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Accessibility and Utilization of Electronic Information Resources for Research Activities in Agricultural Research Institutes in Kaduna State, Nigeria

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Abstract: The study investigated the level of accessibility and utilization of electronic information resources in Agricultural Research Institutes in Kaduna state. The major objective of the study is to ascertain the access, purposes and extent of utilization of EIRs for research activities in IAR, NAPRI and NAERLS. The study adopted descriptive cross-sectional survey on a sampled 187 researchers from the population of 373 research scientists using Israel, Glenn (2003) table of determining sample size. Data were collected using questionnaire and analyzed using descriptive and inferential statistics. The study used Unified Theory of Acceptance and Use of Information Technology (UTAUT) model to assess the success of introduction of technology to research activities in Agricultural Research Institutes. The findings revealed a high level accessibility of electronic information resources and high extent rate of utilization for research activities. Research scientists access relevant EIRs on the Internet through passwords obtained from the institutes' libraries and Agricultural CD-ROM for their research activities. E-books and E-Journals, On-line databases and CD-ROM/DVD are used for Laboratory and/or Field Research purposes to ensure qualitative research. The Regression Analysis rejected the null hypothesis which found that accessibility of EIRs have statistically significant correlation with utilization (r=0.763, N=127, r^2=0.582 p<0.031) for enhancing research activities in Agricultural Research Institutes in Kaduna State. The general conclusion of the research is that high level of accessibility of EIRs and high extent rate of utilization will significantly enhance research activities. The study recommended ARIs in Kaduna state should indulge the timely interventions of stakeholders in investments on ICT infrastructural

facilities, computer networks and provide more access point and improve the networking facilities in the institutes.

Background to the Study

Introduction

The emergence of digital age in research institutions has brought about a great dependency on Information and Communication Technologies (ICTs) in the conduct of research activities. There are different ICT tools that provide access to different types of Electronic Information Resources. Agricultural researches are the foundation of a sound agricultural development in any given nation and the success of this depends on access to the actual agricultural information for research purposes span across major subject fields such as plant and animal production and Agricultural Engineering. Agricultural researchers always seek information that will help them to do away with repetitive research and training and to draw from the findings of research conducted elsewhere.

Musa, Sahabi, Lawal & Amishe (2017) opined that scientific research findings are communicated in scholarly journal based on subscriptions or licenses that is expensive to disseminate. Accessibility of electronic information resources in the context of agricultural research is the process of making scientific information readily available and reachable for a particular researcher while utilization of the resources constitutes the process that enables researchers to effectively and efficiently access the soft copy, online or digital information for an increase in the quality and effectiveness of their research activities. Sejane (2017) also submitted that EIR enables researchers have a better access to the work of the global scientific community to incorporate proven scientific knowledge into research. The use of EIRs became necessary because information needs of researchers have grown beyond management of print resources.

Agricultural science researches are not devoid of the problem of incomplete information materials while facing difficulty in accessing the relevant available information. Apparently, accessing such information from internet is very slow due to overload of information or taken long time to download relevant information through internet. In line with this assertion, it becomes imperative for agricultural research institutes to know how to make agricultural information resources readily accessible and conveniently usable to effectively meet the information needs of researchers. Odunlade (2017) noted that librarians of contemporary time should not be regarded as custodians of library materials but exploiters of information and information conduit. This was in assumption that electronic information resources should be made accessible and use purposefully by researchers.

For users to be able to access and effectively use e-resources, they must also have adequate skills for retrieving

information and to evaluate the outputs of the search process. In this regard, for Nigerian Agricultural Research Institutes (NARIs) to make significant impact in international research and publications in this electronic information age, the present state of ICT infrastructure must be redressed. Gakibayo, Ikoja-Odongo and Okello-Obura (2013) submitted that accessibility and utilization of EIRs were not only affected by poor ICT infrastructure and lack of computer skills but also lack of resources and processes of accessing the resources.

It is against this background and unavailable documented studies that this research becomes imperative and is being conducted to investigate the accessibility and utilization of electronic information resources for research activities in Institute for Agricultural Research (IAR), National Agricultural Extension and Research Liaison Services (NAERLS) and National Animal Production Research Institute (NAPRI) in Kaduna State to offer research-based solutions.

Statement of the Problem
Electronic information resources can enhance agricultural research through its dynamic, interactive and engaging content; and it can provide real opportunities for research scientists' instruction. These resources have the potential to motivate and engage scientists in research, relate farm experiences to work practices and provide opportunities for connection between farm and society. Despite the notable effort in agricultural research in Nigeria, the full contribution of

agriculture to the economic growth and poverty reduction has not been realized. Apparently, the major problem of the study is that agricultural science researches are not devoid of the problem of incomplete information materials while facing difficulty in accessing the relevant available information.

