and rodents (Lee, 2003).

Though several approaches for digital preservation of instructional material resources have been identified and presented, conventional methods are mainly technology emulation, information migration, and encapsulation. Agricultural education lecturers can store digital instructional material resources on any medium that can represent their binary digits or bits, such as a CD-ROM or a DVD. Schuman (2006) pointed is increasing ten-fold each year in a relatively uncontrolled open environment. Thus, not only must these be preserved but also the means to access and view the information must be preserved alongside it. This means that a range of appropriate hardware platforms, systems software and viewing browsers will need to be retained and maintained for consulting historical materials long after they have been superseded by more technically advanced versions for current use

One of the major crises facing instructional material resources throughout the world is the rate of deterioration of the collections. Every instructional material resources is prone to two kinds of deterioration: biological deterioration caused by insect's attack/fungi growth or environmental deterioration caused by extreme dampness wide fluctuation of relative humidity, variations in temperature, light and atmospheric pollutants (Muhammad, 2006). The collection of modern instructional material resources such as sound tapes and electronically stored information such as CD-ROMs and computer discs is growing rapidly and almost all of most collection is essentially impermanent. Preserving for the sake of preserving is useless and giving access lavishly to all instructional material resources without taking into account, preservation measures will sooner or later lead towards making the instructional material resources without heritage inaccessible for future generations (Neelmeghan, 2008).

Conservation and restoration are the most central activities of preservation. They are concerned with the physical maintenance and repair of documentary instructional material resources. According to Satyaanarayana (2009) conservation is a field of knowledge concerned with the coordination and planning for the practical application of the techniques of binding, restoration, paper chemistry, and other material technology, as well as other knowledge pertinent to the preservation of archival instructional material resources. Conservation can be further characterized as both preventive and remedial. Preventive conservation consists of indirect action to retard deterioration and prevent damage by creating conditions optimal for the preservation of instructional material resources. On the other hand is remedial conservation, which consists mainly of direct action carried out on instructional material resources in order to retard further deterioration.

Although an increasing quantity of instructional material resources information is captured at its sources in electronic format, a significant percentage of instructional material resources especially archival documents are kept by solely in paper form (Nwamba, 2002; Satyaanarayana, 2009). In fact, until recently, paper was the most common medium available for document creation by teachers (Nwamba, 2002). Even documents created in electronic formats by word processor are usually printed on paper for reference, distribution, or filing. Preserving and conserving these materials face lot of problems in instructional material resources holdings at varying levels. Notably among these problems are that instructional material resources, especially paper-based are acquired without allocation of adequate resources, (financial and human) to address their future deterioration, lack of proper recognition of the need for preservation, conservation and restoration of instructional material resources. Most instructional material resources managers fail to realize that preservation and conservation of instructional material resources is a generally low awareness about preservation issue especially on the corruptible tendencies of materials and what could be done to prevent their deterioration. In some cases, universities do not have

preservation policies and as a result, there is neither preservation plan nor program to ensure safekeeping of instructional material resources.

Rudra, Singh, and Daimari (2009) carried out a study on the extent of use of ICT in the preserving and conserving instructional material resources in the tertiary institutions. The result shows that “books becoming torn” is the highest nature of degradation of print instructional material resources in the surveyed university. This was followed by “Brittle instructional material resources” and “Damaged instructional material resources” while “mutilation of instructional material resources” was next. The least nature of degradation of instructional material resources especially print information materials was “vandalization of instructional material resources”. The result also revealed that the highest degradation of non-print instructional material resources in the university was “cracking and scratching” of sound and optical discs followed by “changing of colour image in photographic materials” and “surface blemishes leading to fading” was next. The result further revealed that “loss of data on magnetic media”, are the least degradation of non-print instructional material resources in the university. Besides, the highest coefficient value of degradation of non-print instructional material resources is cracking and scratching which implies that loss of data on magnetic media, distortion of sound quality on magnetic media; fungi on disc and permanent deformation of sound discs were the least problems facing non-print instructional material resources in the selected universities.

