

ASSESSMENT OF AGRICULTURAL EXTENSION AGENTS TRAINING NEEDS ON ICT USE IN OSUN STATE, NIGERIA: APPLICATION OF BORICH MODEL

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Abstract

The study assessed the training needs of Agricultural Extension Agents (AEAs) on ICT use in Osun State, Nigeria. Also, their attitude towards ICT use in the day to day activities of their job was studied. Ten Local Government Areas and 1 Area office were randomly selected out from which 54 AEAs were selected for the study. Borich needs assessment model was used to assess the perceived level of importance and ability of the AEAs concerning the 16 competencies on ICT use in extension delivery. The Mean Weighted Discrepancy Score (MWDS) for the competencies ranged from -2.00 to 1.60. The study identified the in-service training needs of AEAs to include receiving and disseminating agricultural information through e-mail, presenting television programme and organizing and setting up of various ICT equipment. More than half (57.4%) of the AEAs had indifferent attitude towards ICT use in extension delivery. The study recommends that in planning development programme for the AEAs in ICT use in the study area, emphasis should be on the professional competencies with the highest MWDS.

Keywords: Assessment, Agricultural extension agent, ICT use, Borich assessment model

Introduction

Perhaps the most important objective of agricultural extension in developing countries is to improve the productivity and livelihoods of rural farm families. To accomplish this lofty objective, extension has as one of its important tasks; the exchange and sharing of information, knowledge and skills. In the words of Arokoyo (2011), “extension therefore is essentially communication, a process whereby various participants are linked and exchange information, a critical requirement for sustainable development”. The paradigm shifts in development concept towards participation and sustainability coupled with revolution in the information and communication technologies (ICT) has provided opportunities for extension

and rural communities to move into the information age.

Food and Agriculture Organization (FAO) (1993) defines ICT as technologies involved in collecting, processing, storing, retrieving, disseminating and implementing data and information using microelectronics, optics and telecommunication and computers. In the same vein, ADB (2003) described ICT as a set of activities that facilitate by electronic means the processing, transmission and display of information. The term ICT now appears to be commonly used to embrace a multitude of media, including telephone, television, video, telex, voice information systems and fax as well

as those requiring the use of personal computer fitted with a modem. (Warren 2002)

Omotayo (2011) opined that the application of many of the ICT devices is not entirely new in agricultural extension and rural development yet the use of ICT has witnessed an upsurge in recent years in almost all areas of rural life in several African countries despite the persisting problems of access, connectivity, literacy, content and cost (Technical Centre for Agriculture (CTA), 2003). One of the numerous areas of ICT application in agricultural development is the broad basing of agricultural extension activities (Meera, Jhamtani and Rao, 2004). This broad basing of extension activities required agricultural extension agents (AEAs) to be at the cutting edge of extension and master of many trades which is a little difficult. ICT comes in handy to enable AEAs to gather, store, retrieve and disseminate a broad range of information needed by farmers, thus transforming them from mere extension workers into multiple knowledge workers.

The emergence of this kind of knowledge workers will result in the achievement of the much elusive bottom-up, demand driven technology generation, assessment, refinement and transfer (Omotayo, 2011). This will definitely add value to extension service delivery and also serves as help against the problem of time, distance and sometimes mobility often faced by extension agents in the discharge of their duties. In the light of the potentials of ICT and the attending benefits it promises extension service delivery, a proper assessment of the perception of AEAs on its importance to the success of their work and their competencies in utilizing various ICT equipment is needed if in-service programme will be designed to help them maximize the potentials of ICT in the day to day activities of extension services. Therefore, the objectives of the study are five: describe the personal characteristics of AEAs in the study area, determine the AEAs perceived level of importance of various competencies in ICTs in extension service delivery; determine the AEAs

perceived level of ability on ICT use in extension service delivery; determine the in-service training needs of AEAs in ICT use; and determine the attitude of AEAs towards ICT use in extension service.