The methods and access points to current, relevant and appropriate agricultural information needed for effective utilization of the resources for research activities which culminated to ineffective decision-making, limiting the transformation of the agricultural sector, food production and NARIs global recognition is the central problem of this research. Insignificant research where conducted in this regard while some studies present research gab which this work intends to fill, such as Musa, Sahabi, Lawal & Amishe (2017) argued that dearth of research and development program is attributed to access barriers to high priced scholarly literature, Aina (2014) on Awareness, Accessibility and Use of Electronic Databases revealed that only 40 (47.1%) of respondents had fully accessibility to academic journal, Ebscohost and JSTOR databases while Odunlade (2017) found out that there is high level of accessibility but no relationship with utilization. The above studies present knowledge gabs which this study intends to fill in Agricultural Research Institutes.

This trend is being confronted with numerous problems including institutional, Infrastructure and IT knowledge. However, National Agricultural Research Institutes (NARIs) are lagging behind their counterparts in advanced nations in

adoption, integration, diffusion and application of basic ICT infrastructures. The low research and publication productivity of agricultural researchers may be attributable in part to the accessibility problem. Therefore, this trend needs to be empirically studied as insignificant comprehensive studies have been conducted on the accessibility and utilization of this resources for research activities in Agricultural Research Institutes (ARIs) particularly in Kaduna State.

Objectives of the Study

The main objective of this study is to investigate the accessibility and utilization of electronic information resources in Agricultural Research Institutes in Kaduna State for research activities. The specific objectives are to:

1. Determine the extent of accessibility of electronic information resources by research scientists to support its utilization in the Institutes under study;
2. Ascertain the extent of utilization of the electronic information resources for research activities in the Institutes under study;
3. Assess the purposes for which research scientists utilize electronic information resources in the Institutes under study;
4. Determine the relationship between accessibility of electronic information resources and their utilization for research activities in the Institutes under study
   Determine the relationship between accessibility of electronic information resources and their

utilization for research activities in the Institutes under study

Research Questions

The research addresses the following questions:

1. What is the extent of accessibility of electronic information resources by research scientists to support its utilization in the Institutes under study?
2. What is the extent of utilization of the electronic information resources for research activities in the Institutes under study?
3. What are the purposes for which research scientists utilize electronic information resources in the Institutes under study?
4. What is the relationship between accessibility of electronic information resources and their utilization for research activities in the Institutes under study?

Research Hypothesis

A broad Null Hypothesis was formulated to guide the conduct of this study and was tested at 0.05 level of significance (95% confidence).

Ho$_1$. The accessibility of electronic information resources has no statistically significant correlation with utilization of the resources for enhancing research activities in Agricultural Research Institutes in Kaduna State.

This study is significant in the process of developing relevant ICT policies and strategies toward effective and sustainable electronic collection development in Nigerian Agricultural Research Institutes, as well as promoting accessibility and utilization

of relevant electronic resources for research scientists. The research findings invariably will have additional value to the existing body of literature theoretically and enhance research practice. Thus, these theories would provide the basis towards proffering solution to the problem of non-accessibility and under-utilization of electronic resources in Nigerian Agricultural Research Institutes.

Review of Related Literature
Accessibility of Electronic
Information Resources for Research
Activities

Accessibility is a general term used to describe the degree to which resources, services, products are obtainable by as many people as possible. Aina (2011) stated that accessibility determines the speed at which an information output in any formats is obtained. In agricultural researches and food security studies, Agricultural Research Institutes play a fundamental role in providing researchers with current print and electronic resources. This facilitates support research activities.

The advancing digital age characterized with applications, access and use of electronic resources in the research environments for teaching and research is transforming the nature of information use in research institutes. Agricultural researchers involved in research are in need of adequate access to modern electronic resources to support their research activities. Studies such as Aina (2014) on Awareness, Accessibility and Use of Electronic Databases revealed that only 40 (47.1%) of respondents had fully accessibility to academic journal, Ebscohost and

JSTOR databases while Odunlade (2017) found out that there is high level of accessibility but no relationship with utilization. However, Sejane (2017) investigate the access to and use of Electronic Information Resources in the Academic Libraries of the Lesotho Library Consortium shows the e-resources which were mostly accessed to include e-mail, search engines, websites and OPAC, while e-journals, full-text databases, IRs and reference databases were least accessed. In the same vein, Musa, Sahabi, Lawal & Amishe (2017) studied Academic Librarians Research Productivity amidst Open Access Resources indicated that support for accessibility policy was considered very important as their main factor for using Open Access resources with 131 (75.3%) responses, accessibility to publications at no cost with 135 (77.6%) responses while visibility and speed, which exposes OA scholarly works to a large readership were the major factor influencing them to use OA publications with 141 (81%) responses.

