Use of selected Agricultural Electronic Based Resources among Postgraduate Agricultural Students in Southwest, Nigeria

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Abstract

Agricultural Electronic Based Resources (AEBR) is envisaged to provide tremendous information need of researchers given numbers to reach and quantum of information required. Past studies on AEBR have focused on uses and purposes to which it is deployed among scientists in agricultural research institutes but rarely focused on postgraduate agricultural students that are critical mass of budding scientists. Therefore, the use of selected AEBR among postgraduate agricultural students in Southwest, Nigeria was investigated in this study. A two- stage sampling procedure was used to select 158 postgraduates from across federal, state and private universities in the study area. Questionnaires were used to collect data on respondents' socioeconomic characteristics, AEBR's awareness and use, purpose of use and constraints to use of AEBR. Data were analysed using descriptive and inferential statistics at $\alpha_{0.05}$. Respondents had a mean age of 29.8±5 years, mostly male (56.3%), with Bachelors' Degree (68.4%). Sources of awareness of AEBR were Internet (0.88±0.32), seminar (0.82±0.38) and library (0.55±0.49) and were mostly aware of AGORA (0.75±0.43), TEEAL (0.62±0.48) and ARDI (0.55±0.49). Improved information literacy (1.50±0.65) and searching for research ideas and topics (1.46±0.62) ranked most as purposes that AEBR served. However, use was constrained by inadequate electricity (1.68±0.55), high cost of ICT facilities (1.53±0.67) and poor mobile network service (1.53±0.67). The constraints faced by respondents positively correlated with their use of AEBR resources (r=0.289). It is recommended that effort be made by the government to improve on infrastructural deficits for better use of the AEBR by these budding researchers.

Keywords: Agricultural students, AGORA, ARDI, ICT facilities, TEEAL

Introduction

In every human society, communication is important because it is a means through which man interacts and makes meaningful relationships. Hence, communication among professional groups, friends and associates gives room for people to define their collective interests, identities and common goals (Yahaya, 2002; Yahaya, 2008; Sokoya, *et al.,* 2012). Also, individuals and professionals across disciplines establish connections with one another for diverse reasons. These include exchange of ideas or information, mentoring and career development. With the introduction of information technologies, networking among different groups have been made easier through internet connectivity and this is being exploited by people in all spheres of life, including agriculture (Olajide, 2011; Fawole and Olajide, 2012; Sokoya, *et al*., 2012).

Agricultural Electronic Based Resources (AEBR) are established by different organizations and bodies with the primary intent of making people discover, read and share news, information and contents to improve agricultural methods as well as support the human need for social interaction with technology to improve food security. There are a number of agricultural electronic based resources including Research4Life (R4L), the collective name for four programmes namely; HINARI (focusing on health), AGORA (focusing on agriculture), OARE (focusing on environment), and ARDI (focusing on applied science and technology). Together, Research4Life provides developing countries with free or low-cost access to academic and professional peer-reviewed contents online. They are coordinated by UN-agencies, international organizations, and private partners.

Other AEBR include EIN News, SPORE, Farm Radio International, Farming Matters Magazine, Farm Voice Radio, Farm Industry News and The Essential Electronic Agricultural Library (TEEAL). Most of these e-resources provide free online access to major scientific and technical journals to institutions; improve the quality and effectiveness of agricultural research, education and training in low-income countries, and in turn, improve food security in developing countries across the world.

With the advent of modern technology, especially the Information Communication Technology (ICT), information exchange between critical stakeholders in agricultural development and advancement can no longer rely on old ICT as found in town criers, posters, radio, newspapers and television, and even immobile and traditional libraries (Fawole and Olajide, 2012). Also, different forums; seminars, workshops, and annual conferences used by researchers in research dissemination have either become obsolete or cannot cope with the tremendous information need of stakeholders both in terms of numbers to reach and quantum of information required.

The emergence of many virtual libraries as found in OARE, HINARI and TEEAL provided a feasible solution to this challenge.

Since the past decade, these media have become a mainstream cultural phenomenon (Boyd and Elison, 2007), and agricultural researchers have caught a glimpse of the tremendous role these forums can play in facilitating dissemination of agricultural research findings and exchange of information.

Past studies (Olajide and Amusat 2012; Adetunji, 2013) provided evidence on the use of the electronic based media among scientists in the agricultural industry and the purpose for which they use the media.