The result of the study also indicated that wear and tear was the major cause of deterioration of print instructional material resources. This was followed by high acidity level while high temperature level was next. However, the least causes of deterioration of print instructional material resources are bad storage and excessive light. The major cause of deterioration of non-print materials was dust followed by high humidity and heat while moisture was next. The least measures of deterioration of non-print instructional material resources are magnetism, biological agents and excessive heat. This revealed that the least problems facing non-print instructional material resources in the selected Universities were magnetism, biological agent and excessive heat while the major cause of deterioration was dust due to lack of air – condition in the storage facility.

On the performance of the work role of lecturers in the conservation and preservation of instructional material resources, the result of the mean and standard deviation of the various parameters showed that the majority of preservation and conservation techniques of print and non-print materials in the selected universities were by cleaning and dusting these materials. This was followed by photocopying the materials to have duplicates while re-binding, shelving to allow free flow of air and provision of adequate security. However, the least techniques of preservation and conservation of print and non-print instructional material resources were microfilming and the use of insecticide and insect repellent. This situation revealed that the most useful strategy used in preserving and conserving print and non-print instructional

material resources were cleaning and dusting, while the least used was microfilming which implied that though there are some strategies in preserving and conserving instructional material resources, not all the strategies are adopted.

The result on the use of ICT in digital preservation in the instructional material resources was refreshing. It was revealed that ICT was occasionally used by only 53.3 percent of the tertiary institutions investigated. This was followed by technology preservation which was occasionally used by 40.0 percent of the universities investigated. Migration was also used although it was used by 26.7 and 20.0 percent occasionally. Result showed further that microfilming (0.40), Emulation (0.80) and encapsulation (1.00) were seldom used. The highest coefficient value of digital preservation techniques used was refreshing and it was above average, while the other variables were below 30 percent, which implied that digital preservation was not widespread in use in the selected university while some did not even practice it at all.

Rudra (2009) pointed out the need to adopt the digital method in the preservation of instructional material resources. He added that digitization has been widely canvassed as one solution to the problem of instructional material resources preservation. However, in most tertiary institutions where funds are meager, adopting digital preservation techniques and strategies should be approached with caution since digitization is tremendously expensive. For all practical purposes, digitization is costly to implement. The costs are in the form of hardware and software, user training requirements, manpower to sustain the system, converting archival instructional material resources to machine – readable form and maintenance. At times, huge digital instructional material resources can also be expensive to store and difficult to transfer. Many digital technology enthusiasts however often ignore these cost implications. In addition, there should be adequate and trained manpower for preservation and conservation programmes and activities to succeed because preservation and conservation activities are specialized and require specialized manpower with adequate knowledge of ICT and understanding of the physical and chemical nature of the instructional material resources to perform effectively.

Ajibola and Tihamiyu (2002) held that the 21 century convergence of computers and telecommunications made global information possible and this had an impact on all areas of human endeavour especially library information storage and its retrieval. Global information enables libraries to network and provide access to remote electronic database thus making a wide range of services and products available to library users.

Olatokun (2011) also carried out study on the various techniques used in the preservation of instructional material resources in selected university in Nigeria and particularly examined the causes and strategies used in their control. Findings revealed that preservation techniques, though adopted by university were not effectively in use although the universities all have preservation policies. The study established that there are indeed incidences of deterioration, the most prominent

results being books becoming torn and cracking and scratching. Further result showed that though some of the universities studied adopted and used some digital preservation techniques, they are still not effectively used. Ajayi (2011) in his publication agreed that the preservation capacity with the development of the diskette take a large amount of information with minimum ease. He also asserted that preservation in of instructional material resources has moved largely from print media to magnetic disc and optical disc and points out that microforms offers impressive packaging densities for preservation of instructional material resources but CD-ROM technologies is perhaps the most impressive preservation technologies today as it can preserve large amount of data on metallic disc similar to audio compact disc.

### **1.6 Methodology**

The research design adopted for this study was the survey research design. The area of this study is Akwa Ibom State, one of the 36 states of the Federal Republic of Nigeria. There are five universities and one College of Education located in the state. The population of the study consisted of 100 agriculture lecturers working in tertiary institutions in the State. The study adopted simple random sampling technique to select the respondents involved in the study. The instrument that was used for collection of data for the research was a questionnaire called Information Communication Technologies Use and Job Performance Questionnaire (ICTUJPQ). This was a 30 – item questionnaire divided into three sections. Section A contained information on demographic data of the respondents. Section B elicited information on the use of ICT for instruction delivery, acquisition of teaching materials, preservation and conservation of instructional materials and agricultural education lecturers' job performance. Cronbach Coefficient Alpha Method was used to estimate the reliability of the instrument and this yielded correlation coefficient which ranged from 0.65 – 0.95. These reliability estimates were considered appropriate and suitable in terms of internal consistency of the instrument.