However, Song and Song (2017) study on the Accessibility and Utilization of EIRs for Research Development of postgraduate students revealed that the correlation showed that utilization of EIRs and enhancements of research development is positive and the study concludes that EIRs is necessary for postgraduate students' research activities. The descriptive analysis revealed that very few respondents rated they access Electronic Information Resources from the E-Library and the University e-library Network but there is a very high electronic literacy skill

among the postgraduate students who can conveniently access needed information from EIRs. The study further showed that EIRs facilitate faster and convenient access to relevant information, increase richness of work thereby enhancing research productivity.

From the above review, knowledge gaps were identified, although, empirical studies were conducted but literature on quantitative studies to determine the accessibility of EIRs to facilitate utilization and their relationships in ARIs setting on the subject matter seems to be relatively insignificant. Therefore, this study aimed at filling this knowledge gap.

Purpose of Utilizing Electronic Information Resources

Research and the publication of research outcomes are basically the academic routes through which scientists discover new knowledge and use it to consolidate or upgrade the existing knowledge. Other attributes involved in research output could be linked to individual's willingness or commitment to seek information where it is highly available.

Priyadharshini, Janakiraman & Subramanian (2015) in their case study in the Agricultural College and Research Institute, Madurai found out that the most frequently used EIRs are E-journals (70%); followed by e-books (65%) and online databases (50%), while the least preference given to the use of e-archives and CD ROM databases (5%). In a similar study, Ansari & Bushra (2010) surveyed the use of EIRs in Karachi and found out that about one-third of respondents use electronic resources for research while one-quarter to one third use it to prepare

lectures and gain subject knowledge, Electronic resources are mostly used for research and lecture preparation. Alhassan & Macaulay (2015) found out the purpose of utilization of the EIRs as enabling access to current and up-to-date information, faster and easier access to information, and access to a wider range of information. Gakibayo, Ikoja-Odongo and Okello-Obura, (2013) study found out that although Mbarara University library subscribes to a number of databases including Emerald and EBSCO, 57.5% of the respondents agreed that the available EIRs help them to access a wider range of information which provides full-text journal articles.

This review also identified a knowledge gap of insignificant works on the relationships between the electronic information resources and the purposes for which they are being utilized for research activities particularly in Nigerian Agricultural Research Institutes on the subject matter. Therefore, this study aimed at filling this knowledge gap.

The Unified Theory of Acceptance and Use of IT (UTAUT)

In view of the observed weaknesses of individual theories/models in the study of information technology acceptance, Venkatesh, Morris, Davis & Davis (2003) reportedly examined eight prominent models, empirically compared them, and then formulated a new model or "unified model". The unified model is referred to as the Unified Theory of Acceptance and Use of Information Technology (UTAUT). Employing this theory, researchers have tried to establish the rationale behind

technology diffusion and acceptance in organizations, with special emphasis on e-resources, e-learning, and e-services. Studies such as Ayele & Sreenivasarao (2013) and Miller & Khera (2010);" had employed the model of UTAUT and found it to be a profound framework frequently used in information system studies to predict and explain access and use of computer-based applications and solutions.

According to the UTAUT, the four main determinants of behavioral intention and actual ICT usage are performance expectancy, effort expectancy, social influence, and facilitating condition (Figure 1 represent the structure of UTAUT). These variables are said to be moderated by age, gender, experience, and voluntariness of use (Ghobakloo, Zulkifli & Aziz 2010).
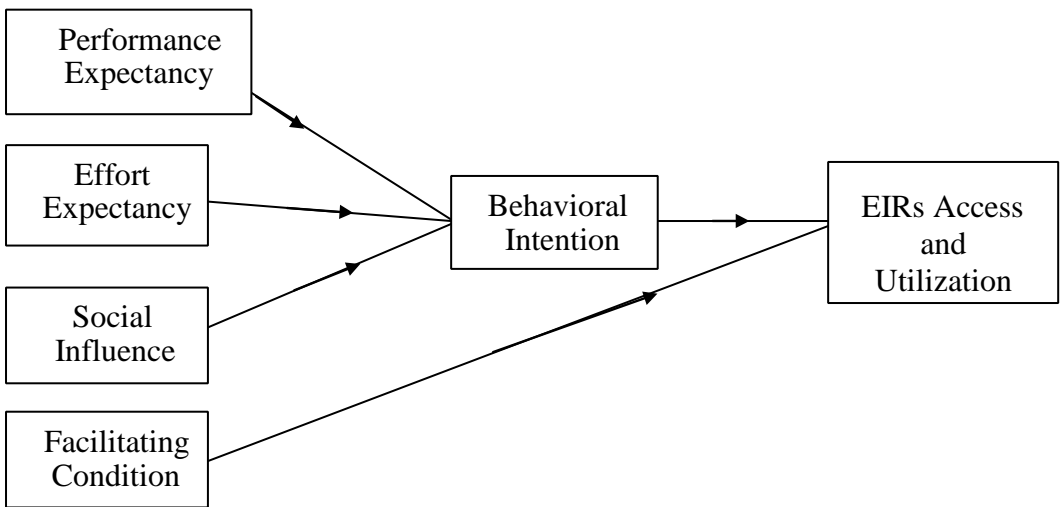
Fig. 1: Unified Theory of Acceptance and Use of Information Technology (UTAUT)

