Assessment of Internet Usage by Extension Workers in Accessing Relevant Messages for Their Clientele: A Case Study of Benue State, Nigeria

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Abstract*: This study assessed the usage of internet by extension agents in accessing relevant messages for their clientele in Benue State, Nigeria. All the extension agents in the state (40) were the respondents for the study. Primary data were used, collected using a structured questionnaire Data were analyzed using descriptive and inferential statistics.Research findings revealed the mean age of respondents as 51.45 years, 95.0% of respondents were married and 98% had formal education. The mean household size was about 7 members, mean annual income was ₦1,304,350 and mean working experience was 27.37 years. The findings further revealed that more than 50% of the respondents had a moderate level of use of internet. The respondents had low level of internet proficiency, as the mean value of their proficiency for internet usage was below the medium scale. The result of factor analysis revealed that three categories of factor militated against the usage of internet, and they were infrastructural, socioeconomic and government factors. Age (W=3.172) and income (W=3.523) significantly affected respondents' level of use of internet. It was therefore recommended that extension agencies create awareness and organize in-service training for the staff periodically on better skill acquisition in basic computer appreciation and innovative ICT bases system and regular upgrading of internet skills in order to improve their proficiency level in the use of internet, and it is necessary that access to internet facilities be provided with other supporting infrastructure.*
Key words*: Assessment, Internet usage, Extension workers, Relevant messages*

I.   Introduction

Over the years, agricultural extension has been at the fore-front in the delivery of adequate information to farmers for increased productivity (Agbamu, 2007). The main purpose of agricultural extension activities is to communicate relevant and useful information to the end users, to persuade them to adopt innovations that will eventually lead to increase in agricultural production (Okunade and Oladosu, 2006). In most developing countries such as Nigeria, subsistence or traditional agriculture dominates the economy and for national progress to occur, change in agriculture is essential. The change is needed not only to increase production, but to liberate households from poverty (Anaeto, 2005). An extension worker helps farmers increase the productivity of their farms and improve their living standards (Asiabaka, 2002). According to Asiabaka (2002), an extension worker has many roles. He is an adviser, a technician and a middleman operating between agricultural research institutions and the farm families. He is a change agent, consultant and advocate helping farmers to identify their problems and find their own solution. He works for the creation of community harmony essential for group projects. He is a manager, planning and organizing his work and that of his clients.

Extension organizations have been concerned with what should be the appropriate means and approaches in getting the right agricultural information to the end-users (farmers). In recent times however, there has been revolution with regards to Information and Communication Technology (ICT) in agriculture and particularly, extension service delivery in Nigeria. This revolution is an intervention with the potential to ensure that knowledge and information on important agricultural technologies, methods and practices are put into right use by farmers. The use of ICT provides an important platform for actualizing this. ICTs consist of various collections of resources and technical tools that are used for connecting, spreading, storing and managing information (Pigato, 2004).

Information specialists and extension agents have the primary responsibility of disseminating agricultural information to user population. It is therefore necessary for extension agents to have access to agricultural information which they are expected to share with their clients (farmers). The internet is one of the sources of

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information which the extension agents can explore and use. There is unquantifiable information available on the internet. The extension agents will need to have access to the internet, and also possess some level of proficiency when it comes to the use of internet to access agricultural information. It is in this light that this study was carried out, to assess the usage of the internet by extension agents in Benue State, Nigeria to access agricultural information for their clients. The specific objectives of the study were to:

i. describe the socio economic characteristics of the respondents in the study area;
ii determine the level of usage of internet by the respondents in the study area;
iii. determinethe proficiency of respondents in the use of internet in the study area; and
iv. identify the constraints or challenges to effective internet usage by the respondents in the study area.

Based on the specific objectives, the following null hypothesis was stated and tested:

H_0: The socio-economic characteristics of extension agents do not have any significant effect on their level of use of the internet.

II. Methodology

The Study Area

The study was carried out in Benue State, one of the North-central states in Nigeria created in 1976. The State lies between latitudes $6^0$25'N and $8^0$8'N and longitudes $7^0$47'E and 10^0E'. It is surrounded by five states, namely Nassarawa to the north, Taraba to the northeast, Cross River to the south, Enugu to the Southwest and Kogi to the West. There is also a short international boundary between the state and the Republic of Cameroun along Nigeria's southeast border. Benue State covers a land mass of 2,753,077 Km^2, and has a population of 4,253,614 persons in 2006, projected to 5,741, 800 persons in 2016 (Citypopulation, 2017).