Methodology of the study

The study design is a descriptive one. It focused on the population of all AEAs attached to the Local Government Areas in Osun State, Nigeria. The state has 30 LGAs and 1 Area Office with about six AEAs per LGA though employed by the state but attached to each LGA although some had left leaving various number ranging between 2 and sometimes 6 in the LGAs. Ten LGAs and 1 Area Office were randomly selected for the study and all the AEAs attached to them were sampled giving 54 AEAs for the study. The 16 competencies in ICT use in extension service delivery were summarized and validated by experts in the Department of Agricultural Extension and Rural Development of Obafemi Awolowo University, Ile-Ife, Nigeria. Reliability values for the importance and ability levels were 0.72 and 0.78 respectively. AEAs were asked to rate the 16 competencies listed in the study on a Likert type scale to reflect their importance to the success of extension service delivery. The scaling follows not important (1), of little importance (2), somewhat important (3), important (4) and very important (5). Also, AEAs were asked to rate their self-perceived level of ability in the 16 competencies by using a Likert type scale with (1) as not competent, (2) little competence, (3) somewhat competent, (4) competent and (5) very competent. The attitude of AEAs to ICT use was measured on a Likert scale ranging from (1) strongly disagree, (2) disagree, (3) agree and (4) strongly agree. Data collected were analyzed using the Statistical Package for Social Scientist (SPSS 20) and Borich calculator (Mckim and Saucier, 2011). Descriptive statistics (frequencies, percentages, mean and standard deviation) were used to summarize the data. A mean weighted discrepancy score (MWDS) was calculated to

reveal the overall rankings of each of the 16 competencies. To determine the MWDS, the following statistical methods were followed. A discrepancy score was calculated for each competency by subtracting the ability rating from the importance rating. A weighted discrepancy score for each competency was calculated by multiplying the discrepancy score for the competency by the mean importance rating. A mean weighted discrepancy score for each of the competency was calculated by dividing the sum of the weighted discrepancy score by the number of observations (Borich, 1980; Alibaygi and Zarafshani, 2008). MWDS was therefore used to rank the competencies and determine the in-service training needs of AEAs on ICT use in extension service delivery. The higher the MWDS, the higher the requirement for in-service training in the said competency.

Results and Discussion

Personal characteristics of agricultural extension agents

Results in Table 1 revealed that majority (81.5%) of the extension agents in the study area are male with 18.5 percent female. This implies that the extension profession is still dominated by males although female representation is acknowledged. The mean age of the extension agent was 38.72 years with a standard deviation of 6.07. Many (61.1%) of the extension agents are between the ages of 31 and 40 years while 25.9 percent are between 41 and 50 years of age. Many (64.8%) of the extension agents have been in service between 6 and 15 years while 29.6 percent have been involved with extension work about 5 years or less. The mean year of length of service for agents studied was 6.85 years with a standard deviation of 4.24. Many (63.0%) of the agents had HND/BSc degree while 20.4 percent of them had OND and 16.7 percent of them had MSc degree.

Nearly all the various specialization in agriculture was represented in the specialization of the extension agents sampled. About 29.6 percent of the extension agents specialized in

agricultural extension while 24.1 percent specialized in animal science and 16.7 percent apiece specialized in agronomy and agricultural economics respectively. This shows that agricultural extension work in Osun state is not an exclusive reserve of the agricultural extension specialists but cut across all specializations in agriculture. The effect of this on extension service delivery is beyond the scope of this study. Many (68.5%) of the respondents are not members of any professional association while 31.5 percent are members of professional association.

The average monthly income of the extension agents is ₦43,363 with a standard deviation of ₦9, 567. More than half (55.6%) of the extension agents earned monthly income less or equal to the group average while 44.4 percent of them earned monthly income more than the group average. The average farmer/farm family that each of the extension agent is responsible for is 107 with a standard deviation of 105. Many (68.5%) of the extension agent cover 100 or less farmer/farm families while 20.4 percent cover between 101 and 200 farmers'/farm families. Only 3.7 percent of the extension agents cover more than 400 farmer/farm families.