Application of UTAUT to the Study
Unified Theory of Acceptance Use of Technology (UTAUT) as augured by AlQudah, (2014) explained the degree of acceptance of the use of information technology. This theory is applicable to this study to assess whether the research scientists will be able to accept technologies in the conduct of research.

Performance Expectancy: The degree to which Research Institutes believe that access to a particular type of electronic

information resource will help in enhancing research activities.

Effort Expectancy: The degree of ease of access and use of electronic information resources.

Social Influence: The degree to which research institute perceives that its professional peers believe it should access and use electronic information resource in research activities.

Facilitating Condition: Is the degree to which researchers believe that institutional ICT facilities to support accessibility and utilization of EIRs will enhance research activities.

Therefore, the performance expectancy and facilitating conditions are the two major UTAUT variables used in guiding the present study within the framework of research activities in Agricultural Research Institutes in Kaduna state. The theory will help ARI to assess the success of introduction of technology and motivate research scientists to accept the systems.

Research Methodology
The research approach used in the study was quantitative approach, due to its strength on objectivity and testing of hypotheses. The Cross – Sectional Survey was adopted for the study. This research design enables a researcher to find out the relationship between measures of different variables obtained at the same time.

Research Instrument and Data Analysis Techniques
Structured adapted questionnaire comprising two (2) Demographic data and three (3) Research Questions containing 29 items were administered to research scientists using the stratification technique of the study. The study used SPSS Version 16.0 Software for the analysis using descriptive statistics for the research questions and inferential statistics for the hypothesis of the study. The study also used a decision rule to accept all items in the descriptive statistics with mean mark of 2.5 and above and reject items with less than 2.49 mean marks on scale 1 to 5.

Validity and Reliability of the Instrument
This research used the face validity of the instrument by giving the questionnaire to two specialists in the area of ICT in IAR Kano station. The judgment and assessment of the experts helped to determine the extent to which the items accurately cover the desired domain. Their recommendations were considered and effected on the instrument. While a pilot study was conducted at the Kano substation of the Institute for Agricultural Research located in Kano State on a sample 20 research scientists, the results were used for the reliability test of internal consistency of items. The pilot study analysis revealed that the items on EIRs are relevant to agricultural researches for research purposes. Cronbach's Alpha reliability analysis was run to obtain the internal consistency and the following statistics were obtained; Accessibility of EIRs for research activities = **0.906**, Extent of Utilization of EIRs for Research Activities = **0.841** and Purpose of utilization of EIRs by research scientists = **0.887.** The Cronbach's Alpha computed for the three items is **0.878** which falls on the scale of "Good Items" this translate a very strong reliability.

Population and Sampling Technique
The population of the study comprised 370 Agricultural Research Scientists (IAR = 248 research scientists, NAERLS = 63 research scientists and NAPRI = 59 research scientists) in Kaduna state. A stratified sampling technique was adopted for the study. To determine the sample size, the study

employed the Israel (2003) table for determining sample size and its formula which is $SS = \frac{N \times S}{TP}$ where: SS = Sample Size, N = Number of population of each Institution, S = Sample Size taken and TP = Total Population. This constructed a 95% confidence with about ±5.0% margin of error.

Table 1: Research Sample Size

S/No	Name of Institute	Sample Size	Sample Taken
1	Institute for Agricultural Research (IAR)	$SS = \frac{249 \times 187}{373}$	125
2	National Agricultural Extension and Research Liaison Services (NAERLS)	$SS = \frac{64 \times 187}{373}$	32
3	National Animal Production Research Institute (NAPRI)	$SS = \frac{60 \times 187}{373}$	30
		Total	187

Therefore, the sample size taken is **One Hundred and Eighty-Seven (187)**

Findings and Discussions

Based on the objectives of the study, to determine whether all strata of the population were captured, the respondents were asked to provide their demographic data relevant to the study. A total of 187 copies of questionnaire were distributed to the respondents and the analysis revealed that 60 (32.1%) copies of the questionnaires were missing while 127 (67.9%) copies were returned and found useful which include IAR 75 (63.03%), NAERLS 23 (19.33%) and NAPRI 21 (17.64%). 30 (23.6%) respondents are from the field of Agricultural Economics and Extension, 50 (39.4%) Plant and Animal Science, 25 (19.7%) Soil Science and Crop Protection, 13 (10.2%) Agronomy while only 9 (7.1%) respondents are from the field of Agricultural Engineering and Irrigation.

