ASSESSMENT OF ONLINE RESOURCES USAGE BY AGRICULTURAL SCIENCE LECTURERS OF TERTIARY INSTITUTIONS IN BENUE STATE, NIGERIA

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Abstract

The rapid growth of online resources (also called, digital resources, internet resources, electronic information sources or e-library resources) provide new opportunities for teaching and learning practices in higher education, the world over. This study assessed online resources usage by agricultural science lecturers of tertiary institutions in Benue state, Nigeria. Data were collected from 193 lecturers randomly selected from six tertiary institutions and analyzed using percentages, mean scores, regression analysis and analysis of variance (ANOVA). The study revealed the types of online resources frequently used by respondents included electronic journals, electronic books, search engines abstracts, video/picture or graphic files and encyclopedia. Socio-economic and institutional factors that significantly influenced the use of online resources included age (t= -2.287; p = 0.05) and number of years spent on formal education (t =2.022; P =0.05). The post-hoc comparison using Tukey HSD test shows that there is a significant difference in the level of online resources usage among staff of different tertiary institutions as the mean score for University (M = 1.77, SD = 0.69) was significantly different from that of College of Agriculture (M = 0.79, SD = 0.64) and College of Education (M = 1.11, SD = 0.59). However, the mean score of College of Agriculture did not differ significantly from College of Education. Major constraints experienced by the lecturers in the use of online resources include high cost of access to online resources, non - subscription for relevant online resources by institutions and connectivity problems. This study points to the need for institutional subscription to such online resources as AGORA, OARE and HINARI by management of these institutions to enhance academic teaching and learning in Nigerian tertiary institutions.

Key words: Internet, online resources usage, lecturers, tertiary institutions

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INTRODUCTION

Background information

Online resources, also variously called, digital resources, internet resources, network resources, computer resources, online services, online facilities, electronic information sources or e-library resources (Issa, Amusan and Daura, 2009); Okiki and Asiru, 2011), are those resources that are found on computer networks of organizations (intranets) or on the global network of millions of computers (Internet). The terms 'digital resources', 'internet resources', 'network resources', 'computer resources', 'online services', 'online facilities', 'electronic information

sources' or 'e-library resources', among others, are therefore being used synonymously in the present study to describe information accessed online or through local networked resources (Harle, 2009). The word 'online' is an adjective, which refers to being connected through a computer. The effective utilization, or otherwise, of online resources may be a factor of how well information communication technologies (ICTs) are being used. Internet usage, especially, directly impacts the use of online resources. This implies that the more the number of internet users found in a given country, the greater the indication that more online resources are being used.

According to the Internet World Stats (2011), the estimated number of internet users world-wide, as at June 2010, was one billion, nine hundred and sixty-six million, five hundred and fourteen thousand, eight hundred and sixteen (1,966,514,816) people, out of the total estimated world population of six billion, eight hundred and forty five million, six hundred and nine thousand, nine hundred and sixty (6,845,609,960) people. The leading countries in internet usage, according to the report include: China, the United States of America (USA), Japan, India, Brazil, Germany, Russia, the United Kingdom (UK), France and Nigeria. The report stated that Africa with fourteen percent (14.8%) of the world's population, representing one billion, thirteen million, seven hundred and seventy nine thousand, fifty (1,013,779,050) people, have one hundred and ten million, nine hundred and thirty one, seven hundred (110, 931,700) internet users, which is equal to five percent (5.6%) of global internet users.

Nations, all over the world, are competing with one another concerning the most profitable ways of utilizing information for their national development. According to the World Bank (2002), knowledge is a critical determinant of competitiveness in the world economy and with the information revolution and increasing demands for a highly skilled workforce; nations must accord high priority to building the capacity to effectively utilize technology in education. The Bank emphasizes the critical importance of effectively utilizing new information and communication technologies (ICTs) to meet the growing need for a more sophisticated labor force, better management of information systems, and more effective contribution to poverty reduction around the world.

While the developed nations, on one hand, are doing all they can to maintain their leadership position in constructive information usage, the developing nations, on the other hand, are trying all they can to bridge the prevailing digital divide (Halavatau, 2003). Online information constitutes one of the major global sources of information being tapped by nations and individuals. ICTs are the vehicles that are being used to harness online resources and they have so changed the world that, the world as it is now, could aptly be described as a 'global village' (Ajayi, 2008). The internet is the main driver of the information age and the knowledge society that is now the norm in advanced countries. The appropriate and effective use of the internet in the generation and communication of information has greatly speeded up the general development in advanced countries.

It is evident that despite the usefulness of online resources, some common problems still exist concerning how such resources are used by lecturers, in particular, and others in the academia, in general. In Nigeria, for example, many lecturers in the higher institutions of learning still depend solely on the use of the traditional methods to impart knowledge to their students. This lack of use of ICTs to impart knowledge to students by teachers is discovered to be due to the teachers themselves being illiterates, insofar as the use of the ICT is concerned (Ajayi, 2008).

Problem statement

There is low level of internet usage for teaching, research and learning in Nigerian higher institutions of learning (Jagboro, 2003). In a study about Internet usage among university lecturers in Southern Nigeria, agricultural science teachers were discovered to be inexperienced in the use of the internet (Aduwa-Ogiegbaen and Uwameiye, 2009). Similarly, Agbulu and Ademu (2010) discovered that Agricultural Science teachers were not knowledgeable in the use of ICT for teaching. This implies that such teachers were not in a position to effectively use computer technology to access and use online resources. Akinnagbe and Baiyeri (2011) in a study on training needs analysis of lecturers for information and communication technology (ICT) skills enhancement in Agriculture, recommended that academic staff be exposed to ICT training to enhance teaching and research.

Despite the fact that lecturers do not use ICTs and the internet as they ought to, it is nonetheless true that there are huge resources available on the Internet that could be useful for learning, teaching and research. Since it is very difficult, if not impossible, for tertiary institutions of learning in Benue State to adequately meet the needs of their academic staff and students, in terms of providing them with all the appropriate and required books, journals, and other learning resources, it is imperative for the tertiary institutions, lecturers and students to find ways of accessing online resources that are useful to their academic work.

Rosenberg (2005) observed that in realization of the importance of online resources, especially to poor-resourced countries, the United Nations created some access programs in various sectors, including the free online biomedical information databases such as the World Health Organization (WHO) Health InterNetwork Access to Research Initiative (HINARI); Access to Global Online Research in Agriculture (AGORA) and the Online Access to Research in the Environment (OARE) in the environmental sector, as well as the Program for Enhancement of Research Information (PERii). According to her, the creation of these online resources have helped in reducing the cost incurred by publishers through regular printing, storage, and shipping of hard copies of their publications. This has, in turn, made it possible for such publishers to offer substantial discounts to institutions of learning of developing countries, which direly need their publications but do not have the required financial resources to buy them on regular basis. The challenges of ever-increasing journal subscription costs and declining library collections budgets have made Open Educational Resources (OER) very attractive to tertiary educational institutions all over the world. Lecturers of tertiary institutions need information for a variety of reasons; especially for their academic activities. Unfortunately, there are challenges that constitute impediments as to how effectively these tremendous resources are exploited for the benefit of users.

Based on the above scenario, the pertinent questions for this study are: what are the factors that determine the use of online resources by lecturers of agricultural science of tertiary institutions in Benue state, Nigeria? What are the online resources available to respondents? what is the frequency of use of online resources by these lecturers? what is the perception of respondents concerning the usefulness of online resources? What are the institutional and socio-economic factors that influence the use of online resources? and what are the major constraints associated with access and use of online resources?

Purpose of the study

The overall purpose of the study was to assess online resources usage by lecturers of the agricultural science in tertiary institutions in Benue state, Nigeria. Specifically, the objectives of the study included to:

(a) identify the different types of online resources that are available and are being used by lecturers of agricultural sciences in tertiary institutions in Benue state;
(b) ascertain the frequency of use of online resources;
(c) determine the perceived usefulness of online resources to the respondents;
(d) determine the socio-economic and institutional factors that influence the use of online resources; and
(e) identify the major constraints associated with access and use of online resources.

