

Awareness and Use of Electronic Resources as Predictors of Scholarly Publication Output of Researchers in National Agricultural Research Institutes in Nigeria

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Abstract

The study that directed this article examined the extent of awareness of e-resources, their frequency of use and the prediction of scholarly publication output among researchers in National Agricultural Research Institutes (NARIs) in Nigeria. The survey research method of co-relational type was adopted for the study. The population for the study comprised researchers in 15 NARIs in Nigeria. Total enumeration was used, and the total population of the identified researchers was 1 089. A questionnaire was the main instrument for the study, and out of 1 089 questionnaires distributed, 868 were returned, giving a return rate of close to 80%. The data were analysed using descriptive statistics, which included means, percentage, standard deviation and variance. The findings showed a high awareness of e-resources among researchers. It also confirmed a moderate level of use of e-resources among the researchers. The study found a correlation between awareness and the use of e-resources. Also, from the study, it was discovered that the awareness and use of e-resources determined the scholarly publication output of researchers. Recommendations were made on the findings of the study, namely that library managements within NARIs should endeavour to sustain the awareness of e-resources among researchers through the deployment of new and relevant approaches so that their productivity will not decline.

Keywords: awareness; use of e-resources; scholarly publication; Agricultural Research Institute; Nigeria

Introduction

In order to enhance the scholarly publication output of researchers, the availability of some important elements—such as concise and comprehensive scholarly information—is crucial. It is important for the enhancement of researchers' scholarly publication output, because it will help researchers to have knowledge of research projects already undertaken in their area of research interest, and it is expected that it will stimulate them to work diligently on their own research interest. Hence, electronic information resources (also referred to as e-resources) are dependable information sources that researchers should be aware of and use maximally at every stage of their research work. Electronic information resources are packaged to provide researchers with prompt and relevant scholarly information. As explained by Okon, Ngulube, and Onyancha (2015), electronic information resources are information stored in electronic format in computer-related facilities. The importance of electronic information resources was confirmed by Egunjobi and Awoyemi (2013), stating: "Electronic resources are more of a tool to assist in conducting research and a means for researchers to scan much information quickly."

In view of the importance of electronic resources, researchers are expected to be aware of them and have the desire to use them to facilitate research work. With the awareness of these resources, researchers will be able to identify research projects in their institution and those in other institutions and then make maximum use of them to facilitate their research work. Efforts to make researchers aware of e-resources are being intensified by libraries that have subscribed to relevant e-resources for their users. It was observed from the findings of some studies conducted on the use of e-resources that library management in various libraries where e-resources are available has created awareness of these resources. They have also intensified efforts in encouraging their library users to make maximum use of these resources in order to have a positive impact on their teaching, research and scholarly publication output so that the huge investment of subscribing to electronic resources is justified.

Scholarly publication output, according to Antleman (2014), is a broad term reflecting various processes through which scholars showcase and exchange information with one another in the course of knowledge creation. It is also described as formal and informal processes through which research results and other scholarly works are disseminated to other researchers, students, policy makers and the public (Solomon 2007). Scholarly publication output of researchers, according to Ronald (2014), is found in scholarly journals, conference proceedings, books and grey materials. The importance of scholarly publication output of researchers was explained by Sedikadiwa (2005) as the image of a scholar and that the scholar is expected to publish his research in accordance with the guidelines established by the university or research institutes where the researcher works. Sedikadiwa (2005) expresses further that apart from sustaining employment, scholarly publication output is important for other reasons such as offering

opportunities such as visibility, advancement in salary, course releases and a unique and important kind of self-education.