Benue State is referred to as the food basket of the Nigerian nation because of its diverse rich agricultural produce which include yams, rice, beans, cassava, soyabeans, benniseed , maize, sorghum, millet, tomatoes. Livestock such as poultry, goats, sheep, pigs and cattle are also reared. Others include cocoyam, sweet potatoes, millet, beans, cassava, and a wide range of other crops like groundnuts, ginger and sugar cane. It is the only notable producer of soyabeans in the country. Tree crops like oil palm, cashew, mango, coconut, bananas and citrus also grow very well in the state (Benue Agricultural and Rural Development Authority (BNARDA), 2018).

Population of the Study

The target population for this research work is extension agents in Benue state, Nigeria. The entire population was studied, which consists of 40 extension agents in the three agro-development zones in the state. The population was studied because the number of extension agents in the study area is low.

Data Collection Procedure

Primary data were used for this study and collected using a well-structured questionnaire which consists of five sections. Section A covered information on the socioeconomic characteristics of the respondents; Section B covered information on the level of usage of internet by the respondents; Section C covered information on the extent of respondents experience and proficiency in the use of internet in the study area; while Section E covered information on the constraints or challenges to effective internet usage by the respondents in the study area.

Data Analysis Techniques

The data collected wereanalyzed using descriptive and inferential statistics. Objectives 1-3 were achieved using descriptive statistics such as percentages, mean, and Likert-type scale. Objective 4 was achieved using factor analysis. The hypothesis was tested using logistic regression analysis. The logistic regression model is a binary technique which can be used to predict the effect of the socioeconomic characteristics of respondents on their level of use of internet. The logistic regression model is stated as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + U_i$$

Where:
Y = Probability of level of use of internet (1= high, 0= low)
β_0= constant term
β (1,2……6) vector of the parameter to be estimated
X_1 = Age of respondents (years)
X_2 = Marital Status (1= married, 0= single)
X_3= Annual Income (Naira)
X_4 = Years of formal education

X_5 = House hold size (Persons)
X_6 = Working experience (years)
U_1 = independent distributed error term

Measurement of Variables
Dependent Variable
      The dependent variable for this study was the level of use of internet, measured using a Likert-type scale ranging from low to high. Respondents that indicated their level of use of internet to be either "moderate" or "high" were classified as having a high level of use of internet, while those that indicated "low" will be classified as having a low level of use of internet usage.

Independent Variables
The independent variables for this research were the socioeconomic characteristics of the respondents, measured as follows:
1. Age: Age was measured by indicating the respondent's chronological age in years.
2. Sex: Sex was measured by indicating the respondents' gender in terms of male and   female coded as male= 1 and female= 0
3. Marital Status: This was coded as married=1, single=0
4. Level of Education: This was measured by indicating the respondents' highest level of education: Non-formal education, primary school education, post primary education and tertiary school education.
5. Household size: Family size was measured as the number of persons living in the house of the respondents at the time of interview
6. Working Experience: This was measured by indicating the number of years the respondent has been working.
7. Annual Income: The money that the respondents make from the extension agency annually, in naira.

III.   Results And Discussion
Socio-economic characteristics of the respondents
      The findings on the socio-economic characteristics of the respondents is presented in Table 1. It was found that the mean age of respondents was 51.45 years. Majority (50%) are aged between 51 and 60 years. This trend may have significant implication for internet usage, since the elderly might be less interested in using hi-tech communication devices and prefer oral and printed information channels which are less efficient (Adegbola and Bamishaye, 2013). Davish, Mahesh and Sushil (2017) found that the age of individuals affects their mental attitude toward new ideas and hence influence the use of internet in several ways. An overwhelming number (62.50%) of the extension agents were females, indicating that more females are involved in extension work in the study area. The result further indicated that majority (95.0%) of the respondents were married.