Hypotheses of the study

The following null hypotheses were formulated for the study:

(i) Differences in the frequency of use of online resources in tertiary institutions in Benue state are not significant.
(ii) Differences in the perceived usefulness of online resources among the tertiary institutions in Benue State are not significant.

Significance of the study

The study of the factors that determine online resources usage by agricultural science lecturers of tertiary institutions in Benue state, Nigeria is significant because the knowledge generated from this study shall enable lecturers, students, and agricultural workers to better understand those factors that have changed the way agricultural science professionals access and use information. The difficult tasks of accessing research information, agricultural records, agricultural product information, continuing education resources, online supply catalogs and reference information, which are now increasingly dependent on the internet, it is hoped, will be better understood and optimally utilized, as a result of the findings of the present study.

It is also hoped that the findings of the study shall propel management of higher institutions in Benue State, in particular, and Nigeria, in general, to formulate concrete and systematic policies as well as take practical steps that will enhance the training of lecturers to effectively access and use the internet and online resources to enhance their academic work for the benefit of their students and the society as a whole. The educational, agricultural, economic and other essential sectors of the Nigerian economy shall, with time, be positively affected,

if an ICT literate teaching workforce leads the nation into the present-day global knowledge society, as a result of this type of empirical study.

REVIEW OF RELATED LITERATURE

The concept of online resources and their uses

Online resources, variously called digital resources, network resources, computer resources, online services, online facilities, internet resources, electronic information sources, open educational resources; or e-library resources [Organization for Economic Cooperation and Development (OECD), 2007; Issa, Amusan and Umma, 2009; Abreh, 2010; and Okiki and Asiru, 2011], are those resources that are found on computer networks of organizations (intranets) or global network of millions of computers (Internet). Most academic online resources used worldwide are institution-based repositories, with many being open accessed, in nature. According to Abreh (2010), Open Educational Resources (OERs) are online digital resources which have been tested and have passed the basic standards of acceptance in the Creative Commons (the statutory declaration measure to assure public safety in the use of online academic/educational resources). OER may also be defined to include lecture materials, references and readings, simulations, experiments and demonstrations, as well as syllabi, curricula and teacher's guides (Wiley, 2006).

The Cape Town Open Education Declaration in its vision to promote open education states that "Educators worldwide are developing a vast pool of educational resources on the Internet, open and free for all to use. These educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge…" To realize this vision, three strategies have been proposed in order to increase the reach and impact of open educational resources. These are to: encourage educators and learners to actively participate in the emerging open education movement; open educational resources should be freely shared through open licenses, which facilitate use, revision, translation, improvement and sharing by anyone. MacNeill, Kraan and Yuan (2008), opined that governments, school boards, colleges and universities should make open education a high priority.

Many higher educational institutions around the world, in line with The Cape Town Open Education Declaration, use the Internet and other digital technologies to develop and distribute teaching and learning resources. The popularity of OER is due to their potential and promise to obliterate many educational boundaries and to promote learning. The rapid growth of OER provides new opportunities for teaching and learning practices in higher education the world over (MacNeill, Kraan and Yuan , 2008). According to OECD (2007), the "resources" comprise three areas, including: learning content, which may involve full courses, courseware, content modules, learning objects, collections and journals; tools - which may include Software to support the development, use, reuse and delivery of learning content, including searching and organization of content, content and learning management systems, content development tools, and online learning communities, as well as implementation resources: which may include Intellectual property licenses to promote open publishing of materials, design principles of best practice and localized content (OECD, 2007). A few noteworthy examples of OER include: Large institution-based OER initiatives, which examples include: MIT OpenCourseWare, OpenLearn, The Sofia (Sharing of Free Intellectual Assets initiative, Open.Michigan and Open Yale Courses; Community (or consortium) – based OER initiatives, with examples such as: Rice University's Connexions project, The China Open Resources for Education (CORE) consortium , IREL-Open , Japan Opencourseware Consortium , Multimedia Educational Resources for Learning and Online Teaching , Monterey Institute for Technology and Education National Repository of Online Courses , ParisTech OCW , OpenCourseWare Consortium and World Lecture Hall; Specialized OER initiatives, with examples such as: The Brown University's Computer Graphics Research Group , Harvard's Open Collections Program and The Johns Hopkins Bloomberg School of Public Health's OpenCourseWare project ; Public OER initiatives. Examples here include, among others: Comprehensive Knowledge Archive Network , The Encyclopedia of Life , OER Commons and Wikiversity; OER tools and services include examples such as: AEShareNet , ccLearn , Creative commons, The Centre for Open and Sustainable Learning at Utah State University , Eduforge , EduTools , Google OCW ; iTunes U , Learning Object Authoring Zone and dScribe .

Researchers who are aware of the existence and usefulness of online resources know that it is possible to stay anywhere and access digital contents of distant libraries and databases using computers and the internet

(Agboola, 2003). The whole concept of online resources usage is, therefore, derived from the awareness of users of the availability of the resources in the first place. Studies have been conducted concerning the awareness or otherwise of online resources. Thanuskodi (2010), in a study of use of the internet and electronic resources for agricultural science information, at Coimbatore University, India, asserts that while the majority of students were aware of the e-resources on the internet, they lacked the techniques of accessing such information in order to use it; a few students were totally unaware of the existence and possible usage of such resources.

These findings are in consonance with those of Parameshwar and Patil (2009), who, earlier on in their study at Gulbarga University, India, obtained a similar result. Nwezeh (2010) found, while studying the use of ICT in Nigerian universities, using the Obafemi Awolowo University as the case study, that the awareness of the existence of internet services at the university library was universal to both staff and students. Respondents, in the study, universally agreed that they made use of the internet. In another work that studied the perception and usage of e-resources and the internet by Indian academics, Kumar and Kumar (2010) found that the students and faculty, who participated in the survey, were aware of the availability of e-resources as well as the internet. Some studies have found that the social and economic background of digital library users, poor awareness of library coverage, as well as poor relevance to users' needs deterred such users from digital library usage (Adams and Blandford, 2002; Bishop, 1999; Crabtree, Twindale, O'Brien and Nichols, 1997).

Rationale for using online resources

Researchers, teachers, farmers and other groups of people and professionals have their own reasons and rationale for their use of online resources. Generally, people may use online resources for some of the reasons outlined below. In his study of the use of internet resources to improve education delivery in Bangladesh, Hatakka (2008), stated that the use and reuse of learning materials (open content) from the internet save time and cost of content development and quality improvement of the learning content. The use of open content materials from the internet, according to Hatakka, also allows teachers to have access to up-to-date teaching materials.

The Internet provides up-to-date information on a variety of classroom-related topics that are not available through other sources; that the content of textbooks, libraries, and teacher knowledge is usually enhanced by the use of materials from the internet. On its part, College-University-Directory.com (nd) listed the advantages of using the internet as being: flexible and varied in mode and appearance; ease and low cost of access for learners worldwide; ease of putting student information online and ease of updating course information. Jagboro (2003) discovered that the Internet was utilized by postgraduate students as a source of materials for academic research at the Obafemi Awolowo University and went further to reveal that there are huge academic resources available on the Internet, which could be used for learning, teaching and research. He stressed that academic libraries in Nigeria could provide guaranteed access to the Internet as a way of enhancing their books and journals collections.

Shalimov (1999) in his study of internet resources on American and Russian education indicated that the Internet and other telecommunication systems have opened a new era in academic research, due to their fast access to a variety of digital data which, in some cases, has becomes an alternative to traditional printed (paper-based) sources. According to him, some materials and tools are available in digital format only, for example, databases, electronic journals, web-sites, teleconferences, "search" functions, and so on. That as a result, research has become less costly, less dependent on the physical location of the researcher and his/her material environment and with the whole research process becoming somehow virtualized. In a study of the use of electronic resources among undergraduate and graduate students, September (2001) opined that the perceived benefits of using electronic resources to include: information being available twenty-four hours a day, the ability to work from any location, the information being available all in one place, the diversity of resources provided, and the availability of resources that one would not have access to otherwise.