In Nigeria and many other countries of the world, it is observed that the improvement and invention of new agricultural technologies hinge on the research activities of scholars in different agricultural research institutes and universities. In Nigeria, there are 15 agricultural research institutes under the umbrella of National Agricultural Research Institutes (NARIs). The agriculture research institutes in this group are spread across all the geo-political zones of the country. Each of the institutes has a unique national mandate for agricultural development, but despite their uniqueness in the mandate, the researchers in the institutes collaborate to conduct research to improve agricultural productivity by inventing technologies to solve agricultural problems. The 15 research institutes are supervised by an agency of the Federal Government of Nigeria, called the Agricultural Research Council of Nigeria (ARCN). The researchers in the 15 NARIs formed the population of this study. Though all the institutes are coordinated by the ARCN, there are some differences in their administrative structures. This is because four of the institutes are affiliated with Nigerian universities, and the research staff in those institutes use university administrative nomenclature and grading systems, while the remaining 11 institutes are also under the Federal Government of Nigeria, but operate a different administrative nomenclature specially approved for them by the head of the federal civil service. Apart from fulfilling educational requirements, researchers are also expected to have scholarly publication output from the result of their research. This is often used to quantify their level of productivity. Therefore, this study was conducted to find out if researchers in NARIs in Nigeria are aware of and use electronic information resources to support their research work to enhance the quality and quantity of their scholarly publication output.

Statement of the Problem

From FAO (Federal Agriculture Organisation) technical guidelines, it is revealed that about 70% of agricultural findings in Africa are published as grey literature, and only a very small percentage find their way to scholarly journals. The scenario shows that there may be deficiencies in the quality of research or writing of research findings. This could be caused by many factors, among which is a lack of concise, comprehensive and correct scholarly information for agricultural researchers in Africa to guide their research work and their writing of scholarly publication that will be acceptable for publication in reputable journals. This study, therefore, was conducted to determine the level of awareness, the use of electronic information resources and to confirm if such awareness and use of these resources can predict the scholarly publication output of researchers in NARIs.

Objectives of the Study

The main objective of the study was to determine the level of awareness and use of e-resources by researchers in NARIs in Nigeria and also to confirm if such awareness and

use of these resources can predict their scholarly publication output. The specific objectives of the study were to:

- Determine the level of awareness of e-resources among researchers in NARIs in Nigeria.
- Find out the frequency of use of e-resources among researchers in NARIs in Nigeria.
- Ascertain if awareness of e-resources by researchers can determine their scholarly publication output.
- Determine if the use of e-resources by researchers in NARIs can determine their scholarly publication output.
- Ascertain if there is any relationship between awareness and use of e-resources by researchers in NARIs.

Hypotheses

The following null hypotheses were tested in the study at a 0.05 level of significance:

- There is no significant relationship between scholarly publication output and awareness of e-resources among researchers in NARIs.
- There is no significant relationship between scholarly publication output and the use of e-resources among researchers in NARIs.
- There is no significant relationship between awareness and the use of e-resources among researchers in NARIs.

Literature Review

Due to the popularity of e-resources, different studies are being undertaken to confirm the awareness of library users, particularly lecturers and research scientists. In the study conducted by Radhakrishnan (2012) on awareness of online information among lecturers at tertiary institutions in Coimbatore, the findings showed that 475 (95.2%) participants were aware of the electronic database, and 24 (4.8%) were not aware. Similarly, Ibegwan, Ogunyade and Ajuwon (2013) carried out research on awareness of electronic information resources by researchers in two health institutions in Nigeria. The outcome of the investigation showed that 80% of those who participated in the study, who are researchers at different stages of their careers, indicated that they were aware of electronic information resources in the libraries of the health institutions studied. To further enhance awareness of electronic resources among researchers and other users of electronic resources in libraries, Popoola (2008) made some suggestions about how libraries can successfully create awareness among users. He said library management should create faculty awareness about library holdings and other productions that can be accessed in the research libraries. It was also suggested that awareness of information products in the library should be created through programmed interactions with the researchers, regular user education, conducting users through the library at regular intervals, acknowledging users who use the library regularly by

rewarding them, and creating discussions with researchers in different divisions of the institutes. Electronic media like e-mail and WhatsApp were also recognised as tools that could be used to facilitate awareness among researchers and may likely contribute to continuous and increased use of e-resources by researchers.