The data for the study was collected by serving questionnaire to respondents in the tertiary institutions being studied. Mean, standard deviation and Pearson Product Moment Correlation analysis were the statistical tool used for data analysis. Pearson Product Moment Correlation analysis statistical tool was used to test the hypotheses of the study. Responses which were assigned nominal values were scored as follows: Strongly Agree (SA) - 4 points; Agree (A)- 3 points; Disagree (D) -2 points; and Strongly Disagree (SD) - 1 point. On decision rule, a response with a mean score value of 2.50 and above was regarded as agree while that with mean response below 2.50 was deemed disagree. The decision rule with respect to acceptance and rejection of the hypothesis was applied as follows: where the recorded calculated r-value was greater than critical value, the hypothesis was rejected. Also when the recorded calculated r-value was less than critical value, the null hypothesis was retained. All hypotheses were tested at 0.05 level of significance.

## 7. Results

Research question one

1. To what extent does the use of ICT for instruction delivery relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State Nigeria?

**TABLE 1:** Mean ratings of respondents on the use of ICT for instruction delivery and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

s/n	Utilization of ICT for instruction delivery	$\bar{X}$	SD	RMK
1	I use ICT-based security gadgets to provide adequate security in the library to prevent theft, mutilation and defacing of paper-based materials	3.50	0.53	*
2	Agricultural Education lecturers record practice oral presentations with a digital audio recorder to reflect upon and analyse for fluency and expression	3.46	0.52	*
3	Agricultural Education lecturers share their work on laptop with students using an interactive whiteboard.	3.28	0.46	*
4	Agricultural Education lecturers use a digital video camera to capture rehearsals for dramatic performances and use for reflection and to make improvements.	3.43	0.59	*
5	Agricultural Education lecturers encourage access by students of teacher-created instructional tutorials on mobile or personal media devices encouraging self-directed and personalized learning.	3.43	0.59	*
6	Agricultural Education lecturers take a series of photos with a digital camera and manipulate in Paint.NET to create a digital story, demonstrating visual literacy and to influence and position an audience.	3.47	0.61	*
7	Agricultural Education lecturers group students in pairs, encourage students to capture a video of one another during a physical activity and use freeze-frames to support biomechanical analysis.	3.37	0.56	*

Note:  $\bar{X}$  = Mean, SD = Standard Deviation, \* = Agree, Aggregate mean score = 3.42

Table 1 presents data on the opinion of respondents on the use of ICT for instruction delivery and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State Nigeria. Respondents agreed on all the items with mean scores ranged from 3.28 - 3.50. The aggregate mean score of 3.42 was obtained which was higher than the cutoff point of 2.50. Therefore the use of ICT for instruction delivery

and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State of Nigeria is incontestable. Data on standard deviation revealed that all the eight items recorded values ranged from 0.46 – 0.61, indicating that there was less variability in the opinions of the respondents.

#### Research question two

To what extent does the use of ICT for acquisition of instructional materials relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria?

**Table 2:** Mean ratings of respondents on the use of ICT for acquisition of instructional materials and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

s/n	the use of ICT for acquisition of instructional materials	$\bar{X}$	SD	RM K
8	I use internet to browse through the current publications available on various web sites in agricultural education, confirm the prices and place orders online	3.36	0.61	*
9	I purchase instructional material resources and documents like Agricultural Education books, journals and electronic publications by using ICT	3.43	0.58	*
10	I do prepare standard catalogue of information resources by using ICT	3.35	0.70	*
11	I use ICT for verification and downloading bibliographical information from other institutions	3.39	0.59	*
12	I use internet in the circulation of document within the Agricultural education libraries	3.27	0.64	*
13	Through the use of internet I do register and publicize our instructional material web site URL with major search engines like Yahoo, Google etc. for diverse audience users	3.35	0.61	*
14	I use ICT to assesses instructional material stock from the publishers' websites	3.00	0.58	*
15	I use ICT to select needed instructional material stock from the dealer's website.	3.41	0.70	*
16	I use ICT to process order for needed instructional material stock	2.92	0.59	*
17	I use ICT for bibliographic verification of the needed instructional material stock	3.10	0.64	*
18	I use ICT to place order for the needed instructional material stock	3.21	0.60	*
19	I use ICT to confirm the supply of the needed instructional material stock	3.44	0.56	*
20	I use internet to access the catalogue of various instructional material sources	3.01	0.62	*