However, these studies have isolated postgraduate agricultural students in their focus. The postgraduate students are critical mass of budding scientists that engage in research to keep abreast of information and developments in their areas of specialization.

They are actively involved in research engagements that are tailored toward improving human, animal and plant species as well as evolving technologies and sustaining best practices necessary to meet production in the agricultural sector. This makes it imperative to ascertain the level of use of selected agricultural electronic based resources among postgraduate agricultural students in southwest of Nigeria; being a critical hub of research institutes and institutions in the country. It is against this background that this study provided answers to the following research questions; (i) What are the socio-economic characteristics of the postgraduate agricultural students in the

study area? (ii) How do the students get to know about the different agricultural electronic based resources? (iii) What are the agricultural electronic based resources the agricultural students are aware of? (iv) What is the level of use of the selected agricultural electronic based resources by the students? (v) What are the purposes for which the students use the agricultural electronic based resources in their career and professional development? (vi) What are the constraints to the use of the agricultural electronic based resources?

Materials and Methods

The study was carried out in Southwest Nigeria. Southwest Nigeria comprises of Lagos, Ogun, Oyo, Osun, Ondo and Ekiti States with a reasonable preponderance of private and government (federal and state) owned universities (NUC, 2015). Most of these universities in their population also run agriculture-based courses ranging from Agronomy, Fisheries and Aquaculture, Wildlife and Ecotourism Management, Animal Science, Agricultural Economics and Agricultural Extension and Rural Development. The population of the study consists of postgraduate agricultural students mainly in universities across southwest Nigeria.

A two-stage sampling procedure was used to select respondents for the study. In the first stage, universities were stratified into federal, state and private universities. From four federal and three private universities purposively selected based on availability of postgraduate programmes and faculty of agriculture, 50 percent were randomly selected from each stratum resulting in two federal and two private universities. For the state university, 30 percent of the nine state universities were selected randomly which

resulted in three state universities. The selected universities across the strata were University of Ibadan and Federal University of Agriculture, Abeokuta (for federal), Ladoke Akintola University of Technology (LAUTECH), Olabisi Onabanjo University (OOU), University of Osun State (state university) and BABCOCK University and Joseph Ayo Babalola University (JABU) for private universities. In the second stage, proportionate sampling was used to randomly select 158 students from a total population of 2,305 postgraduate students from across institutions and areas of specialization.

The dependent variable of this study (use of AEBR) was measured with a 9-item scale containing a list of AEBR and respondents were asked to indicate their level of use of these resources with response options of never, occasionally and regularly and scores of 0, 1 and 2 were assigned, respectively. Mean score for use of each of the resource was determined and all AEBR were ranked using means score with highest and lowest mean scores ranked first and least, respectively. Data were analysed using descriptive (frequencies, percentages and mean) and inferential (Pearson product moment correlation) statistics at $\alpha_{0.05}$.

Results

Respondents' socio-economic characteristics
Respondents were aged between 21 and 44 years with mean age at 29.8±5 years but a little over half (51.9%) of the respondents were between the ages of 26 and 30 years, as shown in Table 1. Furthermore, results in Table 1 reveal that 56.3% of the respondents were male, while 43.7% were female. On educational attainment of the respondents, expectedly, 68.4% had their Bachelor degree, while 31.6% had Master's degree. This is

further corroborated by the fact that 72.8 % of the respondents were on Masters Degree programme, while 9.5% and 17.7 were on

Table 1: Distribution of respondents by their socioeconomic characteristics (N=158)

Variable	Frequency (%)
Age	
21-25	24 (15.2)
26-30	82(51.9)
31-35	32(20.3)
36-40	14(8.9)
41-45	6(3.8)
Sex	
Male	99 (56.3)
Female	69(43.7)
Educational qualification	108(68.4)
Bachelors	40(31.6)
Masters	
Degree in view	
Master Degree	115(72.8)
Masters of Philosophy	15(9.5)
Doctoral Degree	28(17.7)
Means of Access to internet	43(27.2)
Internet service providers	23(14.6)
Cyber café	34(21.5)
Internet modem	58(36.7)
Mobile phones	
Areas of specialization	
Agricultural Extension	27(16.6)
Agricultural Economics	34(21.5)
Agronomy	13(8.2)
Plant Protection	15(9.5)
Forestry	13(8.2)
Animal Science	31(19.5)
Fisheries	13(8.3)
Agricultural Engineering	7(3.8)
Wildlife and Ecotourism	8(4.4)