AEAS perceived level of importance of listed ICT to extension work

Result in Table 2 revealed the rating of AEAs of the perceived importance of the listed competencies in ICTs to the success of extension work. Result showed that GSM for making calls or sending text messages to colleagues and farmers ($\chi=4.759$) ranked first, followed by GSM use as electronic diary and reminders for meetings and events ($\chi=4.148$). Computer for data processing ($\chi=3.722$) ranked third while Computer for word processing ($\chi=3.574$) ranked fourth. Assessing information for research on the internet ($\chi=3.574$) and documenting events through video recording ($\chi=3.426$) ranked fifth and sixth respectively. Other ICTs and their corresponding mean values for level of importance were also presented in Table 2.

Table 1: Personal Characteristics of Respondents

Variable	Frequency	Percentage	Central tendency
Gender			
Male	44	81.5	
Female	10	18.5	
Highest educational level			
OND	11	20.4	
HND/BSc	34	63.0	
MSc	9	16.7	
Specialization			
Agronomy	9	16.7	
Animal science	13	24.1	
Soil science	4	7.4	
Crop related	3	5.6	
Agric. Economics	9	16.7	
Agric. Extension	16	29.6	
Membership of professional Association			
Yes	17	31.5	
No	37	68.5	
Age of agents in years			
≤ 30	4	7.4	
31 – 40	33	61.1	mean = 38.72
41-50	14	25.9	std. dev.= 6.07
51+	3	5.6	
Length of service			
≤ 5 years	16	29.6	
6 -15	35	64.8	mean = 6.85
16 – 25	2	3.7	std. dev.= 4.24
26+			
Monthly income in Naira			
≤ 43363.80	30	55.6	mean = 43363
43363.81+	24	44.4	Std. dev.=9567
Farmer/farm families covered			
≤ 100	37	68.5	
101 – 200	11	20.4	mean = 107
201 – 300	3	5.6	Std. dev. = 105
301 – 400	1	1.9	
401	2	3.7	

Field survey, 2012

AEAS perceived level of competence on the listed ICTs in extension work

Furthermore, result in Table 2 also, showed the rating of the competency of the AEAs on the listed ICTs. Extension agents rated their competence highest in using GSM for making calls or sending text messages to colleague and farmers ($\bar{x}$ =4.833). This was followed by their ability in using GSM as electronic diary and reminders for meetings and events ($\bar{x}$ =4.630) and using Computer for word processing ($\bar{x}$ =3.899) respectively. Result in the table further showed that extension agents competence in using computer for data processing ($\bar{x}$ =3.574) ranked fourth while their ability in assessing information for research on the internet ($\bar{x}$ =3.352) and scripting of radio programme ($\bar{x}$ =3.296) ranked fifth and sixth respectively. Other ICTs alongside their

corresponding mean competency value were also presented in Table 3.

AEAS training needs on ICT use in extension services delivery

Result in Table 3 revealed the ranking of the listed ICTs based on MWDS calculated. The five highest ranking training needs on ICT use of AEAs as determined by the MWDS are receiving and disseminating agricultural information through e-mail (1.60), presenting television programme (1.58), documenting events through video recording (1.52), scripting of radio programme (1.40) and organizing or setting up various ICT equipment (1.09). In line with the benefits of participatory methodology these five professional competencies are important areas that AEAs will appreciate in-service training programme in order to improve their performance on the job.