      Research findings also show that 10.0% of the extension agents had secondary education, considerable proportion (85.50%) had tertiary education, and 2.50% had Postgraduate Diploma(PGD) as their highest educational level attained. This is an indication that many of the respondents are educated, andthat could contribute to their comprehension of the internet thereby increasing the likelihood of Internet use in the study area. This finding corroborates Koyenikan, Koyenikan and Ilekendi(2012), who opined that the use of the internet is influenced by the level of education of extension agents. Research further shows that majority (85.0%) of the respondents had household size in the range of 5-9. This implies that the extension agents have family responsibilities which might negatively affect their ability to purchase or use the internet, considering the cost involved.

      On their income, the respondents earned an average of ₦1,304,350 per annum. Majority (32.50%) earn below 1 million naira annually. Their income level shows that they were high- earning civil servants which may improve their standard of living and performance at work and also afford them the ease with which they can access the internet. Fund is an important factor in the use of internet because money is required in subscribing for internet where it is not readily available in the offices. Even when internet is available, there are some fees that must be paid to access some information on the internet and this is a function of money. Therefore, the amount the respondents earn can affect how they use the internet.

      With reference to working experience, it was found that the average years of experience of the respondents was 27.37 years. This implies that many of the extension agents are relatively established in their profession and they could be more confident at trying a new approach in their profession and also indication that they were well experienced in their jobs and this gives them advantage of appreciating the role of internet.

TABLE 1: Socio-economic Characteristics of Respondents(n=40)

Socio-economic Characteristic	Frequency	Percentage	Mean
Age (Years)			51.45
≤ 40	4	10.00	
41 – 50	14	35.00	
51 – 60	20	50.00	
> 60	2	5.00	
Sex			
Female	25	62.50	
Male	15	37.50	
Marital Status			
Married	38	95.00	
Single	2	5.00	
Education			
Primary	0	0.00	
Secondary	4	10.00	
Tertiary	35	87.50	
PGD	1	2.50	
Household Size (Persons)			≈7
≤ 4	3	7.50	
5 – 9	34	85.00	
10 – 14	3	7.50	
> 14	0	0.00	
Income (₦)			
≤ 1,000,000	13	32.50	1,304,350
1,000,001 – 1,300,000	8	20.00	
1,300,001 – 1,500,000	7	17.50	
> 1,500,000	12	30.00	
Experience (Years)			27.37
≤ 10	1	2.63	
11 – 20	3	7.89	
21 – 30	25	65.79	
> 30	9	23.68	

Level of Use of Internet by the Respondents in the Study Area

The result on the level of use of the internet by the respondents is presented in Table 2.

The mean values of most of the comments on the usage of internet by the respondents were below the mean value of the Likert scale (2.0). Only usage of the internet to communicate with colleagues on recent innovations ($\bar{x}$ = 2.13) and use of the internet to source for agricultural news ($\bar{x}$ = 2.20) were above the mean value of the scale. It is an indication that the usage of internet by the respondents was low. Despite a large number of agricultural information on the internet and the opportunity of accessing the internet via phone, only a few of the extension agents uses it for the purpose of sourcing and dissemination of innovation. Meera, Jhamtani and Rao (2004) asserted that internet cafes are increasing in numbers, but not many extension agents and farmers use it to search for information. Koyenikan, Koyenikan and Ilekendi(2012) reported that the use of internet was not popular among extension agents in performing their job.

Table 2:Distribution of Respondent according to Level of use of   Internet

S/No	Statements	Level of use Low	Moderate	High	Mean
1.	I often use internet to source for innovations	21(52.5)	11(27.5)	8(20.0)	1.93
2.	I deliberately restricted my internet usage due to previously excessive use	29(72.5)	11(27.5)	0(0.0)	1.28
3.	I always lose track of time when am using the internet	31(77.5)	9(22.5)	0(0.0)	1.23
4.	The use of internet enables me in communicating with an extension agent in another country on improved technologies	25(62.5)	12(30.0)	3(7.5)	1.45
5.	I use internet in communicating with colleagues on recent innovation	10(25.0)	15(37.5)	15(37.5)	2.13
6.	I frequently use internet in sourcing for agricultural news	6(15.0)	20(50.0)	14(35.0)	2.20
7.	Through the of internet am able to source for research-based information	10(25.0)	25(62.5)	5(12.5)	1.88
8.	I use internet to send videos and images of improved technologies to other extension agents and farmers	17(42.5)	13(32.5)	10(25.0)	1.83
9.	I always use internet to disseminate ideas to farmers organization	26(65.0)	14(35)	0(0.0)	1.35
10.	I use internet in sourcing for information while preparing for presentation	15(37.5)	22(55.0)	3(7.5)	1.70