Source: Field Survey, 2014
Figures in parentheses are percentages

Masters of Philosophy and Doctorate degree programmes, respectively. It is evident from the results in Table 1 that most of the postgraduate students accessed internet through their mobile phone (36.7%), while 27.2%, 21.5% and 14.6% had access to the internet via several internet service providers, internet modems and cyber café, respectively. On respondents' specialization, Table 1 indicates that a higher proportion of the students were in Agricultural.

Economics (21.5%), Animal Science (19.5%), and Agricultural Extension (16.6%) than Crop Protection (9.5%) and Forestry (8.2%).

Respondents' sources of awareness
Table 2 reveals that the Internet (0.88±0.32), seminar (0.82±0.38) and library (0.55±0.49) ranked 1st, 2nd and 3rd, respectively, while newspaper ((0.31±0.46) was ranked the least (8th).

Table 2: Frequency distribution of respondent's source of information on AEBR

Sources of awareness	Yes (%)	No (%)	Mean± SD	Rank
Internet	88.0	12.0	0.88±0.32	1st
Friends	53.2	46.8	0.53±0.50	4th
Seminars	82.3	17.7	0.82±0.38	2nd
Colleagues	47.5	52.5	0.47±0.50	5th
Library	55.1	44.9	0.55±0.49	3rd
Newspaper	31.6	68.4	0.31±0.46	8th
Radio	39.2	60.8	0.39±0.48	7th
Television	40.5	59.5	0.40±0.49	6th

Source: Field survey, 2014
SD = Standard Deviation

Respondents' awareness of agricultural electronic based resources
The results in Table 3 reveal that while three-quarter (75.3%) of the respondents were aware of Access to Global Online Research in Agriculture (AGORA), most of the respondents (62.0%) were aware of The Essential Electronic

Table 3: Distribution of respondents based on awareness of AEBR

Agricultural Electronic Based Media	Aware	Not aware	Mean	SD	Rank
Access to Global Online Research in Agriculture (AGORA)	75.3	24.7	0.75	0.43	1st
Access to Research for Development and Innovation (ARDI)	55.1	44.9	0.55	0.49	3rd
EINnews	29.1	70.9	0.29	0.45	9th
SPORE Magazine	43.7	56.3	0.43	0.49	4th
Farm Radio International	36.1	63.9	0.36	0.48	8th
Farm Matter Magazine	43.7	56.3	0.43	0.49	4th
The Essential Electronic Agricultural Library (TEEAL)	62.0	38	0.62	0.48	2nd
Farm Voice Radio	43.7	56.3	0.43	0.49	4th
Farm Industry News	75.3	62	0.37	0.48	7th

Source: Field survey, 2014

Agricultural Library (TEEAL) and more than half (55.1%) knew about Access to Research for Development and Innovation (ARDI). In another perspective and perhaps expectedly, AGORA (0.75±0.43), TEEAL (0.62±0.48) and ARDI (0.55±0.49) ranked 1st, 2nd and 3rd, respectively.

Respondents' use of the selected agricultural electronic based resources
Available information in Table 4 indicates that postgraduate students' use of AGORA (0.75±0.43), TEEAL (0.62±0.48) and ARDI (0.55±0.49) ranked 1st, 2nd and 3rd respectively.

Purpose of use of the selected agricultural electronic based resources
Data in Table 5 shows that improving information literacy (1.50±0.65), searching for research ideas and topics (1.46±0.62), research and study scholarships (1.33±0.76) and keeping abreast of current topical issues in respondents' area of specialization (1.08±0.74) were ranked 1st, 2nd, 3rd and 4th, respectively.