According to Ungern-Sternberg and Lindquist (1995) the use of online resources is essential because:

1. Some documents are more useful in an electronic form due to enhanced searchability and manipulateability.
2. Electronic form is sometimes the only alternative, so it represents a net increase in the information base.
3. The volume of printed materials is continuously increasing at great rates and the library can only afford to acquire part of it. The great volume of printed materials also makes it advantageous to use electronic tools to locate such material.
4. The increase in cost for keeping printed materials makes electronic forms more attractive from an economic viewpoint.

Online resources are useful in different academic fields and especially in education. According to Yusuf and Onasanya (2004), online resources create a way of more quickly and easily accessing more extensive and current information as well as providing researchers with a steady avenue for the dissemination of research reports and findings. Culp, Honey and Mandinach (2003) stressed that ICT could be used as a tool for addressing challenges in teaching and learning; a change agent, and as a central force in economic competitiveness. In their analysis of ICT as a tool for economic development in the 21st century, Oladipo and Olorunfemi (2008), stated that the roles of ICT in the education sector include their being: a gateway to vast sources of information for staff and students in academia; a tool for increased productivity and personal effectiveness; a promoter of conducive teaching and learning environments and a tool for improving education outreach and standards.

A study of the use of electronic resources by research scholars of Kurukshetra University in India, Madhusudhan (2010) found that electronic resources have indeed become an integral part of the information needs of research scholars and that the e-resources can be good substitutes and supplements for conventional resources. Open Learning Centre (2007) discovered that e-learning produced higher retention of content in individuals through personalized learning. The work also indicated that the internet allows individuals to access up-to-date information, thus enabling both teachers and students to access the information they need, in order to teach and learn at their own individual rates, as well as collaborate with other teachers, scientists, researchers, students and other interested individuals. According to Uzoegwu and Iloanusi (2010), distance education, such as practiced at the National Open University of Nigeria (NOUN), has made major changes in how educators and students think about teaching and learning and in the process providing educational opportunities to segments of the population that could not be reached before by allowing students to learn in more convenient times to them. In distance education, people extend the period of their education from a few years of schooling to a lifelong learning process.

Distance education requires the use of methods of instruction that uses different communication technologies in teaching learners in different places. In Open University program, students receive instruction entirely at a distance. This method of education is valuable in developing countries because large number of students can be reached with few teachers. It also provides a cost-effective way of using limited academic resources. According to Kwache (2005), in Nigeria, if open and distance education is well supported by e-learning technology, it will provide accessibility, flexibility and collaborative work to both the urban and rural populace of Nigeria and Africa in general who might not have the privilege to attend conventional universities.

Socio-economic and institutional factors that influence the use of online resources

According to Tondeur, Valcke & van Braak (2008) both the teacher and school characteristics such as the schools' openness to change and the availability of an ICT school policy plan, are positively related to the use of computers as a learning tool and to the adoption of ICT in view of basic computer skills. The British government in a study discovered that most schools and many colleges had no clear strategy for selecting, organizing, managing and distributing the very wide range of resources available for learning and teaching. The study indicated that online learning and teaching opportunities in many schools was influenced by the importance placed on these opportunities by the head teachers and other promoted staff as well as the individual enthusiasm of class teachers. Too few schools took maximum benefit from the resources of the LT Scotland website.

Some of the factors that were discovered to have combined to determine the level and quality of use of ICT in learning and teaching included policy and planning, clear identification of key players and their roles and responsibilities in taking forward the agenda set by policies and plans, improved ICT infrastructure and resources to support learning and teaching , management of learners and digital content, confidence and competence of teaching staff in the use of ICT as well as the level and quality of technical support is very important in maintaining the confidence of learners and teaching staff in the reliability of access to equipment and software (*www.hmie.gov.uk/documents/publication/iseictilat.pdf).*

Tenopir (2003) found that factors such as subject discipline, status, sex and age are some of the important factors that influence the use of electronic resources and digital libraries. He went further to explain that the scholar's discipline appears to be one of the most important of all the factors that influence the use of electronic library use. He also showed that the use of electronic journals varied with the purpose of use such as research and teaching.

According to Borgman (2000) in Torma and Vakkari (2004), online resources appear to be most available in sciences and medicine and least available in social sciences and humanities. Sometimes it is not just the characteristics of a discipline, but also the availability of electronic resources in the discipline that explains the use

of such electronic resources in such a discipline. A more equitable availability of electronic resources in all fields has the possibility of reducing the significant disparity in the availability and use of electronic resources across various disciplines.

Studies indicate that the majority of internet users and hence online resources users, are young adults within the age bracket of between 13 to 30 years (Anunobi and Mbagwu, 2009; The Australian Bureau of Statistics, 2001-2005/2006; Amaeshi, Anyanwu and Oparaku, 2006). In the studies cited, the percentages of younger and older people that used the internet were significantly lower than that of the young adults. The general summary of the study of the use of the internet in Imo state shows that: a significantly greater number of children and young male adults used the internet more than their female counterparts; more middle aged females used the internet more than their male counterparts; the difference in the percentage of male and female internet users was not significant; a significant majority of internet users were unmarried and possessed the senior secondary school certificate as their highest educational qualification.

Most respondents with higher educational qualifications were however married; most internet users preferred regular visits to cybercafés and longer browsing hours; reasons for using the internet included academic and research purposes, among other reasons. Earlier studies showed that most internet users were male who were fairly young, university students, technical, professional or researchers, with most of them possessing higher educational qualifications, which possibly motivated them to use the internet (Miller, 1996 and Larson, 1996).

With reference to the number of visit to the cybercafé and the length of time spent surfing the internet, it was discovered that respondents' priorities sometimes determined their use of time for browsing. In effect, younger Internet users were observed to have had more time at their disposal than those in their 30s and 40s, who were working and in their prime and so did not have much time to spare online. Those aged 50 and older had and could spare more time online (Miller, 1996). Most people in Nigerian universities indicated that they use internet on weekly and daily basis, with the rest of the respondents using it on monthly basis (Jagboro, 2003). Amaeshi, Anyanwu and Oparaku (2006) however found that most people use the internet when the need arose. Most faculties and students in academic institutions in Nigeria use the internet for school related activities such as search for materials needed for assignment, research, teaching and class work (Nwogu and Anunobi, 2007; Anunobi and Mbagwu, 2009 and Palesh, Saltzman and Koopman, *2004*).

Factors militating against online resources usage

The factors which hinder effective use of online resources may be technical and non-technical in nature. According to the Association of African University (AAU, 2000) the technical constraints include inadequate and poor telecommunication infrastructure, absence of national information communication infrastructure, problems of connectivity, lack of or limited bandwidth for ICT for learning, teaching, and research, and non-reliability of public electricity; while the non-technical constraints include, among other constraints: lack of professional development for lecturers, inadequate human resource base, inadequate determine the possession of fundamental internet and online usage skills, necessary for general surfing of the net;

funding of ICT infrastructure, inadequate maintenance of available facilities, and inadequate staff development. Other constraints may include: lack of access to online resources, as a result of lack of hardware, poor quality hardware, inappropriate software and lack of time to use ICTs as a result of school work [British Educational Communications and Technology Agency (BECTA, 2004)]. There are also technical constraints that affect the use of online resources. These, according to BECTA include lack of technical support, lack of telecommunication and unreliability of electricity.