Mishra (2011) identified some factors motivating researchers to appreciate e-resources, namely the popularity of electronic databases among researchers, the importance the researchers attached to them, and the remarkable benefits the researchers derive from the use of electronic information resources for their research. Prangya and Rabinda (2013) reported on a study conducted at the Indian Institute of Technology, Delhi, on the use of electronic journals. The findings revealed that the use of e-resources was on the increase. This was attributed to an increased awareness of the electronic databases among library users. The library users were reported to be consulting the electronic databases persistently due to easy accessibility at different places in the institute, including hostels and departments, instead of being forced to visit the library before they could access the services. In Nigeria, Aniedu and Uzuegbu (2014) revealed that apart from the availability of the desired information, other factors like a pleasant experience for users and their enhanced self-efficacy would promote the use of e-resources among researchers in research institutes and students at universities. In the study conducted by Egberongbe (2011) on the level of use of electronic resources at the University of Lagos, Nigeria, the results of the study showed that almost all the lecturers (90.6%) preferred to use electronic journals. Kpolovie and Awusaku (2016) did a study on the use of electronic information resources by lecturers in the River State of Nigeria. The results showed that the use of electronic information resources by the respondents for research and teaching at the university was high.

Generally, the awareness and use of electronic resources have been found to favourably assist researchers, students and other users to improve their level of productivity. Scholarly publication output of researchers is an issue that is usually and persistently given great attention among lecturers at universities and researchers in research institutes globally. It is so because the quality and quantity of publication output produced by researchers and lecturers signify the essential components of the measure of their productivity in the system, and consequently, publication output constitutes part of the factors that determine their responsibilities in the system. Hence, researchers will wish to have continuous improvement in their scholarly publication because of its importance to the growth of their career and their desire to contribute to knowledge in their various disciplines.

De Beer (2005) and Dulle (2008) focused on determining the characteristics that promote the use of open access as a medium to enhance scholarly publication among researchers. The outcome of the studies revealed that awareness of researchers about publication in open access channels influenced the researchers to choose publishing in an open access outlet. Attama (2013) associated the low level of scholarly publication output among academic staff with low awareness and non-use of library resources,

which included both electronic and print resources. Popoola and Haliso (2009) discovered from their study that academic staff awareness might contribute to their reliance on library resources like electronic library collections, which may also influence the quality of their scholarly publication output. Akpojotor (2016) recognised awareness of electronic information resources as among those contributing factors to increased intellectual information disseminated by researchers. The awareness of the Internet and its use by the faculty members were outstandingly recognised by Sukula (2008) to have modified users' interest to have comprehensive and concise information for their research.

In the study conducted by Chandra et al. (2014), using researchers at Arts and Science Colleges, most of the respondents expressed that they were aware of the presence of e-resources available in their library. This awareness contributed to the use of electronic resources by the respondents. Priyadharshini, Janakiraman, and Subramani (2015) also reported on their study conducted to find out the level of awareness and use of electronic resources among library users at the agricultural college and research institute in Madurai, Brazil. The report from the study confirmed that 80% of postgraduate students used e-resources frequently. The awareness strategies put in place by the library management were reported to have influenced the high use of electronic resources. Some of the electronic resources frequently used by the respondents included e-newspapers, CD-ROM databases and data archives, in that order.

Edem (2016) conducted a study on faculty awareness and utilisation of e-resources called The Essential Electronic Agricultural Library (TEEAL) for teaching and research by academic staff of the University of Calabar, Nigeria. The findings from the study revealed that 46.7% of the respondents used TEEAL. This was rated low, and one of the reasons reported for the low use of the e-resources was a lack of awareness of the database by the respondents. The various studies reviewed confirm that awareness is relevant to the use of electronic resources. This is because the creation of awareness noticeably stimulates the interest of researchers and causes them to use the information tool. Hence, the benefits derived from the use of e-resources continually impact positively in different areas of research activities, including the enhancement of the scholarly publication output of the researchers.

Methodology

The research design used for this study was the survey research design of the correctional type. This design was used because, according to Babie (2012), a survey research design is best for collecting data to describe a population that is too large to observe directly. Wyse and Reckase (2012) also explain that the research design is extensive and useful in describing the characteristics of a large population. The design has also been described as flexible and can be administered through many modes. The population of the study comprised researchers in 15 agricultural research institutes in Nigeria. The population of researchers in this study was 1 089, spread across all 15

NARIs. Some details about the institutes and the distribution of research officers in each institute are shown in table 1.