Constraints to use of selected agricultural electronic based resources by respondents
Inadequate electricity (1.68±0.55), high cost of ICT facilities (1.53±0.67) and poor mobile

Table 4: Distribution of respondents based on use of AEBR

Agricultural Electronic Based Media	Never	Occasionally	Regularly	Mean±SD	Rank
Access to Global Online Research in Agriculture (AGORA)	19.6	50	30.4	0.75±0.43	1st
Access to Research for Development and Innovation (ARDI)	32.9	47.5	19.6	0.55±0.49	3rd
EIN news	52.5	32.3	15.2	0.29±0.45	9th
SPORE Magazine	43.7	43	13.3	0.43±0.49	4th
Farm Radio International	43	44.3	12.7	0.36±0.48	8th
Farm Matter Magazine	41.1	47.5	11.4	0.43±0.49	4th
The Essential Electronic Agricultural Library (TEEAL)	38	41.1	20.9	0.62±0.48	2nd
Farm Voice Radio	41.8	43.0	15.2	0.43±0.49	4th
Farm Industry News	46.2	41.1	12.7	0.37±0.48	7th

Table 5: Distribution of respondents based on purpose of use of AEBR

Purposes	Never	Occasionally	Always	Mean± SD	Rank
Research and study scholarships	17.7	31.0	51.3	1.33±0.76	3rd
Searching for research ideas and topics	7.0	39.9	53.2	1.46±0.62	2nd
Sharing information with colleagues	26.6	39.9	33.5	1.06±0.77	5th
To stay abreast of current topical issues in my area of specialization	24.1	43.7	32.3	1.08±0.74	4th
Asking questions from senior professional colleagues anywhere in the world	43	40.5	16.5	0.73±0.72	10th
Establishing professional relationship with other colleagues	36.7	39.2	24.1	0.87±0.77	7th
Sharing knowledge with others	30.4	37.3	32.3	1.01±0.79	6th
Sharing photos, videos and slides	51.9	31.6	16.5	0.64±0.74	9th
Reaching out to people outside regular circle to gain valuable ideas and feedbacks	33.5	47.5	19.0	0.85±0.71	8th
Improve information literacy	8.9	31.6	59.5	1.50±0.65	1st

Table 6: Distribution of respondents based on constraints to use of AEBR

Constraints	Not a constraint	Moderate	Severe	Mean± SD	Rank
Inadequate electricity	4.4	22.2	73.4	1.68±0.55	1st
High cost of ICT facilities	10.1	25.9	63.9	1.53±0.67	2nd
Lack of technical know-how	28.5	42.4	29.1	1.00±0.76	5th
Complexity of the selected tools	26.6	50.6	22.8	096±0.70	6th
High subscription tariffs	13.9	25.3	60.8	1.46±0.72	4th
Low computer literacy	55.7	31	13.3	0.57±0.71	8th
Poor sensitization on ICT	33.5	46.8	19.6	0.86±0.71	7th
Poor mobile network	9.5	27.2	63.3	1.53±0.66	2nd

network service (1.53±0.67) were severe constraints to effective deployment and use of AEBR for several purposes.

Correlation analysis of constraints faced by respondents, purposes AEBR serve and its use

Constraints faced by respondents was positively correlated with their use of AEBR resources (r=0.289) (Table 7). In similar vein, purposes to which respondents put AEBR resources significantly correlated with their use of the resources (r=0.350).

Table 7: Correlation of respondents' constraints and use of agricultural electronic based resources

Variable	r-value	p-value	Remark
Constraints	0.289	0.000	Significant
Purposes	0.350	0.000	Significant

Discussion

Majority of the postgraduate students in agriculture were young and are likely to be able to exploit all avenues, including electronic based resources to enhance their research work and career. Also, age is a variable which has been found to correlate with the use of computer electronic resources (Laguna and Babcock, 1997; Fawole and Olajide, 2012). In their respective studies, significant differences were established between adults and youths on the completion of computer-based tasks and use of information communication resources.

There were more male agricultural postgraduate students than female. This perhaps influenced career choices even in academics as females tend more towards specialization in Arts and Humanities, while males seek careers in science-related disciplines, including agriculture. Also, more respondents in the Masters programme participated in the study than those in the Doctor of Philosophy programme, perhaps, due to sampling strategy or more explicitly as a result of the fact that more students are enrolled in various Masters programmes than the Doctoral programmes. The internet has a wide base that allows access to an enormous range of research information either as full publications, reports, summaries or abstracts (Penny, 2006). Result arising from investigation into how the internet was accessed implies that use of mobile phones is the most common access to internet probably because it is readily available and comes at lower cost especially when compared with use of cyber café. It is also instructive to note that none of the students affirmed that their institutions provided access to internet. This is not to say that some of the institutions do not provide internet access, however, due to infrastructural challenges as

manifested in this study, such services are often epileptic. The area of specialization variable paints a picture of a fair representation of the population of respondents based on area of specialisation as the sample for this study was drawn proportionately.