Aduwa-Ogiegbaen and Iyamu (2005) outlined some of the problems that they perceived are facing ICT in Nigeria, as outlined below. According to them, computer hardware, software and associated peripherals such as printers, monitors, paper, modems, extra disk drives, among others, are very expensive and unaffordable by most Nigerians. The costs associated with connectivity to the internet are additional costs that those who wish to get connected to the internet must bear, be they private individuals or corporate entities. Another constraint to getting connected to the internet and online resources, identified by them, is the issue of weak infrastructure in Nigeria. Nigeria is bedeviled with unreliable and erratic power supply. A day hardly goes by without power outage, that is, on days when there is any power at all. This makes it difficult for sensitive electronic equipment such as computers to function properly, especially under the extreme weather conditions prevailing in Nigeria.

The high levels of dust during the dry season in Nigeria also make electronic equipment to have a short life span. In most rural Nigeria there is no electricity at all. Inadequate telecommunication facilities are another

major problem confronting the promotion of the use of ICT in Nigeria. The inadequacy of land telephone system has compelled most Nigerians to make do with the Global System of Mobile Communication (GSM) mode of communication, with the high charges charged by operators, despite the epileptic services they render. Yet, another constraint against the effective use of the internet, according to Okebukola (1997) is the issue of skillful manpower. He opined that people who are required to use computers in Nigeria are either inadequately trained or not trained at all.

The lack of appropriate software for use in computer programs in Nigeria is another constraint limiting the effective utilization of the internet. As a result of the foregoing, software developers and publishers from developed world try to develop software and multimedia programs that have universal application. The unequal level in development in all spheres of life, as well as differences in culture make the universal software and multimedia products unsuitable for use in a developing country like Nigeria. The problem of software production is further compounded by the high cost that is required and lack of indigenous programmers in Nigeria.

Another serious constraint against the use of the internet, according to Aduwa-Ogiegbaen and Iyamu (2005), is limited access to the internet. Aduwa-Ogiegbaen found that there are few genuine internet service providers (ISPs) that provide internet gateway services in Nigeria. The services offered by these providers are expensive and are not afforded by the majority of Nigerians. Most of the other ISPs are exploitative and fraudulent. These offer poor services, charge high fees and at the same time cheat on their bandwidths. One of the greatest technological challenges in Nigeria, therefore, is how to establish a reliable and cost effective Internet connectivity (Aduwa-Ogiegbaen and Iyamu, 2005). According to Yusuf (2005a) some of the problems of non integration of ICT in Nigerian schools include 'technical, non-technical, human and organizational and financial.

Technical obstacles identified include the poor telecommunication infrastructure, absence of national information communication infrastructure, lack of university coherent plan for ICT, problems of connectivity, lack of or limited bandwidth for ICT for learning, teaching, and research, non-reliability of public electricity supply, thus necessitating extra cost for standby generators. The non-technical deals with lack of professional development for faculty, human and organizational aspect relates to inadequate planning for ICT integration in regular activities of universities, and inadequate human resource base, while financial relates to inadequate funding of ICT infrastructure, maintenance of available facilities, and staff development'. In his view, Nwazuoke (2001) stated that access to and uses of online resources, in Nigeria, is hampered by the inadequacy of existing resources, lack of information about them, inadequate security of materials, uncooperative attitude of parent bodies, lack of appropriate and coherent policies, inflation ,and unstable budgetary allocation (Nwazuoke, 2001).

National policies and institutions enhancing online resources usage

According to Yusuf (2005), most nations of the world have evolved national information and communication technology policies, to serve as a framework for ICT integration in all facets of the society. Nigeria has also been formulating and enacting ICT policies and programs that are designed to propel the country into the global knowledge society of the present times. Some of the policies, programs and institutions in question include: National policy on computer education, National policy on telecommunication, Nigerian national policy for information technology (IT), The school net program, National information technology development agency (NITDA), National Open University of Nigeria (NOUN) and Nigeria national digital library, among others.

Conceptual framework

Online resources, of different types, are available on various intranets of higher institutions of learning, globally, as well as on the internet. The resources are employed by users, especially in the academia, for teaching, learning and research. The type and quality of the online resources, socio-economic and institutional factors, as well as government institutions all impact either negatively or positively on how users employ the resources at their disposal. The uses to which the online resources are employed are affected by some given constraints and this, in turn, influences the improvement or otherwise of teaching, learning and research.

Seven boxes A, B, C, D, E, F and G (Fig. 1) were used to explain the nexus involved in the present study.

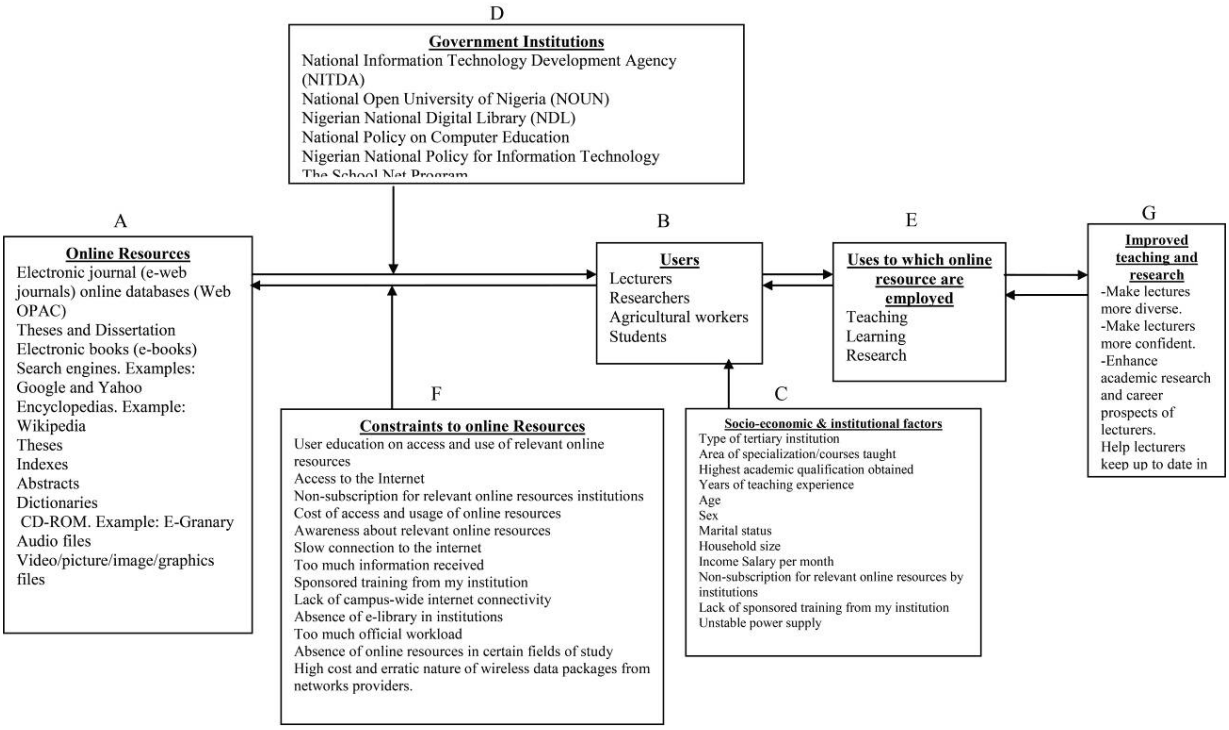

Figure 1: Schema of assessment of online resources usage by agricultural science lecturers in tertiary institutions in Benue state Nigeria.