X= Mean, SD = Standard Deviation, \* = Agree, Aggregate mean score = 3.35

Table 2 presents data on the opinion of respondents on the use of ICT for acquisition of instructional materials and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria. Respondents agreed on all the items with mean scores ranged from 2.92 - 3.44. The aggregate mean score of 3.35 was obtained which was higher than the cutoff point of 2.50. Data on standard deviation revealed that all the 20 items have values ranged from 0.56 – 0.70, indicating that there was less variability in the opinions of the respondents.

### Research question three

To what extent does the use of ICT for the conservation and preservation of instructional materials resources relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria?

Table 3: Mean ratings of respondents on the use of ICT in the conservation and preservation of instructional materials resources and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria

s/n	Utilization of ICT in the conservation and preservation of instructional materials	$\bar{X}$	SD	RM K
21	I preserve digital instructional resources in sound tapes	3.42	0.62	*
22	I use CD-ROM technologies in the storage of instructional resources	3.33	0.69	*
23	I store digital instructional resources DVD	3.28	0.69	*
24	I store digital instructional resources in flash drive	3.30	0.67	*
25	I do print on paper for reference, distribution, or filing, digital instructional resources prepared in electronic formats by word processor	3.26	0.67	*
26	I do use ICT to laminate digital instructional resources for preservation	3.31		*
27	I use microfilm technology to preserve digital instructional resources	3.43	0.62	*
28	I use ICT in binding digital instructional resources documents to preserve it.	3.03	0.69	*
29	I use ICT in photocopying digital instructional resources documents to preserve it.	3.21	0.69	*
30	I use ICT-based security gadgets to provide adequate security in the agricultural Education	3.00	0.67	*

X = Mean, SD = Standard Deviation, \* = Agree, Aggregate mean score = 3.31



Table 2 presents data on the opinion of respondents on the use of ICT in the conservation and preservation of instructional material resources and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria. Respondents agreed to all the items with mean scores ranged from 3.03 - 3.43. The aggregate mean score of 3.31 was obtained which was higher than the cutoff point of 2.50. Therefore, respondents agreed upon the use of ICT in the conservation and preservation of instructional materials resources and agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria. Data on standard deviation revealed that all the ten items have values ranged from 0.62 – 0.69, indicating that there was less variability in the opinions of the respondents

#### Hypothesis one

The use of ICT for instruction delivery does not significantly relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State, Nigeria.

The independent variable in this hypothesis is use of ICT in instruction delivery, while the dependent variable is agricultural education lecturers' job performance. Pearson Product Moment Correlation statistic was used to test this hypothesis. The result of the analysis is presented in Table 4.

Table 4: Pearson Product Moment Correlation Analysis of the relationship between use of ICT in instruction delivery and agricultural education lecturers' job performance (N=100)

Variable	X	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r-cal
Utilization of ICT for instruction delivery	18.78	7297		10662993		3322026	2.80
Agricultural education lecturers' job performance	33.22		2290		1048820		

$$P = 0.05; df = 98; t\text{-tab.} = 1.960$$

The result of the analysis as presented in Table 4 revealed that the calculated r-value 2.80 was higher than the critical r-value of 1.960 at 0.05 level of significance with 98 degree of freedom. With this result the null hypothesis was rejected. This result implied that use of ICT in in instruction delivery had a significant positive relationship with agricultural education lecturers' job performance. The positive r-value implied that

the higher the use of ICT in instruction delivery, the higher the agricultural education lecturers' job performance tended to be. On the other hand the lower use of ICT in instruction delivery, the lower the agricultural education lecturer' job performance tended to be.