Key

VHE	=	Very High Extent
LE	=	Low Extent
UN	=	Undecided

HE	=	High Extent
NA	=	Not Applicable

Research Objectives Analysis

Research Question One: What is the extent of accessibility of electronic information resources by research scientists to support its utilization in the Institutes under study?

Level of Accessibility of Electronic Information Resources

In order to ascertain the level of accessibility of EIRs by research scientists, they were asked to indicate their level of accessibility of electronic information resources. The data obtained are summarized and presented on table 2.

Table 2: Level of Accessibility of EIRs

S/N	Accessibility	VHE	HE	LE	NA	Mean	Decision
1	I access relevant electronic information resources on the Internet for my research through passwords obtained from the institutes' libraries	127	0	0	0	4.0000	Accepted
2	I access and use electronic information resources in the institute's library	63	64	0	0	3.4961	Accepted
3	I access online databases of the institute outside the library's network	79	32	16	0	3.4961	Accepted
4	I access Agricultural CD-ROM databases for my research activities	63	24	40	0	3.1811	Accepted
5	I use the library's LAN to access electronic resources for my research	45	15	67	0	2.8268	Accepted
6	I prefer to access electronic information resources for my research activities than the print materials	127	0	0	0	4.0000	Accepted
7	Policy on accessibility and use of electronic information resources are effective for research activities	127	0	0	0	4.0000	Accepted

Table 2 represents the level of accessibility of Electronic Information Resources by research scientists for research activities. All the items presented on the table are accepted based on the decision rule of 2.50 bench mark of the study while none of the respondents rated not applicable of the items to the level of accessibility of the resources for his/her research activities as indicated from the analysis.

From the analysis on the Table, it was revealed that all the respondents indicated that they access relevant EIRs on the Internet through passwords obtained from the institutes' libraries, they prefer to access EIRs for research than the print materials and policy on accessibility and use of EIRs are

effective for research activities (mean = 4.00). It further showed that accessibility and utilization of EIRs in the institute library (mean = 3.49), access to online databases of the institute outside the library's network (mean = 3.49), accessing Agricultural CD-ROM databases (mean = 3.18) and using the library's LAN to access EIRs (mean = 2.82) indicated a high level of access in the institutes by the research scientists.

This finding corroborated the studies of Musa, Sahabi, Lawal & Amishe (2017) whose major findings indicated that support for accessibility policy was considered very important as their main factor for using OA resources with 131 (75.3%) responses. While the finding is

in contrast with the study of Song and Song (2017) where the descriptive analysis revealed that very few respondents (1.28) rated they access EIRs from the E-Library and the University Network.

The theoretical unpinning of Unified Theory of Acceptance and Use of Information Technology (UTAUT) on this finding presupposes that Agricultural CD-ROMs and the library's LAN has perceived ease of use and therefore, there performance expectancy for research activities of the respondents has relatively high significant relationship with research activities.

Table 3: Mean Descriptive Analysis of level of Accessibility of EIR

Descriptive Statistics for Total Responses					
Item	Very High Extent	High Extent	Low Extent	Not Applicable	Mean	Decision
Level of Access of EIRs	631 (70.98%)	135 (15.19%)	123 (13.84%)	0 (0.00%)	3.5714	Highly Significant
Valid N (Total Response)	889					

Table 3 represents the mean descriptive analysis of level of accessibility. It revealed that out of the 127 valid questionnaires analyzed, all the research scientists' respondents to the 7 items which generated a total of eight hundred and eighty-nine (889) responses from the 7 items of level of accessibility of electronic information resources. From the analysis, 631 (70.98%) responses rated "Very High Extent", 135 (15.19%) responses rated "High Extent" and 123 (13.84%) responses rated "Low Extent while no response for "Not Applicable." This shows that over 84% of the total responses rated high extent the level of accessibility of EIRs in the institutes (mean=3.57) which is highly significant.

Research Question Two: What is the extent of utilization of the electronic information resources for research activities in the Institutes under study?

Extent of Utilization of EIRs by Research Scientists
The data for the extent of utilization of EIRs were obtained, summarized and presented on table 4 below.