Table 1: Population of researchers in NARIs across Nigeria

S/N	Name of the Institutes	Geo-political Zone	Research Staff Strength
1.	Cocoa Research Institute of Nigeria (CRIN), Ibadan	South-West	68
2.	Institute of Agricultural Research and Training (IAR&T), Ibadan (Affiliated to Obafemi Awolowo University Ile-Ife)	South-West	65
3.	National Institute for Horticultural Research (NIHORT), Ibadan	South-West	72
4.	National Institute for Oceanography and Marine Research (NIOMR), Lagos	South-West	67
5.	Nigerian Stored Products Research Institute (NSPRI), Ilorin	North-Central	121
6.	National Cereal Research Institute (NCRI), Badegi	North-Central	62
7.	National Veterinary Research Institute of Nigeria (NVRI), Vom	North-Central	75
8.	National Institute for Freshwater Fisheries Research (NIFFR), New Bussa	North-Central	55
9.	National Animal Production Research Institute (NAPRI), Zaria	North-West	47
10.	National Extension and Research Liaison Services (NEARLS) (Affiliated to Ahmadu Bello University), Zaria	North-West	80
11.	Institute of Agriculture Research (IAR), Zaria (Affiliated to Ahmadu Bello University Zaria)	North-West	71
12.	Rubber Research Institute of Nigeria (RRIN), Benin	South-South	58
13.	National Institute for Oil Palm Research (NIFOR), Benin	South-South	67
14.	Lake Chad Research Institute (LCRI), Maiduguri	North-East	53
15.	National Root Crops Research Institute (NRCRI) Umudike	South-East	128
	TOTAL		1089

Sources: Websites of the institutes and personal contact with the institutes through administrative and research staff

Sampling Techniques and Sample Size

15 NARIs participated in the study, and a total enumeration method was used to cover all 1 089 researchers in all the institutes. The total enumeration method was adopted as it was perceived that a total view of the researchers in the NARIs should be considered

in the study. Because the researchers are in different research environments, they differ in discipline, cadre and types of management structure being used to administer the institutes. While all of them are coordinated by the ARCN, there are some among them who are affiliated with universities in Nigeria. This could make them have slight differences in administrative structures, despite the fact that they all conduct research in one area of agriculture or the other. Also, total enumeration was used because the population of the study (1 089 research scientists) was considered manageable to adopt the use of total enumeration since they could be reached for the administration of questionnaires without much hindrance. Horse (2018) also revealed that total enumeration sampling techniques help to eliminate possible errors during the sampling process and also enable the researcher to have a deeper insight into the population. The research instrument used for the study was a questionnaire that was developed by the researcher. All sections of the questionnaire are described under sections A–C:

Section A: Contained questions relating to the background information of researchers in NARIs. The background information included: the name of the institute, name of the department, age, educational qualifications, and years of working experience or job tenure.

Section B: It was designed to capture relevant information from researchers about their level of awareness of the e-resources listed in the instrument. The questionnaire had a four-point scale: Not very aware (NVA) = 1, Not Aware (NA) = 2, Fairly Aware (FA) = 3, and Very Aware (VA) = 4

Section C: Contained list of e-resources. The respondents were requested to give their frequency of the use of the listed e-resources in their research work. The response format was: daily (5), weekly (4), monthly (3), quarterly (2), and annually (1).

Data Analysis

Population of the Study and Pattern of their Response to the Questionnaire

The population of the study comprised 1 089 researchers in NARIs spread across all geo-political zones of Nigeria. Of the 1 089 questionnaires distributed, a total of 868 were returned. This gives a return rate of close to 80%. All the returned questionnaires were found valid to be used for the study; hence the valid percentage was 100%, as indicated in table 2.

Table 2: Names of research institutes that took part in the study and mode of researchers' response to the questionnaire