METHODOLOGY

The study area

This study was conducted in Benue State of Nigeria. It covered tertiary institutions of learning in the state. Specifically, it targeted tertiary institutions of learning in which agricultural science is taught, made up of federal, state and private universities, colleges of agriculture and colleges of education. Benue State is located in North Central Nigeria in what is termed the 'Middle Belt' of Nigeria, between longitude 7^0 44'E and 9^0 55'E and between latitude 6^o 29'N and 8^o 7'N. The state came into existence on 3rd February, 1976. The capital city of the state is Makurdi *(http://www.informationnigeria.org/2009/04/nigeria-by-population.html).*

JAMB e-brochure (2012) indicates that the tertiary institutions of learning in Benue State include, among others, Federal University of Agriculture, Makurdi; Benue State University, Makurdi; University of Mkar, Mkar, Gboko; Akperan Orshi College of Agriculture, Yandev, Gboko; College of Education, Katsina-Ala; College of Education, Oju; FIDEI Polytechnic, Gboko; Calvin Foundation College of Education, Naka; Apa College of Education, Aidogodo; Benue State Polytechnic, Ugbokolo and the Nigerian Army School of Military Engineering, Makurdi. Agricultural science is taught in: Federal University of Agriculture, Makurdi; University of Mkar, Mkar, Gboko; Akperan Orshi College of Agriculture, Yandev, Gboko; College of Education, Katsina-Ala; College of Education , Oju and College of Education, Luga, Gboko (an affiliate of College of education, Katsina-Ala).

Population and sampling procedures

The population for the study comprised all agricultural science lecturers of the appropriate tertiary institutions in Benue State. The institutions included federal, state and privately owned tertiary institutions of learning. Thirty percent (30%) of the agricultural science lecturers, of the selected tertiary institutions were randomly sampled for the administration of the questionnaire since, according to Denga and Ali (1989) in Issa, Amusan and Daura (2009), there is no universal rule for determining the appropriateness of sample sizes, but that a sample could be about 15-30 percent of a given population.

Instrument for data collection

This study employed a survey method, in which a structured questionnaire was used to collect primary data. The instrument was divided into sections, based on the objectives of the study. Research assistants were used to collect the required data.

Measurement of variables

The first step in the measurement of the variables involved the collection of the socio-economic and institutional data of the lecturers. Respondents were requested to state: the type of tertiary educational institution where they worked. That is, whether the tertiary institution was a university, college of education or college of agriculture; the name of their institution and their ages (in years). The respondents' ages were later grouped as: 26-35 years, 36-45 years, 46-55 years and above 55 years. With respect to sex, respondents were provided with two options of male and female, where they were required to identify with one, as appropriate. Marital status of respondents was determined by respondents indicating from among the options provided. The options included: single, married, divorced, widowed or separated.

Educational attainments of the respondents were listed for them to choose from, as appropriate. This included: HND/ B.Tech./B. Agric./ B.Sc.; M. Sc/M. Phil; Ph. D/D.Sc. and they were expected to indicate the number of years spent on formal education. Each respondent was expected to indicate his/her status/rank. That is, whether he/she was a professor; associate professor/reader; senior lecturer; lecturer 1; lecturer 11; lecturer 11I; graduate assistant; principal lecturer or chief lecturer.

To identify the types of online resources used by respondents in their various tertiary institutions (objective one), respondents were expected to indicate such online resources against a table, where the resources were listed. These resources included, among others: electronic journals, Web online databases (Web OPAC), electronic books, indexes, abstracts, dictionaries, theses and dissertations, CD-ROM and search engines. Frequency count and percentages were used to analyze this objective.

In objective two, respondents were expected to indicate their level of skillfulness in computer, internet and online activities usage. A three point Likert-type scale of: very skillful (2), skillful (1) and not skillful (0), was used. The value of the Likert-type scale was then added to obtain 3, which was further divided by 3 to obtain a mean value of 1. Any response option with a mean value of equal to or greater than 1 was regarded as skillful, while any with a mean value of less than 1 was regarded as not being skillful. Mean scores and Standard deviations were used to analyze this objective.

In objective three, respondents were required to indicate how frequently they made use of the listed individual online resources, using a four-point Likert-type scale of very frequently (3), frequently (2), Seldomly (1) or not at all (0). The value of the Likert-type scale was then added to obtain 6, which was further divided by 4 to obtain a mean value of 1.5. Any online resource with a mean value of equal to or greater than 1.5 was regarded as frequently used, while any one with a mean value of less than 1.5 was regarded as not being frequently used. Mean scores and Standard deviations were used to analyze this objective.

Objective four was designed to determine the perceived usefulness of online resources to the respondents. That is, the perceptions of respondents concerning the degree to which they thought online resources had been helpful to them in their work. Options, from where respondents were expected to select (as many options as were applicable to them) were provided. A three point Likert-type scale was used in the measurement of this objective. The options provided included those that indicated which listed online resources were: very useful (3), useful (2) or least useful (1). The value of the Likert-type scale was then added to obtain 6, which was further divided by 3 to obtain a mean value of 2. Any response option, which mean value was equal to or greater than 2.0 was regarded as being useful to the respondent, while a response option with a mean value of

less than 2 was regarded as not being useful to the respondent. Mean scores and Standard deviations were used to analyze this objective.

In objective five, respondents were expected to, from the answers they provided about themselves and their institutions in section one of the questionnaire, give an indication of those personal and institutional factors that were perceived by them to have influenced their use of online resources, including their: type of tertiary institution (university, college of agriculture or college of education); educational qualification (HND/B.Tech./B.Agric./B.Sc.; M.Sc.;Ph.D); age, in years (26-35, 36-45, 46-55 and above 55); sex (male or female); marital status (married, single or widowed); household size (1-5, 6-10 and above 10 members); rank (Graduate assistant, Lecturer III, Lecturer II, Lecturer I, Senior lecturer, Principal lecturer, Associate professor/Reader, Chief lecturer or Professor); years of work experience (1-10, 11-20, 21-30 and above 30); years spent on formal education (10-20, 21-30, above 30; and income/salary per month, in Naira (10,000-100,000; 101,000-200,000; 201,000-300,000; 301,000-400,000; 401,000-500,000 and above 500,000). Multiple regression was used to analyze this objective, using the following equation and stating the variables that influenced online resources usage, thus:

$Y= b_1x_1+ b_2x_2+ b_3x_3+ b_4x_4+ b_5x_5+ b_6x_6+ b_7x_7+ b_8x_8+ b_9x_9 +$

Where:

Y= level of usage of online resources, in percentage (dependent variable)

x = vector explanatory variable

b_1 = coefficient

e = the independent distributed error term

X_1= age of lecturers (measured in years)

X_2 = marital status (single = 1; married = 2; separated = 3; divorced = 4; widowed = 5)

X_3 = household size (measured by number of persons living in the household)

X_4 = sex (male =1; female = 2)

X_5 = level of education (measured in years of formal schooling)

X_6 = monthly income (measured in Naira)

X_7 = years of experience as a lecturer (measured in years)

X_8 = type of institution (university = 1; college of agriculture = 3; college of education = 3)

X_9 = internet access within the institution (Yes =1; No = 0)

To identify the major constraints associated with the use of online resources by the respondents (objective 6), a list of perceived constraints associated with the use of online resources, reviewed from literature, was provided for the respondents to select from. Some of these included: lack of user education on access and use of relevant online resources, lack of access to the Internet, non-subscription for relevant online resources by institutions, cost of access and usage of online resources, lack of awareness of relevant online resources, lack of knowledge of use of the computer, slow connection to the internet, too much information received, lack of sponsored training from the institution, lack of a campus-wide internet connectivity, absence of an e-library in from institutions, too much official workload, absence of the online resources certain fields of study and high cost and erratic nature of wireless data packages from networks. A three point Likert-type scale of very serious (2); serious (1) or not serious (0) was be used. The value of the Likert-type scale was then added to obtain 3, which was divided by 3 to obtain a mean value of 1.0. Any response option, which mean value was equal to or greater than 1.0 was regarded as a constraint to access and use of online resources by the respondent, while a response option with a mean value of less than 1.0 was regarded as not being a constraint to access and use of online resources by the respondent.

Data analysis

The socio-economic and institutional characteristics of the respondents were analyzed using frequency percentage and mean statistic. Objective 1, which involved the identification of different types of online resources used by respondents in their various tertiary institutions, was analyzed using frequency count and percentage. Objectives 2, 3, 4 and 6, which involved ascertaining the level of skillfulness in computer, internet and online activities usage by respondents; ascertaining the frequency of use of online resources; determining the perceived usefulness of online resources and identifying the major constraints associated with access and use of online resources, were analyzed using mean statistic and standard deviation. Objective 5, which involved the determination of the socio-economic and institutional factors that influenced online resources usage by respondents, was analyzed using multiple regression. One way analysis of variance (ANOVA) was used to test both

hypotheses one and two. The Statistical Package for the Social Sciences (SPSS) version 16 constituted the software that was used to analyze the data.