Table 2: Mean Importance AND Ability of Professional Competencies

Statements	Importance Mean	Rank	Ability Mean	Rank
GSM for making calls or sending text messages to colleagues and farmers	4.759	1 st	4.833	1 st
GSM use as electronic diary and reminders for meetings and events	4.148	2 nd	4.630	2 nd
Computer for word processing	3.574	4 th	3.899	3 rd
Computer for data processing	3.722	3 rd	3.574	4 th
Power point preparation and presentation	3.241	8 th	3.296	6 th
Scripting of radio programme	3.278	9 th	2.852	10 th
Presenting radio programme	3.093	13 th	2.833	11 th
Scripting of television programme	3.000	14 th	2.796	13 th
Presenting television programme	3.167	11 th	2.667	14 th
Documenting events through Digital camera	3.204	10 th	2.926	9 th
Documenting events through video recording	3.426	6 th	2.982	8 th
Assessing information for research on the internet	3.574	4 th	3.352	5 th
Membership of social network on the internet	3.019	12 th	3.093	7 th
Receiving and disseminating information through e-mail	3.315	7 th	2.833	11 th
Use of projectors in lectures and seminars	2.963	15 th	2.630	15 th
Organizing and setting up various ICT equipment	2.796	16 th	2.408	16 th

Field Survey, 2012

Electronic mail in recent time had become an established channel of information dissemination across the globe. It cost less compared to regular mail by post and it is very fast. Proper

utilization of this by AEAs will greatly improve information dissemination with colleagues, other stakeholders and even farmers. Therefore, it is important for AEAs to be trained on this. Also

adequate knowledge on presenting television programme will go a long way helping extension delivery since television has the ability to help farmers understanding since it communicates to their sense of hearing and seeing at the same time therefore reinforcing learning. Training AEAs in this will be very advantageous to their work.

Documentation of events for future reference is important. Therefore, training AEAs on the handling of video camera for adequate

documentation is necessary. Radio still enjoys the highest patronage in the rural area even in areas without electricity. The ability of AEAs to write and produce good radio programme will help reach many farmers and clientele groups. Hence the need to train AEAs in this area. AEAs are field workers; therefore, their ability to organize and set up various ICT equipment will help their performance on the job. Therefore, training them on organizing and setting up various ICT equipment is needed.

Table 3: Mean weighted discrepancy scores (MWDS) of the Professional Competencies

Statements	MWDS	Rank
GSM for making calls or sending text messages to colleagues and farmers	-0.35	14 th
GSM use as electronic diary and reminders for meetings and events	-2.00	16 th
Computer for word processing	-1.13	15 th
Computer for data processing	0.00	11 th
Power point preparation and presentation	-0.18	12 th
Scripting of radio programme	1.40	4 th
Presenting radio programme	0.80	8 th
Scripting of television programme	0.61	10 th
Presenting television programme	1.58	2 nd
Documenting events through Digital camera	0.89	7 th
Documenting events through video recording	1.52	3 rd
Assessing information for research on the internet	0.79	9 th
Membership of social network on the internet	-0.22	13 th
Receiving and disseminating information through e-mail	1.60	1 st
Use of projectors in lectures and seminars	0.99	6 th
Organizing and setting up various ICT equipment	1.09	5 th

Field Survey, 2012

Attitude of AEAS towards ICT use

Result in Table 4 showed the ranking of the six attitudinal statements on the pre-disposition of AEAs to ICT use in the study area. From the table, the statement “extension work can be greatly enhanced by ICT” ranked highest ($\chi=3.630$). This was followed by the statement “ICT removes a lot of cost, barriers and saves time ($\chi=3.241$). The statement “the benefits of ICT use outweigh the financial burden involved” ranked third ($\chi=3.333$) while the statement “ICT are too complicated and hard to use” ranked last ($\chi=1.741$). Further analysis of AEAs attitude revealed the mean attitudinal score to be

18.96 with a standard deviation of 2.91. AEAs attitude was classified into positive, negative and indifferent to ICT use.

The result in Table 5 revealed that more than half (57.4%) of the AEAs had indifferent attitude toward ICT use with attitudinal score of 16.05 and 21.88 while 24.1 percent of the AEAs had positive attitude towards ICT use attitude with attitudinal score of greater than 21.88. Only 18.5 percent of AEAs had negative attitude towards ICT use with attitudinal score less than 16.05.