Institutes	Number Distributed	Frequency	%	Valid %	Cumulative %
Cocoa Research Institute (CRIN), Ibadan	68	52	6.0	6.0	6.0
Institute of Agricultural Research and Training (IAR&T) Ibadan (Affiliated to Obafemi Awolowo University), Ile-Ife, Nigeria.	65	52	6.0	6.0	12.0
National Institute for Horticulture (NIHORT), Ibadan	72	69	7.9	7.9	19.9
National Institute for Oceanography and Marine Research (NIOMR), Lagos	67	55	6.3	6.3	26.3
Nigerian Stored Products Research Institute (NSPRI), Ilorin	121	93	10.7	10.7	37.0
National Cereal Research Institute (NCRI), Badegi	62	51	5.9	5.9	42.9
National Veterinary Research Institute (NVRI), Vom	75	57	6.6	6.6	49.4
National Institute for Freshwater Research (NIFFR), New Bussa	55	31	3.6	3.6	53.0
National Animal Production Research Institute (NAPRI), Zaria. (Affiliated to Ahmadu Bello University), Zaria Nigeria.	47	35	4.0	4.0	57.0
National Extension and Research Liaison Services (NEARLS) (Affiliated to Ahmadu Bello University), Zaria	80	73	8.4	8.4	65.4
Institute of Agricultural Research (IAR), Zaria (Affiliated to Ahmadu Bello University Zaria)	71	65	7.5	7.5	72.9
Rubber Research Institute of Nigeria (RRIN), Benin	58	33	3.8	3.8	76.7
National Institute for Oil Palm Research (NIFOR), Benin	67	59	6.8	6.8	83.5
Lake Chad Research Institute (LCRI), Maiduguri	53	25	2.9	2.9	86.4
National Root Crop Research Institute (NRCRI), Umudike	128	118	13.6	13.6	100.0
Total	1089	868	100.0	100.0	100.0
Source: Field survey (2018)					

From table 2, the results revealed NRCRI as having the highest number of respondents with 118 representing (13.8%), followed by NSPRI with 93 respondents (10.7%), and National Extension Research Liaison Services (NEARLS) having the next highest number of respondents with 73 (8.4%). The last three institutes are RRIN 33 (3.8%) and NIFFR 35 (4.0), while LCRI has the least respondents of 25 (2.9%).

Research objective one: What is the level of awareness of e-resources among researchers in NARIs?

The responses given by researchers to indicate the extent of their awareness of electronic resources were analysed, and from the analysis, it can be concluded that there is a high level of awareness of electronic resources by researchers in NARIs.

Results in table 3 indicate the level of awareness of e-resources of the respondents. To determine the level of awareness of the respondents, a test norm was constructed for awareness of e-resources of the respondents. The scale is: a score of 1–39 implied low awareness of e-resources, 40–79 implied moderate awareness of e-resources, and 80–116 implied high awareness of e-resources. Since the overall mean score of awareness of e-resources of the respondents was = 89.35, SD =18.90, the mean fell between 80–116. It can be deduced that the respondents had a high awareness of e-resources. From table 3, it can also be deduced that among the major e-resources the respondents were aware of are AGORA, e-books, the Internet and electronic mail. AGRIS, Science Direct and JSTOR are among the e-resources the respondents had low awareness of.

Research objective two: What is the frequency of use of e-resources among researchers in NARIs?

The questionnaire determined the frequency of use of e-resources among researchers in NARIs, the opinion expressed by each respondent, the type of e-resources used and the frequency, which could be daily, weekly, monthly, and annually. The results can be observed in table 4.