RESULTS AND DISCUSSION

Institutional and socio-economic characteristics of respondents

Age

The data in Table 1, shows that a large proportion (33.7%) of the respondents were in the age bracket of 46 and 55 years, 31%, 30.6%, and 4.7% of the respondents, were in the age brackets of 36-45 years, 25-35years and above 55years of age, respectively. The mean age of the respondents was 42 years. The mean age of the respondents indicated that most of the respondents were still in their active ages and so might be in a better position to carry out the duty of imparting knowledge to the students more effectively. However, with a mean age of 42 years it could be inferred that there are relatively few young adults in the teaching profession. This seemingly low percentage of young adults in the teaching of agricultural science possibly indicates aversion of youths to science courses and desire to be involved in more lucrative jobs than teaching, as well as the long period it takes to train to become a teacher and the rigorous training and other requirements involved, once a person becomes one. There is therefore the need to entice youths into the teaching profession, by offering incentives to make the teaching job compare favorably with oil, gas and telecommunications jobs, among others. The result of the study is in consonance with Tenopir (2003), who also found that age influences the use of electronic resources and digital libraries. Okiki and Asiru (2011) in their work on the use of electronic information sources by postgraduate students in Nigeria reported that age negatively correlates with use of online resources.

Sex

Data in Table 1 show that majority (82.4%) of the respondents were male, while 17.6% were female. The result suggests that there may be more men in the system than women, apart from empirical evidence that women find it more difficult to find information online and therefore much less likely to use online resources (Bassi and Camble, 2011).

Marital status

Table 2 reveals that the majority (80.3%) of respondents were married, while 16.1% and 3.6% were single and widowed, respectively. These findings suggest a positive relationship between age and marital status. This indicates that at the average age of 42 years, most people should, ideally, be married and settled. It is also possible that married people, in most cases, tend to be spared the unnecessary distractions that attend the lives of most single persons. This helps them to more fully concentrate on their jobs.

Household size

Table 2 shows that majority (52.9%) of the respondents had a household size of between 6 to 10 members. About 46% and 1% of the respondents had household sizes of between 1-5 and more than 10 members, respectively. The mean household size was 6 persons. This suggests that the respondents have a considerably large household size.

Academic attainment

Table 1 shows that a large proportion (48.7%) of respondents possessed first degree or its equivalent, 25.9% of respondents possessed masters' degree or its equivalent, 16.1% had M.Phil while the remaining 9.3% had Ph. D degree. This indicates that, in terms of academic attainment, respondents were relatively young, with great potential for productivity and growth on the job.

Rank

Data in Table 1 show that 19.7% of the respondents had attained the rank of lecturer II, while lecturer I, Principal lecturers, senior lecturers, lecturer III, and graduate assistants; constituted 16.6%, 16.1%, 13.5%, 11.9%, and 10.4% of the respondents respectively. About 6% of the respondents were chief lecturers, while associate professors/readers and professors made up the remaining 4.7% and 1%, respectively. There appears to be a positive correlation between academic attainment and rank. The implication for the teaching profession here is that there is room for growth and development.

Table 1: Distribution of respondents' socio-economic characteristics (in percent)

Socio-economic characteristics	Frequency(n=193)	%	M
Age			
25-35	59	30.6	
36-45	60	31.0	42
46-55	65	33.7	
>55	9	4.7	
Sex			
Male	159	82.4	
Female	34	17.6	
Marital status			
Married	155	80.3	
Single	31	16.1	
Widowed	7	36.0	
Household size			
1-5	89	46.1	
6-10	102	52.9	6
>10	2	1.0	
Academic attainment			
HND/B.Tech./B.Agric./B.Sc	94	48.7	
M.Sc	50	25.9	
M.Phil	31	16.1	
Ph.D	18	9.3	
Rank			
Graduate assistant	20	10.4	
Lecturer 111	23	11.9	
Lecturer 11	38	19.7	
Lecturer 1	32	16.6	
Senior lecturer	26	13.5	
Principal lecturer	31	16.1	
Associate professor/Reader	9	4.7	
Chief lecturer	12	6.2	
Professor	2	1.0	
Years of work experience			
1-10	115	59.59	
11-20	50	25.90	
21-30	24	12.44	10.3
>30	4	2.07	
Years spent on formal education			
10-20	121	88.6	
21-30	67	34.7	20
31-30	5	2.6	
Income (Salary)/Month			
1000-100,000.00	31	16.06	
101,000-200,000.00	93	48.19	
201,000-300,000.00	48	24.87	N181,413.37
301,000-400,000.00	10	5.18	
401,000-500,000.00	7	3.63	
>500,000.00	4	2.07	

Source: Field survey, July 2012

Years of work experience

The majority (62.0%) of the respondents, in Table 1, had between 1 and 10 years work experience; 25.7% of respondents had 11-20 years; while 11.7% of the respondents had 21-30 years. About 1% had 30 years and above of work experience. The average work experience was 10.3 years. The implication of these findings on the use of the internet and, by extension, online resources is that the respondents are possibly young and growing on the job and may be more zealous in using online resources for teaching and research in order to be promoted in their careers. These findings are in line with the findings of Aduwa-Ogiegbean and Uwameiye (2006) who discovered, while studying internet usage among university lecturers in southern Nigeria, that lecturers with less than five years of work experience used the internet more than other respondents with more experience. Possible reasons for this action may be that most of such lecturers are young and new on the job and are thus looking for ways to get information for their academic papers, which are critical to their promotions as well as using the online resources for their lectures. The predominance of less experienced workforce appears to be the hallmark of the academia, as Mulla (2011) also discovered in his study that only 10% of the faculty members had more than 25 years of experience in teaching.

Years spent on formal education

Table 1 indicates that 88.6% of the respondents spent between 10 and 20 years on formal education. Those that spent 21-30 years accounted for 34.7% of the sampled population, while 2.6% of the respondents spent 30 years or above on formal education. The average years spent on formal education by respondents was 20 years.

Income/salary per month

According to Table 1, majority (48.19%) of the respondents earned between (Nigerian Naira , NGN) ₦101,000 and ₦200,000 per month. About 24.87%, 16.06%, 5.18% and 3.63% of the respondents earned ₦201000 - ₦300,000; ₦10,000 -₦100,000; ₦301,000 - ₦400,000; and ₦401,000 - ₦500,000, respectively. Only about 2.07% of the respondents earned more than ₦500, 000 per month. The average income/salary was ₦181, 413.37. The implication here is that by virtue of the low income/salary of the majority of the lecturers, it is reasonable to infer that the workforce in the tertiary institutions is young and mostly inexperienced. This finding is also in alignment with findings in respect of work experience of respondents in the study.

Types of online resources used by respondents

Data in Table 2 show the online resources usage by respondents. About 70% of respondents used electronic journals such as African Journal online (AJOL) while 67.9% of respondents indicated that they made use of electronic books. Other online resources used by most respondents included: search engines, such as Google and Yahoo (87.0%), encyclopedia, such as Wikipedia (82.9%), theses (57.0%) indexes (51.8%), abstracts (71.5%), dictionaries (72.5%), and video/picture/image/graphic files (63.7%). The online resources that were not used by most respondents included: CD-ROM, such as E-Granary (45.6%), audio files (44.6%). Web online databases (Web OPAC), such as AGORA, OARE and HINARI (45.6%).

It can be inferred from the result of the study that respondents did not use certain online resources, including CD-ROM and Web OPAC possibly because of non purchase (as in the case of CD-ROMs) and lack of subscription by their institutions. It therefore makes it critical for institutions to subscribe/provide access to such online resources which are advantageous in the teaching and learning process.