#### Hypothesis two

The use of ICT for acquisition of instructional materials does not significantly relate to agricultural education lecturers' job performance in tertiary institutions in Akwa Ibom State

The independent variable in this hypothesis is the use of ICT for acquisition of instructional materials, while the dependent variable is agricultural education lecturers' job performance. Pearson Product Moment Correlation Analysis was used to test this hypothesis. The result of the analysis is presented in Table 5.

TABLE 5: Pearson Product Moment Correlation Analysis of the relationship between the use of ICT for acquisition of instructional materials and agricultural education lecturers' job performance (N=100)

Variable	X	$\Sigma X$	$\Sigma Y$	$\Sigma X^2$	$\Sigma Y^2$	$\Sigma XY$	r-cal
Utilization of ICT for acquisition of instructional materials	18.38	7466		11162042		34192428	2.13
Agricultural education lecturers' job performance	33.22		2290		1048820		

$$P = 0.05; df = 98; t\text{-tab.} = 1.960$$

The result of the analysis as presented in Table 5 revealed that the calculated r-value of 2.13 was higher than the critical r-value of 1.960 at 0.05 level of significance with 98 degree of freedom. With this result, the null hypothesis was rejected. This result indicated that, the use of ICT for acquisition of instructional materials had significant positive relationship with agricultural education lecturers' job performance. The positive r-value implied that the more positive the use of ICT in acquisition of instructional materials, the higher the agricultural education lecturers' job performance tended to be. On the other hand the lower the use of ICT in acquisition of instructional materials the lower agricultural education lecturers' job performance.

### Hypothesis three

There is no significant relationship between use of ICT for conservation and preservation of instructional material resources and agricultural education lecturers' job performance

The independent variable in this hypothesis is use ICT for conservation and preservation of instructional material resources while the dependent variable is agricultural education lecturers' job performance. Pearson Product Moment Correlation Analysis was used to test this hypothesis. The result of the analysis is presented in Table 6.

Table 6: Pearson Product Moment Correlation Analysis of the relationship between use of ICT for conservation and preservation of instructional material resources and agricultural education lecturers' job performance (N= 100)

Variable	X	$\Sigma X$	$\Sigma Y$	$\Sigma X^2$	$\Sigma Y^2$	$\Sigma XY$	r-cal
Utilization of ICT for conservation and preservation	17.68	8356		7788680		31808581	
Agricultural education lecturers' job performance	33.22		2290		1048820		2.12

$$P = 0.05; df = 98; t\text{-tab.} = 1.960$$

The result of the analysis as presented in Table 6 revealed that the calculated r-value of 2.12 was higher than the critical r-value of 1.680 at 0.05 level of significance with 26 degree of freedom. With this result, the null hypothesis was rejected. This implied that, the use of ICT for conservation and preservation of instructional material resources has a significant positive relationship with agricultural education lecturers' job performance. The positive r-value implied that the higher the use of ICT for conservation and preservation of instructional material resources, the higher the agricultural education lecturers' job performance tended to be. On the other hand the lower the use of ICT for preservation of instructional materials resources, the lower the agricultural education lecturers' job performance.

## 8. Discussion of findings

### 8.1 The use of ICT for instruction delivery and agricultural education lecturers' job performance

The findings in this aspect of the study showed that there was significant positive relationship between the use of ICT for instruction delivery and agricultural education lecturers' job performance. This finding was in agreement with that of Omoniwa (2005) whose study was set out specifically to determine the state and the feature of ICT utilization in teaching and learning in Nigerian schools. His findings which collaborated that of this study revealed that schools in Nigeria have an edge in the application of ICT to routine instructional delivery practices. The study also revealed a high level of ICT awareness and application in job performance among teachers in the country.

The findings of this study also agreed with Igun (2006) which revealed that all the respondents (lecturers) have access to at least an ICT gadget in their offices which is used frequently in their routine lectureship duties. It was also confirmed that ICT contributed significantly to the ease of work done by the lecturers. It is fast, reliable and does not have restrictions on content or format. The finding is also in agreement with Agbulu & Ademu (2010) whose related investigation shows many lecturers in educational institutions in Nigeria constantly use the internet, a prominent ICT tool since it facilitates online access to the world of information and aids in information exchange. The implication of this is that ICT encourages globalization and speed thereby guaranteeing lecturers immediate supply of needed information in an electronic form from any participating automated academic setting.