Figures in parenthesis are percentages

Respondents' Internet Proficiency Level

The proficiency level of respondents on the use of the internet is presented in Table 3.Extension agents mean rating scores in internet proficiency level in all the 14 items ranged between 1.13 and 1.88. The mean rating in each of the items was lower than 2.00, the mid of the scale. The results show that extension agents' internet proficiency level was generally low. For instance, mastery of computer-based packages (e.g. Adobe, Web Page Design, File Structure, IPSO and Access) had mean of 1.13, the mean of use of computer packages like Auto-CAD in making sketches, drawing and illustrations was 1.15.Knowledge of Computer Based Testing (CBT) and E-marking had a mean of 1.20; the mean of knowledge of Computer Adaptive Testing (CAT) was 1.28,whilecompetence in the use of computer tools (e.g. Skype and Web cam) for audio-visual recording had a mean of 1.30. This implies that extension agent skills or competence in the use of internet for accessing and sourcing relevant messages for their clienteles was generally low.

The low level of internet proficiency observed among the extension agents in this study may be connected with the non-inclusion of ICT in extension training programmes in Nigerian agricultural sector. The outcome of this study supports the work of Arokoyo (2005) and Chikwendu (2001) that most extension agents lack the skills and literacy to fully utilize the internet and other common software.

Table 3:Distribution of Respondents according to Level of Internet Proficiency

S/No	Proficiency	Level of Proficiency			Mean
		Low	Moderate	High	
1.	Use of computer based packages (Microsoft, Power point, Excel, Word and Corel Draw)	17(42.5)	21(52.5)	2(5.0)	1.63
2.	Performance of basic computer tasks (e.g saving documents, using mouse/pad to navigate, opening documents, changing fonts and font sizes)	15(37.5)	21(52.5)	4(10.0)	1.73
3.	The use of computer packages like Auto-CAD in sketches, drawing and illustrations	34(85.0)	6(15.0)	0(0.0)	1.15
4.	The use of social media networking tools (Facebook, Twitter etc) to communicate	13(32.5)	19(47.5)	8(20.0)	1.88
5.	Performance of basic internet tasks (searching/surfing, composing e-mail, attaching files, sending e-mail/opening e-mail, scanning e-mail document for virus)	15(37.5)	23(57.5)	2(5.0)	1.68
6.	Use of visual library and search engines	16(40.0)	22(55.0)	2(5.0)	1.65
7.	Knowledge of computer base testing (CBT) and e-marking	32(80.0)	8(20.0)	0(0.0)	1.20
8.	Mastery of computer-based packages (eg. Adobe, Web page design, File Structure, IPSO and Access)	35(87.5)	5(12.5)	0(0.0)	1.13
9.	Competence in the use of computer-based desktop publishing	27(67.5)	13(32.5)	0(0.0)	1.33
10.	The quality qualifications acquired in computer operations/application	26(65.0)	13(32.5)	1(2.5)	1.38
11.	Competence in the use of computer tools (eg. Skype and Web cam) for audio-visual recording	28(70.0)	12(30.0)	0(0.0)	1.30
12.	Knowledge of computer adaptive testing (CAT)	30(75.0)	9(22.5.0)	1(2.5.0)	1.28
13.	Navigation skills to move from one field to another	21(52.5)	18(45.0)	1(2.5)	1.50
14.	Proficiency in the use of computer assisted learning materials like CD ROM	14(35.0)	23(57.5)	3(7.5)	1.73

Figures in parenthesis are percentages

Constraints to the use of Internet by the Respondents

The result of factor analysis of the constraints to internet usage by extension agents in the study area is presented in Table 4.Three (3) categories of factors militated against internet usage. These categories of factors included, socioeconomic factors, infrastructural factors and technical factors. The socioeconomic factors werehigh cost of internet facilities (0.82), lack of confidence in operating ICT facilities (0.73), low disposable income (0.34), low ICT literary (0.55) and high cost of repairs (0.50). The infrastructural factors were limited internet coverage (0.78) and unreliable power supply (0.61).Technical factors were complexity of internet facilities (0.61), lack of sufficiently trained computer operators (-0.39), lack of supportive government policies (0.73), overload of not relevant or useful information (0.52) and network congestion (0.42).