In conformity with the findings of this study, Google was found to be the most widely used search engine for locating information electronically (Madhusudhan, 2010; Salaam and Adegbore, 2010). E-journals and e-mail were also found to have been extensively used in an earlier study by Sharma (2009), just as in the present study.

Table 2: Types of online resources used by lecturers

Online resources	Yes	Frequency	Percentage
Electronic journal, e.g. AJOL	Yes	135	69.9
Web OPAC, e.g. AGORA, OARE and HINARI	Yes	88	45.6
E-books	Yes	131	67.9
CD-ROM, e.g. E-Granary	Yes	69	35.8
Search engines, e.g. Google and Yahoo	Yes	168	87.0
Encyclopedia, e.g. Wikipedia	Yes	160	82.9
Theses	Yes	110	57.0
Indexes	Yes	100	51.8
Abstracts	Yes	138	71.5
Dictionaries	Yes	140	72.5
Audio files	Yes	86	44.6
Video/Picture/Image/Graphic files	Yes	123	63.7

Source: Field survey, July 2012

Mean scores for frequency of use of online resources by respondents

Data in Table 3 show the mean scores for frequency of use of online resources by respondents. The most frequently used online resource was found to be search engines like Google, Ask me and Yahoo (M = 2.23). This could be as a result of the importance attached to these tools for searching materials used as lecture materials and research generally. Also, it could be due to non subscription by institutions to online resources like OARE, HINARI or limited knowledge of the respondents regarding the usefulness of available online resources.

Table 3: Mean scores for frequency of use of online resources

Online resources	Mean	Std. Deviation
Electronic journal e.g. AJOL	1.49	1.10
Web online databases (Web OPAC) e.g AGORA, OARE and HINARI	1.09	1.11
Electronic books	1.31	1.1
CD-ROM e.g E-Granary	0.64	0.94
Search engine e.g. Google, and Yahoo	2.23*	1.00
Encyclopedia e.g. wikipedia	1.79	1.11
Theses	1.08	1.01
Indexes	0.91	1.50
Abstracts	1.22	1.01
Dictionaries	1.27	1.10
Audio files	0.77	0.90
Video/picture/image/graphics files e.g U-tube	1.03	0.94

Source: Field survey, July 2012. (*Frequent)

Perceived usefulness of online resources

Entries in Table 4 reveal the mean scores of perceived usefulness of online resources as indicated by the respondents. The online resources that were perceived to be useful included: search engines (M=2.67), electronic journals (M=2.54) and encyclopedia (M=2.48). Electronic books (M=2.43), web OPAC (M=2.31), dictionaries (M=2.24), theses and abstracts (M=2.1, each). The results of the study suggest that respondents generally perceived online resources to be useful in their work. The implication of this finding is that teaching and research are likely to be enhanced in an environment where there is a positive perception concerning online resources usage (Bashorun, Isah and Adisa, 2011). Ibrahim (2005) confirmed in a study on user perception of electronic resources that most respondents valued the importance of e-resources and services in teaching and research. The study is also in conformity with the findings of Ansari and Zuberi, (2010) and Omeluzor, Madukoma, Bamidele and Ogbuiyi (2012).

Table 4: Mean scores of perceived usefulness of online resources

Online resources	M	Standard deviation
Electronic journals (e-Journals). Examples: African Journals Online (AJOL)	2.54*	0.74
Web online databases (Web OPAC). Examples: AGORA, OARE and HINARI	2.31*	0.84
Electronic books (e-Books)	2.43*	0.81
CD-ROM. Example: E-Granary	1.92	0.91
Search engines. Examples: Google and Yahoo	2.67*	0.64
Encyclopedia. Example: Wikipedia	2.48*	0.80
Theses	2.21*	0.83
Indexes	1.94	0.84
Abstracts	2.21*	0.81
Dictionaries	2.24*	0.85
Audio files	1.76	0.91
Video/Picture/Image/Graphics files e.g. U-Tube.	1.94	0.91

Source: Field survey, July 2012 (* useful)

Socio-economic and institutional factors that influence the use of online resources

The result of the regression analysis as is contained in table 5 shows that two variables, age (t= -2.287; p = 0.05) and number of years spent on formal education (t =2.022; P =0.05) had significant influence on the use of online resources. The findings indicated that the use of online resources by lecturers in the study area was influenced by age and years spent on formal education. However, age had a negative relationship with the use of online resources showing that the older the respondents, the less they used online resources.

On the other hand, number of years spent on formal education had a positive relationship with the use of online resources by lecturers in the area. This indicates that the more the number of years spent on formal education, the more the likelihood of using online resources by lecturers.

Table 5: Socio-economic and institutional factors influencing the use of online resources

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	64.105	24.942		2.570	0.011
Age	-0.959	0.419	-0.263	-2.287	0.024*
Marital status	9.674	6.751	0.121	1.433	0.154
Family size	0.214	1.284	0.017	0.167	0.868
Years spent on formal education	1.226	0.606	0.168	2.022	0.045*
Income or Salary per month	0.000	0.000	0.007	0.074	0.941
Type of tertiary institution	-1.556	4.930	-0.035	-0.316	0.753
Area of specialization or courses taught	0.035	0.137	0.028	0.253	0.801
Do you have access to the internet	-2.957	13.725	-0.017	-0.215	0.830

Source: Field survey, July 2012 (* significant)

Perceived constraints against access and use of online resources

Table 6 shows factors considered to be constraints to access and use of online resources by respondents including: unstable power supply (M = 2.27), high cost of access and usage of online resources (M = 2.15), non-subscription for relevant online resources by institutions (M = 2.08), slow connection to the internet (M = 2.04), lack of sponsored training from institutions (M = 2.0), inadequate technical support (M = 1.99), lack of campus-wide internet connectivity (M= 1.92), lack of access to the internet (M =1.90), lack of user-education on access and use of relevant online resources (M = 1.87), lack of awareness of availability of relevant online resources and lack of knowledge of use of computer (M = 1.80, each), non availability of ICT training centers to update ICT knowledge (M = 1.74), lack of interest (M= 1.69), too much time required for accessing and using online resources (M = 1.62), inability to master the required computer skills (M = 1.60), too much information received from the internet (M = 1.57), distraction from children (M = 1.45), fear of handling/touching a computer and fear of being laughed at by peers (M = 1.43, each) and poor eye sight (M = 1.42).

The implications of the data shown in table 6 are that most respondents had similar constraints, as their standard deviations are not too far from the mean. Most studies concerning constraints against access and use of online resources show similar results as obtained in this present study, with some of the outstanding constraints being: incessant power supply and lack of user education (Bashorun, Isah and Adisa, 2011; Mulla, 2011; Chigbu and Dim, 2012; and Omeluzor, Madukoma, Bamidele, and Ogbuiyi 2012).

Table 6: Perceived constraints against access and use of online resources

Constraints	M	Std. Dev.
Lack of access to the Internet	1.90*	0.82
Non-Subscription for relevant online resources by my institution	2.08*	0.80
High cost of access and usage of online resources	2.15*	0.81
Lack of awareness of relevant online resources	1.80*	0.81
Lack of knowledge of use of the computer	1.80*	0.91
Slow connection to the internet	2.04*	0.81
Too much information received	1.57*	0.80
Lack of sponsored training from my institution	2.00*	0.90
Lack of a campus-wide internet connectivity	1.92*	0.90
Lack of user education on access and use of relevant online resources	1.87*	0.80
Inadequate technical support	1.99*	0.80
Lack of interest/ Poor attitude towards acquiring ICT skills	1.69*	0.82
Poor eye sight	1.42*	0.70
Distraction from children	1.45*	1.10
Too much time required for accessing and using the resources	1.62*	0.78
Fear of handling/touching a computer	1.43*	0.75
Inability to master the required computer skills	1.60*	0.82
Unstable power supply	2.27*	0.83
Fear of being laughed at by peers	1.43*	0.72
Non availability of ICT training centers to update ICT knowledge	1.74*	0.80
Unwillingness of some colleagues to teach others what they have acquired	1.57*	0.74
Lack of competence in internet searching skills	1.68*	0.81
Financial problems	1.95*	0.83

Source: Field survey, July 2012 (*constraints)

Differences in the frequency of use of online resources in the tertiary institutions in Benue State are not significant.