The probable reason for the sources of awareness (Internet, seminar and library) implicated in this study could be that they are cheaper sources and carry a vast array of information as posited by (Jagboro, 2003). This tends to represent the real picture of current situations as seminars are regular features of postgraduate studies in Nigerian Universities and students learn a lot from seminar presentations. Also, with emergence of the Global System of Mobile (GSM) communication and its liberalization, internet access comes handy and accessible to all sectors and segments of the Nigerian society including, academics. This is in line with Akporido (2005) who affirmed that students at Delta State University, Nigeria use the internet mostly for research. Though traditional library system is becoming less fanciful, with the advent of digitalised library where AEBR resources abound, it still serves as a potent source of valuable information to the students' population.

Result on awareness justifies the recent awareness campaign on these online agricultural information and research output resources. It must be noted that in recent years awareness creation on these resources was mounted for popularisation of all of these agriculture and environment based electronic based resources. It equally bears eloquent testimony to the fact that the targets of the awareness campaign (postgraduate students, academia and researchers) were reached and mobilized and the effort impacted positively on the targets. The awareness creation of these resources tends to inform the *apriori*

expectation that these resources are likely to be intensely used by the target of this study. This is in line with the studies of Oduwole and Akpati (2003) and Jagboro\(2003) that established the use of these resources in Nigeria, especially among professionals in research institute and higher institutions alike (Olajide and Amuzat, 2012).

It must be emphasised here that while AEBR like TEEAL, AGORA and ARDI to which this study's targets seem to subscribe to (in terms of awareness and use) could serve all purposes identified by this work, it is expedient that purposes of information literacy, research and study scholarship might have been sought by postgraduate students from other electronic resources like Spores, Farm Matters and Farm Industry News. This implies that though not much publicity was around these AEBRs (Spores, Farm Matters and Farm Industry News), the purposes they could serve was not lost on students hence this speculated patronage. The picture here is similar to Olatokunbo and Asiru's (2001) position that their targets were motivated to use electronic information sources for their research project as these sources provide quick access to information.

The findings on constraints to the use of AEBR validates the position of Fawole and Olajide (2012) and Fatoki (2004) who established that high cost of IT equipment and poor telecommunication infrastructure were problems associated with use of ICT resources in universities. Also, Olatokunbo and Asiru (2001) found slow internet connectivity and incessant power outage as major constraints to use of ICT for education in Nigeria. It is instructive to note that despite wide coverage by most mobile telephone service providers who have in recent years ventured into internet service provision, little

or no effort were made to improve quality of services they provide.

The correlational analysis between constraints and use implies that to a very large extent, constraints faced by the respondents could have limited their use of these resources. It further suggests that with adequate ICT infrastructure, internet connectivity and un-interrupted power supply, the students could have put these resources to better use. The obvious frustrations and manpower inefficiency occasioned by phobia of energy disruption and lack of certainty of unencumbered internet access are some of the unfriendly contexts that confront academia in developing countries like Nigeria. In a similar vein, purposes these students use the AEBR for implies that extent of use of the AEBR resources by the respondents is dependent on various uses or purposes AEBR serve. This implies that baring restriction and limitation of IT resources and various infrastructural challenges students are confronted with, it is likely that they could have put the AEBR to maximum and best uses possible.

Conclusion and recommendations

Most postgraduate students were male, young, with various Bachelor's Degrees and were sensitized about AEBR through Internet and seminars. They were mainly aware of and use AEBR such as AGORA, TEEAL and ARDI. These resources were accessed for purposes ranging from information literacy, searching for research and idea and topics to seeking for scholarship and being abreast of trending topical issues in their various disciplines. However, their use of the AEBR was hampered by inadequate electricity, high cost of ICT facilities and poor mobile network service. Constraints and purposes for which they

intended to deploy the resources accounted for extent of use of AEBR. It is recommended that more awareness creation should be mounted by institutions (universities and promoters of these AEBR resources) on other potentially useful AEBR. Effort should also be made by the government to improve on infrastructural deficits for better use of the AEBR for researchers and budding researchers alike.

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