Extension agents must therefore build their confidence to use the internet. Providing solutions to the infrastructural and technical problems faced by the respondents will also encourage their use of the internet to access and share agricultural information with their clients.

Table 4: Constraints to use of the Internet

S/No	Constraints	Factor 1	Factor 2	Factor 3
1.	High cost of internet facilities	0.82*	- 0.11	0.22
2.	Limited internet coverage	- 0.08	0.78*	0.00
3.	Lack of confidence in operating ICT facilities	0.73*	0.26	- 0.15
4.	Unreliable power supply	0.44	0.61*	0.04
5.	Complexity of internet facilities	0.06	- 0.05	0.61*
6.	Lack of sufficiently trained computer operators	0.18	0.28	- 0.39*
7.	Low disposable income	0.34*	0.23	0.08
8.	Lack of supportive government policies	0.11	0.25	0.73*
9.	Low ICT literacy	- 0.55*	- 0.25	- 0.12
10.	High cost of repairs	0.61	0.05	0.24
11.	Undesirable content	0.11	0.51	0.53*
12.	Overload of not relevant or useful information	0.12	0.49	0.52*
13.	Network congestion	0.07	0.18	0.42*

Effect of Socioeconomic Characteristics of the Respondents on the Level of Internet Usage

Logistic regression was used to test the effect of respondents' socio economic characteristics on their level of use of internet and the result is presented in Table 5. Out of the seven explanatory variables in the model, only two were statistically significant; age and income of the respondents.

Age had a negative coefficient (-.042) and was significant (0.039) at a 5% level of probability. This implies that the older an extension agent becomes, the less likely to use the internet in accessing relevant messages for his target audience or clienteles.This trend may have significant implication for internet usage, since the elderly might be less interested in using hi-tech communication devices and prefer oral and printed information channels which are less efficient (Adegbola and Bamishaye, 2013).

Income had a positive coefficient (0.00) and significant (0.04) at a 5% level of probability. This implies that respondents with higher income have higher probability of using the internet. Fund is an important factor in the use of Internet because money is required in subscribing for Internet where it is not readily available in the offices. Even when Internet isavailable, there are some fees that must be paid to access some information on the Internet and this is a function of money. Therefore, increased income leads to high level of use of the internet by the respondents. The Nagelkerke R^2 for the regression is 0.343, indicating that the variables tested accounted for 34.3% of the variations in the dependent variable. The chi-square value of the model was 10.17 and was not statistically significant at 5% level of probability. This implies that the respondentsselected socio-economic characteristics did not affect their level of use of internet, thus, the null hypothesis for the study is accepted.

Table 5: Effects of the Socioeconomic Characteristics of Respondents on the Level of Internet Usage

Socio economic characteristics	B	S.E	Wald	Sig	Exp (B)
Age	-.042	.102	3.172	.039*	.959
Marital status	1.858	1.191	2.436	.119	6.411
Income	.000	0.000	3.523	.040*	1.000
Education	-2.105	1.519	1.921	.166	.122
Household size	-.257	.339	.577	.447	.773
Experience	.386	.236	2.679	.102	1.472
Constant	-5.180	5.748	.812	.367	.006

χ^2= 10.17, Sig. = .117, 2log likelihood ratio = - 33.62, Nagelkerke R^2 = 0.343

Note: * represent significance at 5% level of probability

IV. Conclusion And Recommendations

Conclusion

The results of this study reveal a population that is predominantly female, advanced in age, married, and with a formal education. They however, have long years of working experience, earn high incomes, and have large families.

The majority of the respondents had low level of internet use and low level of internet proficiency.The major factors affecting the usage of internet were socio-economic, infrastructural and technical in nature. The socio-economic characteristics of the respondents had no significant effect on their level of internet usage.

Recommendations

Based on the findings of this research, it was recommended that;

1. Extension agencies should create awareness and organize in-service training for the staff periodically on better skill acquisition in basic computer appreciation and innovative ICT bases system and regular upgrading of internet skills in order to improve their proficiency and level of internet usage.

2. It is necessary that access to internet facilities be provided by the government and non-governmental organisations with other supporting amenities such as a constant supply of electricity, as well as other infrastructure required for using the internet.

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