Table 3: Level of awareness of e-resources among researchers in NARIs

Electronic Resources	NVA	NA	FA	VA	Mean	Std. Dev.
The Essential Electronic Agricultural Library (TEEAL)	80 (9.2%)	104(12.0%)	257(29.6%)	427(49.2%)	3.2107	.95154
Online Access to Research in the Environment (OARE)	91(10.5%)	171(19.7%)	299(34.4%)	307(35.4%)	2.9592	.98444
Access to Global Online Research in Agriculture (AGORA)	48(5.5%)	44(5.0%)	244(28.1%)	532(61.3%)	3.4550	.82360
Health Internetwork Access to Research Initiative (HINARI)	114(13.1%)	201(23.2%)	276(31.8%)	276(31.3%)	2.8181	1.02205
Agricultural Online Access (AGRICOLA)	107(12.3%)	196(22.6%)	332(38.2%)	233(26.8%)	2.8054	.97489
Agricultural Database (AGRIS)	101(11.6%)	226(26.1%)	301(34.7%)	240(27.6%)	2.7925	.98001
Science Direct	84(9.7%)	224(25.8%)	221(25.5%)	339(39.0%)	2.9951	1.01936
Elton B. Stephens Co (EBSCO)	183(21.0%)	397(45.8%)	156(18.0%)	132(15.2%)	2.2785	.97075
Journal Storage (JSTOR)	93(10.7%)	273(31.4%)	244(28.1%)	258(29.7%)	2.8075	1.00326
Electronic Journals (E-Journal)	34(3.9%)	127(14.6%)	263(30.3%)	444(51.2%)	3.3523	.82571
E-books	26(3.0%)	67(7.7%)	271(31.2%)	504(58.1%)	3.4947	1.02276
Online Catalogue	63(7.3%)	151(17.4%)	292(33.6%)	362(41.7%)	3.1199	.93039
Encyclopaedia	41(4.7%)	102(11.8%)	193(22.2%)	532(61.3%)	3.4323	.85531
Internet	12(1.4%)	41(4.7%)	110(12.7%)	705(81.2%)	3.7762	.557441
Electronic mail	19(2.2%)	65(7.5%)	132(15.2%)	652(75.1%)	3.7587	1.50512
E-newspapers/magazines	27(3.1%)	95(11.0%)	157(18.1%)	589(67.8%)	3.5893	.74903
CD-ROM Databases	59(6.8%)	153(17.6%)	199(22.9%)	457(52.6%)	3.2869	.94440
E-Dictionaries	36(4.1%)	124(14.4%)	220(25.3%)	488(56.2%)	3.4129	.83303
Theses/Dissertations	75(8.6%)	135(15.6%)	175(20.2%)	483(55.6%)	3.2968	.98686
Tutorials	87(10.0%)	148(17.0%)	215(24.8%)	418(48.2%)	3.1727	1.01359
Maps	64(7.4%)	121(14.0%)	241(27.7%)	442(50.9%)	3.2892	.92622
Conference papers/ monographs	65(7.5%)	131(15.1%)	190(21.9%)	482(55.5%)	3.2888	.96106
Video cassette	56(6.5%)	166(19.2%)	242(27.9%)	404(46.5%)	3.1680	.94119
Audio cassette	61(7.0%)	158(18.2%)	251(28.9%)	398(45.9%)	3.1505	.94818
Computer Software	43(5.0%)	134(15.4%)	244(28.1%)	447(51.5%)	3.2867	.88520
Blog	78(9.0%)	151(17.3%)	227(26.2%)	412(47.5%)	3.1407	.99477
Presentation slides	41(4.7%)	121(13.9%)	255(29.4%)	451(52.0%)	3.3624	1.64105
Online forum	51(5.9%)	147(16.9%)	257(29.6%)	413(47.6%)	3.2155	.91215
Qualitative data/Online interviews	82(9.4%)	166(19.1%)	274(31.6%)	346(39.9%)	3.0412	.98309

Source: Field survey (2018)