Table 4: Extent of Utilization of EIRs by Research Scientists

S/No	Utilization of EIRs	VHE	HE	LE	NA	Mean	Decision
1	E-dissertations, E-books and E-Journals	127	0	0	0	4.0000	Accepted
2	Audio-Visual graphical images in agriculture	65	37	19	6	3.2677	Accepted
3	Audio reports on Agricultural Research Development	65	37	19	6	3.2677	Accepted
4	Current Awareness Services (CAS) to enquire about status of newly subscribed EIR databases	65	37	19	6	3.2677	Accepted
5	On-line databases and Scholarly Websites	82	44	1	0	3.6378	Accepted
6	Offline Library Repository (such as D–Space)	65	61	1	0	3.4961	Accepted
7	CD-ROM/DVD Searching Service	86	24	17	0	3.5433	Accepted
8	Selective Dissemination of Information (SDI) for online reference services on EIR	6	31	86	4	2.3071	Not Significant
9	Online Public Access Catalog (OPAC) services to access databases	8	23	90	6	2.2598	Not Significant
10	Photocopy, Printing and Scanning Services	64	43	20	0	3.3465	Accepted

Table 4 represents the extent of utilization of EIRs by research scientists. From the analysis on the table, it was revealed that the respondents indicated they utilize E-dissertations, E-books and E-Journals (mean=4.00), On-line databases and Scholarly Websites (mean=3.63) and CD-ROM/DVD Searching Service (mean=3.54) for research. Others include Audio-Visual graphical images and audio reports on Agricultural Research Development (mean=3.26), Current Awareness Services (CAS) (mean=3.26), Offline Library Repository (such as D–Space) (mean=3.49) and Photocopy, Printing and Scanning Services (mean=3.34) are

also highly utilized. The analysis also shows that Selective Dissemination of Information (SDI) for online reference services (mean=2.30) and Online Public Access Catalog (OPAC) services to access databases (mean=2.25) are not significantly utilized EIRs by the research scientists.

The finding of the analysis is supported by Priyadharshini, Janakiraman & Subramanian (2015) in their case study and found out that the most frequently used EIRs are E-journals (70%); followed by e-books (65%) and online databases (50%), while the least preference were given to the use of e-archives and CD ROM databases (5%). The finding contrasted

the work of Sejane (2017) who submitted that EIRs are rarely utilized, only 12 (30.8%) respondents indicated e-journals were the most used resources and only four (10.3%) indicated CD-ROMs. This low rate of utilization was as a result of lack of accessibility of the resources.

This is based on the theoretical underpinning of Unified Theory of Acceptance and Use of Information Technology (UTAUT) construct of

Performance Expectancy (PE) which presupposes the degree to which the respondents believe that a particular type of electronic information resource will help in enhancing research activities is effective on this variable. Therefore, the determinant of usage intention and behavior as identified by this construct means that the related EIRs are expected to be adequately utilized by research scientists for their research activities.

Table 5: Mean Descriptive Analysis of Utilization of EIR

Descriptive Statistics for Total Responses						
Item	Very High Extent	High Extent	Low Extent	Not Applicable	Mean	Decision
Extent of Utilization of Electronic Information Resources	633 (49.84%)	337 (26.54%)	272 (21.42%)	28 (2.20%)	3.2394	Highly Significant
Valid N (Total Response)	1,270					

Table 5 represents the mean descriptive analysis of extent of utilization of EIRs by research scientists. The analysis revealed that out of the 127 valid copies of questionnaire analyzed, they generated a total of one thousand two hundred and seventy (1,270) responses where 633 (49.84%) responses were rated "Very High Extent", 337 (26.54%) responses rated "High Extent", and 272 (21.42%) responses rated "Low Extent" while only 28 (2.20%) responses rated "Not Applicable". This represented over 76% of the total responses rated high extent utilization of EIRs in the

institutes for their research activities (mean=3.23) which is highly significant.

Research Question Three: What are the purposes for which research scientists utilize electronic information resources in the Institutes under study?

Purpose of Utilization of EIRs by Research Scientists
The respondents were asked to indicate research purpose for which they utilize Electronic Information Resources. Their responses were summarized and presented on table 6.

Table 6: Purpose of Utilization of EIR by Research Scientists

S/No	Item	VHE	HE	LE	NA	Mean	Decision
1	For Laboratory and/or Field Research purposes to ensure qualitative, current and reliable research	127	0	0	0	4.0000	Accept
2	I use EIRs to search for new relevant topics in the area of agricultural research	63	0	38	26	2.7874	Accept
3	I prefer EIRs than print resources for convenience purposes	127	0	0	0	4.0000	Accept
4	I use the EIRs to consult colleagues through e-mail or discussion group	0	16	48	63	1.6299	Not Significant
5	Write Seminar, Conference or exhibition Research Papers with the aid of EIRs	62	54	0	11	3.3150	Accept
6	Update Knowledge and generate new information to serve as basis for further research	116	0	0	11	3.7402	Accept
7	Communication with friends and colleagues on new trends in agriculture	0	13	60	54	1.6772	Not Significant
8	To submit my research for publication to repositories or online databases	114	0	0	13	3.6929	Accept
9	To Check for Recent Resources and Trends in Agricultural Research and Development	116	0	0	11	3.7402	Accept
10	Social and Personal reasons	0	15	55	57	1.6693	Not Significant