Table 4: Attitude of Agricultural Extension Agents Towards ICT Use

Attitudinal statements	Mean	Rank
ICT use is good but not necessary in extension service delivery	1.852	5 th
Extension work can be greatly enhanced by ICT	3.630	1 st
ICT are too complicated and hard to use	1.741	6 th
ICT removes a lot of cost, barriers and saves time	3.241	2 nd
The financial burden of using ICT is unbearable	2.148	4 th
The benefits of ICT use outweigh the financial burden involved	3.333	3 rd

Table 5: Classification of Respondents' Attitude Towards ICT Use

Attitudinal score	Frequency	Percentage	Central tendency
≤ 16.05	10	18.5	Mean = 18.96 Std. dev. = 2.91
16.05 – 21.88	31	57.4	
≥ 21.88	13	24.1	

Field Survey, 2012

Conclusions and Recommendations

The study concluded among many others that the ratio of men to women as extension agent is almost 4:1. The average age of the AEAs was 38.72 years with a standard deviation of 6.07. Many of the agents had HND/BSc degree with only a few of them specializing in agricultural extension. Average income of AEAs is ₦43,363 and each of them is responsible to at least 107 farmers'/farm families. GSM for making calls or sending text messages to colleagues and farmers, GSM use as electronic diary and reminders for meetings and events and computer for data processing led the list of importance ranking for the 16 ICTs listed respectively while GSM for making calls or sending text messages to colleagues and farmer, GSM use as electronic diary and reminder for meetings and events and computer for word processing led the list of ability ranking on the 16 listed ICTs.

The 5 leading in-service training needs of AEAs on ICT use from the MWDS calculated was receiving and disseminating agricultural information through e-mail, presenting television programme, documenting events

through video recording, scripting of radio programme and organizing and setting up various ICT equipment. Also more than half of AEAs are indifferent towards ICT use in extension service delivery. Although the study did not look into the availability and accessibility of these ICT equipment to the AEAs, it is recommended that any programme that will encourage the use of ICT by AEAs in extension service delivery should look into addressing the identified areas of training needs of the agents on ICT so as to maximize the potential of ICT in knowledge dissemination to farmers to enhance agricultural productivity, ensure food security and improve their quality of life.

References

- Asian Development Bank (2003). *A strategic approach to information and communication technology toward e-development in Asia and the Pacific*. Asian Development Bank.
- Alibaygi, A and Zarafshani, K (2008). Training needs of Iranian extension agents about sustainability: The use of Borich need assessment model. *African Journal of Agricultural Research* Vol.3 (10). <http://www.academicjournals.org/AJAR>

- Arokoyo T. (2011). ICTs Application in Agricultural Extension Service Delivery in *Agricultural Extension in Nigeria*. ARMTI, Ilorin. A publication of AESON Nigeria.
- Borich, G (1980). A needs assessment model for conducting follow-up studies *J. Teach. Educ.* 31 (1).
- CTA (Technical Centre for Agriculture) (2003). *ICTs –Transforming Agricultural Extension?* An e-discussion, 20th August – 29th September.
- FAO (Food and Agricultural Organization) (2003). *The potential of microcomputers in support of agricultural extension, education and training*. Rome.
- McKim, B. R. and Saucier, P. R. (2011). An Excel-Based Mean Weighted Discrepancy Score Calculator. *Journal of Extension* Vol 49 (2) 2TOT8
- Meera, S.N, Jhamtani, A, and Rao, D.U.M. (2004). Information and communication technology as Agricultural Development: A comparative analysis of three projects from, India. *Agricultural Research & Extension Network* Paper No 135
- Omotayo, O.M. (2011). ICT and Agricultural Extension: Emerging issues in transferring Agricultural Technology in developing countries in *Agricultural Extension in Nigeria*, ARMTI, Ilorin. A publication of AESON Nigeria.