Table 4: Frequency of use of e-resources

Electronic Resources	Daily	Weekly	Monthly	Quarterly	Annually	Mean	Std. Dev
Online Databases e.g., AGORA etc.	117(13.5%)	262(30.1%)	216(24.9%)	183(21.1%)	90(10.4%)	2.8933	1.22310
Electronic Journals (E-Journal)	222(25.6%)	250(28.8%)	247(28.4%)	98(11.3%)	51(5.9%)	2.4480	1.57773
Electronic Books	167(19.2%)	245(28.2%)	231(26.6%)	122(14.1%)	105(11.9%)	2.7198	1.45176
Online Catalogue	88(10.1%)	164(18.9%)	173(19.9%)	263(30.4%)	180(20.7%)	3.2651	1.31325
Encyclopaedia	166(19.1%)	195(22.5%)	145(16.7%)	220(25.3%)	142(16.4%)	2.8932	1.39954
Internet	660(76.0%)	106(12.2%)	32(3.7%)	25(2.9%)	45(5.2%)	1.5000	1.06696
Electronic mail	627(72.2%)	122(14.1%)	52(6.0%)	22(2.5%)	45(5.2%)	1.5806	1.09521
www	578(66.6%)	116(13.4%)	67(7.7%)	58(6.7%)	49(5.6%)	1.7692	1.22757
E-newspapers/magazines	476(54.8%)	204(23.5%)	76(8.8%)	60(6.9%)	52(6.0%)	1.9610	1.43008
CD-ROM Databases	154(17.7%)	144(16.6%)	172(19.8%)	282(32.5%)	116(13.4%)	2.9152	1.36161
E-Dictionaries	376(43.3%)	177(20.4%)	138(15.9%)	104(12.0%)	73(8.4%)	2.3945	1.33990
Data archive	134(15.4%)	159(18.3%)	177(20.4%)	289(33.3%)	109(12.6%)	2.9250	1.32281
Theses/Dissertations	115(13.2%)	178(20.5%)	195(22.5%)	270(31.1%)	110(12.7%)	2.9576	1.27944
Tutorials	87(10.0%)	165(19.0%)	332(38.3%)	157(18.1%)	127(14.6%)	3.0985	1.26648
Maps	97(11.2%)	148(17.1%)	193(22.2%)	296(34.1%)	134(15.4%)	3.1199	1.29194
Conference papers/monographs	148(17.1%)	160(18.4%)	315(36.3%)	144(16.6%)	101(11.6%)	2.8549	1.30239
Microfilm reel	63(7.3%)	74(8.5%)	157(18.1%)	149(17.2%)	425(48.9%)	3.6139	1.30652
Microfiche	67(7.7%)	66(7.6%)	125(14.4%)	147(16.9%)	463(53.4%)	3.6824	1.34093
Video cassette	113(13.0%)	134(15.4%)	136(15.7%)	293(33.8%)	192(22.1%)	3.1933	1.45131
Audio cassette	145(16.7%)	125(14.4%)	148(17.1%)	96(11.1%)	353(40.7)	3.0906	1.69730
Computer Software	351(40.4%)	159(18.3%)	161(18.5%)	98(11.3%)	99(11.4%)	2.5676	1.38613
Blog	178(20.5%)	302(34.8%)	162(18.7%)	115(13.2%)	111(12.8%)	2.7693	1.39323
Presentation slides	133(15.3%)	183(21.1%)	340(39.1%)	133(15.3%)	79(9.1%)	2.7921	1.22079
Online forum	292(33.7%)	145(16.7%)	183(21.1%)	133(15.3%)	115(13.2%)	2.8690	1.35976
Qualitative data/Online interviews	93(10.7%)	106(12.2%)	319(36.8%)	167(19.2%)	183(21.1%)	3.3610	1.50210

Source: Field survey (2018)

To determine the level of use of e-resources by the researchers in NARIs, a test norm of the scale for the use of the e-resources was developed. The score of 1–39 indicated low use of e-resources by the respondents, while 40–79 indicated moderate use and 80–116 indicated high use of e-resources. Since the overall score of use of e-resources of the respondents was $\bar{x}=70.51$, $SD=21.8$, this score fell within the interval of 40–79. It, therefore, indicates that the respondents had moderate use of e-resources in NARIs. The table also shows that the Internet, e-mail, and microfilm reel are among the most used e-resources by the respondents, while newspapers/magazines are among the least used e-resources by the respondents.

Presentation of Hypotheses

Hypothesis 1 (Ho1): There is no significant relationship between scholarly publication output and awareness of e-resources among researchers in NARIs.

Table 5: Test of a significant relationship between scholarly publication output and awareness of e-resources of the respondents

Variables	No.	Mean	SD	r.	Sig P.
Scholarly publication outputs	868	30.54	18.1		
Awareness of e-resources	868	89.35	18.9	0.370	0.003

Table 5 shows the correlation between scholarly publication outputs of researchers in NARIs and their awareness of e-resources based on 868 respondents. The data shows the absolute value equal to 0.112 and is considered a positive correlation. This means that the two variables have a strong tendency to vary together. This indicates that there is a significant correlation or relationship between scholarly publication outputs of researchers in NARIs and their awareness of e-resources. From table 5, it can be seen that $r=0.58$ and $P>0.05$. Therefore, the finding is not consistent with the stated null hypothesis. This implies that awareness of e-resources causes or determines scholarly publication output; hence the hypothesis is rejected.

Hypothesis 2 Ho2: There is no significant relationship between scholarly publication output and the use of e-resources among researchers in NARIs.