Table 6 represents the analysis of purpose of utilization of EIRs. From the analysis on the table, it revealed that all the respondents (127 responses, mean=4.00) indicated that they make use of EIRs for Laboratory and/or Field Research purposes to ensure qualitative, current and reliable research and the preference of EIRs to print resources for convenience purposes with very high extent. The analysis further revealed that item 2, 5, 6, 8 and 9 with the following mean 2.78, 3.31, 3.74, 3.69 and 3.74 respectively are accepted as the purpose of utilization of EIRs by research scientists. It further revealed that utilization of EIRs to consult colleagues through e-mail or discussion group (mean=1.62), Social and Personal reasons (mean=1.66) and Communication with friends and colleagues on new trends in agriculture (mean=1.67) are not significant EIRs in the institutes for research activities and therefore rejected.

The finding corroborates Ansari & Bushra's (2010) studies who found out that about one-third of respondents use electronic resources for research while one-quarter to one third use it to prepare lectures and gain subject knowledge and for research and lecture preparation. The study also contrasted Daramola, (2016) who shows the reasons for using e-resources in FUTA library and found out that majority of the respondents

(83.33%) visited the e-resources section in order to access their e-mails and

82.22% were there to do assignments.

Table 7: Mean Descriptive Statistics of Purpose of Utilization

Descriptive Statistics of Total Responses						
Item	Very High Extent	High Extent	Low Extent	Not Applicable	Mean	Decision
Purpose of Utilization of Electronic Information Recourses (EIRs)	725 (57.09%)	98 (7.72%)	201 (15.83%)	246 (19.37%)	3.0252	Highly Significant
Valid N (Total Responses)	1,270					

Table 7 represents the mean descriptive statistics of purpose of utilizing EIRs by research scientists in Agricultural Research Institutes in Kaduna State. From the table, the analysis shows that out of the 127 valid questionnaires analyzed, they generated a total One Thousand Two Hundred and Seventy (1,270) responses, where 725 (57.09%) responses were rated "Very High Extent", 98 (7.72%) responses rated "High Extent", 201 (15.83%) responses rated "Low Extent" while 246 (19.37%) responses rated "Not Applicable". The analysis further shows that over 65% of the total responses rated their purpose of utilization of the resources high extent. This signifies that the resources are highly significant (mean=3.02) to research activities in ARIs in Kaduna state.

Research Hypothesis Analysis
To taste the hypothesis, Statistical Package for Social Sciences (SPSS) software was used in order to understand the correlations between the independent variable (Accessibility of EIRs) on the dependent variable (Utilization of EIRs for enhancing research activities) the research used the Linear Regression Analysis on SPSS to determine the relationships between the ordinate variables of the study.

$H_0.1.$ The accessibility of electronic information resources has no statistically significant correlation with utilization of the resources for enhancing research activities in Agricultural Research Institutes in Kaduna State.

Table 8: Regression Analysis of Availability and Utilization of EIRs

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.431	.214		2.010	.031
	Level of Accessibility of Electronic Information Resources	.786	.060	.763	13.184	.000
a. Dependent Variable: Utilization of EIRs						

Table 8 represents the linear regression analysis of the level of accessibility and extent of utilization of EIRs for enhancing research activities in Agricultural Research Institutes in Kaduna State. The analysis on the table revealed that the correlation is significant at 0.01 level of confidence and is positive with r = 0.763 correlation coefficient. The coefficient is close to a perfect straight line which reveals a very strong significant relationship between the variables. The analysis shows that a unit increase in accessibility of the resources will lead to more extent of utilization by research scientists for enhancing research activities in the institutes.

The table further revealed the unstandardized B column value of 0.786 which is the slope of line of interception and an indicator of the level of effect the predictor variable that is accessibility of EIRs has on the extent of utilization of the resources. In practice it means an average increase in accessibility of EIRs will lead to 0.786 increase in utilization. A 5% increase in accessibility of EIRs will lead to (5×0.786) 4-unit increase in the extent of utilization of electronic information resources in ARIs in Kaduna state. This analysis further proves that the coefficient is not negative; increase in one variable will not decrease the other variable.

Table 9: Regression Model Summary of Accessibility of EIRs

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.763[a]	.582	.578	.26348
a. Predictors: (Constant), Accessibility of EIRs				

Table 9 represents the regression model summary of accessibility and utilization of EIR. The analysis revealed the regression equation (r = 0.763) and the 'R' Square coefficient ($r^2 = 0.582$). The 'R' value revealed how closely the data points resemble perfectly straight-line

relationship while the 'R' Square coefficient ($r^2 = 0.582$) measures how much variation in the dependent variable is explained by variation in the independent variable. That is 58% of the variation in utilization of electronic information resources by research

scientists is explained by the variation in their level of accessibility of the different types of electronic information resources in Agricultural Research Institutes in Kaduna State.