The result in table 7 shows that there are significant (F=41.445) differences in the frequency of use of online resources by lecturers in tertiary institutions in Benue state. The null hypothesis is therefore rejected.

Table 7: ANOVA table for frequency of use of online resources in the tertiary institutions in Benue State

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36.425	2	18.212	41.445	0.000
Within Groups	81.734	186	0.439		
Total	118.158	188			

Results of post-hoc test (Table 8) shows that there is a significant difference in the level of online resources usage among the tertiary institutions in the area. The post-hoc comparison using Tukey HSD test indicated that the mean score for University (M = 1.77, SD = 0.69) was significantly different from College of Agriculture (M = 0.79, SD = 0.64) and College of Education (M = 1.11, SD = 0.59). College of Agriculture did not differ significantly from College of Education

Table 8: Post-hoc test for ANOVA of frequency of use of online resources in the tertiary institutions in Benue State

Multiple Comparisons using Tukey HSD

(I) Type of tertiary institution	(J) Type of tertiary institution	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
University	College of Agriculture	0.97918*	0.11198	0.000	0.7146	1.2438
	College of Education	0.66134*	0.14431	0.000	0.3204	1.0023
college of Agriculture	University	-0.97918*	.11198	0.000	-1.2438	-0.7146
	College of Education	-0.31784	0.15974	0.118	-0.6953	0.0596
College of Education	University	-0.66134*	0.14431	0.000	-1.0023	-0.3204
	college of Agriculture	0.31784	0.15974	0.118	-0.0596	0.6953

* The mean difference is significant at the 0.05 level.

Differences in the perceived usefulness of online resources in tertiary institutions in Benue State are not significant.

Data in table 9 shows that there is a significant (F = 6.579; P = 0.05) difference on the perceived usefulness of online resources among agricultural science lectures in the area. Therefore, the null hypothesis was rejected. Results of post-hoc test to determine where the differences in the group occurs shows that there is a significant difference in the perceived usefulness of online resources between colleges of agriculture and colleges of education and also between universities and colleges of education. However, the result shows that there is no significance difference on the perceived usefulness of online resources among agricultural science lecturers in universities and colleges of agriculture in the area.

Table 9: ANOVA table for perceived usefulness of online resources

ANOVA of mean usefulness	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.151	2	3.075	6.579	0.002
Within Groups	87.872	188	0.467		
Total	94.023	190			

Table 10: Post-hoc test for ANOVA of perceived usefulness of online resources

(I) Type of tertiary institution	(J) Type of tertiary institution	Mean Difference (I-J)	Std. Error	Sig.
University	College of Agriculture	0.40892*	0.11456	0.001
	College of Education	0.22219	0.14871	0.296
College of Agriculture	University	-0.40892*	0.11456	0.001
	College of Education	-0.18673	0.16421	0.492
College of Education	University	-0.22219	0.14871	0.296
	College of Agriculture	0.18673	0.16421	0.492

* The mean difference is significant at the 0.05 level.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of findings

The overall purpose of the study is to assess the online resources usage by lecturers of tertiary institutions in Benue state, Nigeria. The study specifically identified the different types of online resources used by lecturers of agricultural sciences of tertiary institutions in the study area; ascertained the frequency of use of online resources by lecturers of agricultural sciences in tertiary institutions; determined the perceived usefulness of online resources to the respondents; determined the socio-economic and institutional factors that influence the use of online resources; and identified the major constraints associated with the use of online resources.

The study was carried out in Benue state, which is one of the states located in the middle belt, also known as North Central Nigeria. The sample size for the study was 193 respondents. A structured questionnaire was used in collecting data from respondents. Percentage, mean scores, standard deviations, ANOVA and multiple regressions were used in the data analysis.

Results of the study show that a large proportion (33.7%) of the respondents was in the age bracket of 46 and 55 years and the mean age was 42 years. Majority ((82.4%) of the respondents were men and .most (80.3%) of the respondents were men. Majority (52.9%) of respondents had a household size of between 6 and 10 members. The mean household size was 6. A large proportion (48.7%) of respondents possessed first degree or its equivalent; those with PhD made up 9.3% of the population. Respondents holding the title of lecturer II, made up of 19.7%, constituted the largest group. The majority (62.0%) of respondents were those that had work experience of between 1-10 years. The average years of work experience was 10.31years. 88.6% of the respondents spent between 10 to 20 years on formal education. The average years respondents spent on formal education was 20 years.

Majority (50.2%) of the respondents earned between N101, 000 - 200,000 per month and the average income was N181, 413.37.

The main types of online resources used by respondents included electronic journals such as African Journal online (69.9%); electronic books (67.9%); search engines, such as Google and Yahoo (87.0%), as well as encyclopedia, such as Wikipedia (82.9%).

About 40% of respondents made use of electronic journals frequently; 84.0% did not make use of online databases (Web OPAC) at all; 28.5% indicated that they used e-books frequently. 54.9% of respondents indicated

they did not make use of CD - ROM. Search engines were very frequently used by 53.9% of respondents. The percentage of respondents that frequently used encyclopedia was 34.2%.The use of indexes by respondents was limited, as most respondents (39.9%) did not use them. 31.1% or respondents frequently used abstracts; Dictionaries were frequently used by 32.6% of respondents; 42.5% of respondents did not use audio files; 28.5% Seldomly used the files, while 36.8% of respondents Seldomly used video/picture or graphic files.

The online resources that were perceived to be useful to respondents included: Search engines (M = 2.67), electronic journals (M = 2.54) and encyclopedia (M = 2.48). Electronic books (M = 2.43), web OPAC (M = 2.31), dictionaries (M = 2.24), theses and abstracts (M = 2.1, each).

Socio-economic and institutional factors that significantly influenced the use of online resources included age (t = -2.287; p = 0.05) and number of years spent on formal education

(t =2.022; P = 0.05), with age having a negative relationship with the use of online resources and the number of years spent on formal education having a positive relationship with the use of online resources by lecturers in the area.

The constraints that were perceived to had outstanding influence against access and use of online resources included, among others, unstable power supply (M = 2.27), high cost of access and usage of online resources (M = 2.15), non- subscription for relevant online resources by institutions (M = 2.08), slow connection to the internet (M = 2.04), and lack of sponsored training from institutions (M = 2.0).

Conclusions

Based on the findings of the study, the following conclusions were drawn.

(1) The respondents were predominantly matured adults, male, married, with a mean household size of 6 members.
(2) Online resources used included electronic journals, e-books, search engines and encyclopedia.
(3) Most of the online resources were frequently used by respondents, except Web OPAC and audio files.
(4) The online resources that were perceived to be useful to respondents included search engines, electronic journals and encyclopedia.
(5) The socio-economic factors that influenced use of online resources were age and number of years spent on formal education.
(6) The constraints that were perceived to have influenced access and use of online resources included, among others, unstable power supply, high cost of access and usage of online resources), non-subscription for relevant online resources by institutions, slow connection to the internet and lack of sponsored training from institutions.
(7) There were significant differences in the frequency of use of online resources, as well as in the perceived usefulness of online resources, among agricultural science lecturers of tertiary institutions in Benue state.

Recommendations

1. Tertiary institutions should subscribe for such online resources as AGORA, OARE and HINARI, for the benefit of their lecturers, who desire to use relevant online resources but are hindered by cost and technical issues.
2. Staff training and re-training should be built into staff development programs. This will ensure that the (computer, internet and online user) knowledge of staff is constantly updated with relevant skills that are needed in teaching and learning.

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