Table 6: Test of significant relationship between scholarly publication outputs and use of e-resources by respondents

Variables	No	Mean	SD	r. correlation	Sig P
Scholarly publication outputs	868	30.54	18.1	0.81	.006
Use of e-resources	868	70.51	21.8		

Table 6 shows the correlation between scholarly publication outputs of researchers in NARIs and their use of e-resources based on 868 respondents. The data shows the absolute value equal to 0.068 and is considered a positive correlation. This means that the two variables have a strong tendency to vary together. This indicates that there is a significant relationship between the scholarly publication output of researchers in NARIs and their use of e-resources. From the table, we see $r = 0.068$ and $P > 0.05$; therefore, the findings are not consistent with the stated null hypothesis. This implies that the use of e-resources determines scholarly publication output; hence the hypothesis is rejected.

Table 7: Test of significant correlation between awareness and use of e-resources of the respondents

Variable	N	Mean	Std Deviation	r	Sig P
Awareness of electronic resources	868	89.35	18.9	0.44	0.004
Use of electronic resources	868	70.50	21.8		

To confirm if there is any relationship between awareness and use of e-resources among researchers in NARIs in Nigeria, the data in table 7 were examined. The interpretation revealed that there was a significant relationship between awareness of e-resources of researchers in NARIs in Nigeria and their use of e-resources. From the table we see $r = 0.44$ and $p < 0.05$. This implies that awareness of e-resources has a positive association with the use of e-resources by the respondents. Hence, the hypothesis is rejected.

Summary of Findings

The primary challenge of the study was to find out the level of awareness and use of e-resources and to determine if such awareness and use of these resources predict the scholarly publication output of researchers in NARIs in Nigeria. From the study, it was discovered that the respondents had a high awareness of electronic resources. The level of use of e-resources by the respondents was moderate. Also, the study showed that there was a significant relationship between awareness of e-resources and scholarly publication output of researchers in NARIs. The study also confirmed that there was a significant relationship between the use of e-resources and the scholarly publication output of the researchers. Finally, the study rejected the view that there was no significant relationship between awareness and the use of e-resources by researchers in NARIs.

Recommendations

Based on the findings, the following recommendations are made: It is recommended that the various library managements within NARIs should endeavour to sustain the level of awareness of e-resources among researchers in NARIs by continually deploying

new and relevant approaches. Some of the approaches may include the use of notice boards at the laboratory complex where the offices of most researchers are located. Sending e-mail and text messages to researchers can be incorporated into the methods to continuously create awareness among researchers. This is important because, from the study, it seemed that awareness related to enhancing the scholarly publication output of researchers.

The findings from the study show that the level of use of e-resources by the researchers in NARIs in Nigeria was moderate, despite the fact that the awareness of e-resources among the researchers was high. It is recommended that library management in libraries in NARIs should determine factors that hinder the use of the e-resources among researchers in NARIs and create a favourable environment that will continually sustain the use of electronic resources among researchers.

It is important that the use of e-resources among the researchers in NARIs is further enhanced because, from the study, the use of e-resources was discovered to have a significant relationship with the scholarly publication output of researchers in NARIs. To further promote the use of electronic resources among researchers in Agricultural Research Institutes in Nigeria, it is recommended that library management in various research institutes should continue to train and retrain library staff to acquire skills in the use of different e-resources databases available in the institute's library so that they will be able to adequately guide the researchers in the use of the databases. The library management of each agricultural research institute should have feedback processes to know how the researchers are feeling about the Internet services and the use of other electronic information resources in the library.

Conclusion

Electronic resources are widely used to provide accurate, comprehensive and timely information to scholars in different disciplines, including agricultural science (Ukpebor 2011). It is noticeable that the acquisition of different and relevant electronic databases is increasingly being incorporated by different libraries in Nigeria to meet the information need of their users. This is done with the intention of making adequate scholarly information available to scholars so as to stimulate more research and consequently increase scholarly publications. However, to achieve this in NARIs, factors that will lead to the effective use of electronic resources must be planned by the library management of each institute. The planning should include putting in place different innovative ways to create awareness with the researchers. This may promote frequent use of electronic resources, and consequently, it is expected that it will impact positively on the conduct of research and scholarly publication output of the researchers.

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