The table further revealed in practice, that accessibility of electronic information resources in Agricultural Institutes in Kaduna State accounts for over 58% influence on utilization of the resources for enhancing research activities of researchers while less than 42% of the influence of utilization are responsible from other factors.

This finding corroborated the works of Musa, Sahabi, Lawal & Amishe (2017) that there was significant perceived positive effect of utilization of Open Access Resources on research productivity at the surveyed Nigerian universities as a result of accessibility of the resources. In the same vein, this finding also is in support of Odunlade's (2017) study where his analysis revealed that every access to information resources would increase teaching effectiveness by 0.48 or 48% which shows a high relationship between availability of EIRs and its level of accessibility.

Accepting or Rejecting the Null Hypothesis of the Study

According to Bornmann & Leydesdoff (2013) if the P value significant level is less than 0.05 (p < .05) the Null Hypothesis of the study will be rejected while if the P value significant level is greater than 0.05 (p > .05) the Null Hypothesis of the study will be retained. Therefore, according to this analysis, the H_0 is rejected (p < 0.05 i.e. Sig = 0.31), because there is sufficient evidence of significant correlation between accessibility and utilization of electronic information resources. The difference between the means are not happening due to chance but as a result of the influence of the independent variable "Accessibility of EIRs".

Therefore, the accessibility of electronic information resources has statistically significant correlation with utilization of the resources (r=0.763, N=127, r^2 = 0.582 p < 0.031) for enhancing research activities of research scientists in Agricultural Research Institutes in Kaduna State.

Summary of the Findings

1. The theoretical underpinning of Unified Theory of Acceptance and Use of Information Technology (UTAUT) presupposes that the performance expectancy of the electronic information resources for research activities has relatively high significant relationship with research activities. Therefore, the determinant of usage intention and behavior as identified by this model means that the related EIRs are expected to be adequately accessed and utilized by research scientists for their research activities.

2. There is high level of accessibility of electronic information resources and high extent rate of utilization of the resources for research activities in Agricultural Research Institutes in Kaduna state.

3. Research scientists access relevant EIRs subscribed by the institutes on the Internet through passwords obtained from the institutes' libraries to access online databases and Agricultural CD-ROM for their research activities

4. Research scientists utilize E-dissertations, E-books and E-Journals, On-line databases and Scholarly Websites and CD-ROM/DVD Searching Service for their research activities.
5. Research scientists make use of EIRs for Laboratory and/or Field Research purposes to ensure qualitative, current and reliable research and they give preferences to EIRs for convenience purposes in their research activities.
6. Accessibility of electronic information resources have statistically significant correlation with utilization of the resources for enhancing research activities of research scientists in Agricultural Research Institutes in Kaduna State.

Conclusion

The study basically aimed at investigating the level of accessibility and utilization of EIRs for research activities in Agricultural Research Institutes in Kaduna State. The general conclusion of the research is that there is high level of accessibility of electronic information resources and high extent rate of utilization of the resources which significantly enhance research activities in Agricultural Research Institutes in Kaduna State. The study further concludes that research scientists access relevant EIRs on the library's network through passwords obtained from the institutes' libraries for their research activities and that policies on access and use of EIRs are effective for research activities.

The study also concludes that the theoretical framework of UTAUT is highly significant in expressing the Facilitating Conditions (FC) for determining level of accessibility that support extent of utilization of EIRs by research scientists for effective research activities in Agricultural Research Institutes in Kaduna state.

Recommendations

Based on the conclusions drawn from the findings of the study, it offers the following recommendations:

1. There is need for timely interventions of National Agricultural Research Institutes and Federal Ministry of Agriculture to massively increase investments on ICT infrastructural facilities such as computers and computer networks, robust, reliable and sustainable Internet connectivity in order for ARIs to become integrated into global research community in enhancing research activities.
2. The study observes that the more enabling access points to electronic information resources the better increased rate of utilization of the resources by research scientists. Thus, Agricultural Research Institutes in Kaduna state should provide more access point and improve the networking facilities in the institutes' libraries for the enhancement of effective utilization of EIRs in research activities.
3. Agricultural Research Institutes libraries in Kaduna state should upgrade their Local Area Network (LAN) services in the libraries to

ensure effective accessibility of and utilization of electronic information resources for research activities.

4. Research scientists on their own should be active on utilization of EIRs in view of the paradigm shift in information access and use from print to e-resources and its

significant positive effect on research activities. This should involve constant acquisition of relevant information literacy skills to enable them to access and use specific online databases relevant to their research activities.

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