## 8.2 Uses of ICT for acquisition of instructional material resources and agricultural education lecturers' job performance

The result of this facet of the study revealed that there was significant positive relationship between uses of ICT for acquisition of instructional material resources and agricultural education lecturers' job performance. The finding of this facet of the study was in line with Obinyan (2010) who in his study agree that ICT acquisition and application in academic institutions have the potential to offer innumerable benefits. Alabi (2005) advised that acquisition of instructional material resources in Nigerian university should be rationalized to ensure its optimum utilization among patrons. Taadsad (2012) stressed that the goal of automation is to free lecturers from the routines of clerical work, while paying attention to students. Ajayi (2002) asserted that the automation in academic institutions was a means of up-dating their instructional resources collections and that most instructional resources vendors now operate online as they e-mail the list of available materials online to be assessed by acquisition lecturers and lecturers concerned who assesses such stock and gives approval as to needs before supplies are made.

The findings of this study also agreed with Rahman (2002) who showed that tertiary institutions that used to be considered only as the storehouse of knowledge have got a new outlook in the modern ICT era. He found out that the stock acquisition activities that were carried out manually with so much stress and strains are now being carried out smoothly with the help of ICT with greater effectiveness. He maintained that ICT is both an engine that can be used in many ways as an acquisition implement in

the hands of the lecturers and acquisition personnel. As a tool, it enhances and improves effectiveness and efficiency of lecturers' job performance.

### 8.3 Uses of ICT for conservation and preservation of instruction material resources and agricultural education lecturers' job performance

The finding in this facet of the study indicated that there was a significant positive relationship between uses of ICT in conservation and preservation of instruction material resources and agricultural education lecturers' job performance. The finding of this aspect of the study is in agreement with the view of Ray and Day (2008) that the quality of online digital instructional material resource is increasing ten-fold each year in a relatively uncontrolled open environment. Thus, not only must this be preserved but also the means to access and view them must be preserved alongside it to ensure the usability, longevity and accessibility of recorded knowledge.

Olatokun (2001) in a related study on the various techniques used in the preservation of instructional materials in selected universities in Nigeria found out that conventional conservation and preservation techniques adopted in university such as cleaning and dusting of instructional materials were not effective. Such techniques cannot contend the incidences of deterioration which often results in instructional resources becoming torn, cracked and scratched. He suggested that conservation and preservation should be ICT based where instructional material resources can be preserved with magnetic disc and optical disc. He pointed out that the microforms offers impressive packaging densities for conservation and preservation of information in this regard. Ajibola (2000) confirmed that microforms offer impressive packaging densities in instructional material. In support of the findings of this study, Ajibola and Tiamiyu (2002) also maintained that the 21st Century convergence of computers and telecommunications made global instructional material resources storage, conservation, preservation and retrieval possible.

## 9. Conclusion

ICT utilization had significant relationship with agricultural education lecturers' job performance with respect to its usage in teaching and learning, acquisition of instructional material resources and the conservation and preservation of instructional material resources. It provides agricultural education lecturers significant benefits in effective job delivery, cost reduction, productivity improvement and better services. Starting from the productivity software to specialized educational software, there are numerous examples of various applications of the ICT tools in the teaching of agricultural education. Therefore, preparation of lecturers of agricultural education to face the challenges of an ICT enriched teaching and learning environment is crucial. First teachers need to be equipped with the fundamentals of ICT tools and sufficient understanding on the integration of these tools in teaching and learning and secondly efforts must be oriented towards changing mind set and developing positive attitudes towards ICT application in teaching and learning. This requires understanding the changing role of lecturers of agricultural education from instructor to facilitators

## 10. Recommendations

Based on the findings of this study, the following recommendations were made:

1. The management of tertiary institutions in Akwa Ibom State should encourage lecturers of agricultural education to use ICT in instructional delivery to optimize their job performance.
2. Agricultural education lecturers working in tertiary institutions in Akwa Ibom State should be trained on the utilization of ICT in the acquisitions of information resources
3. Tertiary institutions in Akwa Ibom State should be adequately funded to cater for ICT facilities and devices to enable lecturers adopt digital conservation and preservation of instructional material

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