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Experiential Analysis of Awareness and Adoption of E-Extension Among Poultry Farmers in Gombe State, Nigeria

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Abstract
The study assessed the e-extension awareness and adoption among poultry farmers in Gombe state, Nigeria. The study had two objectives, two research questions and two null hypotheses. Survey design was adopted for the study. The population of the study was 798 registered poultry farmers under Poultry Farmers Association of Nigeria Gombe state. Proportional sampling technique was used to select 240 poultry farmers for the study. The instrument for data collection was a questionnaire. The instrument was administered by researcher assisted by 3 research assisted using direct contact. The data collected were analyzed using mean scores to answer the research questions. ANOVA was used to test the null hypotheses at the significance level of 0.05. The study revealed that poultry farmers are aware and also adopt poultry farming technologies through e-extension programme in Gombe State. It was concluded that e-extension facilities significantly contributed on awareness, adoption and effectiveness among poultry farmers in Gombe state. It was recommended among others that facilities for e-extension programme should be use effectively in disseminating new techniques, skills and innovations in poultry farming.
Keywords: Awareness, Adoption, E-Extension, Poultry, Farmers
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INTRODUCTION

The successful implementation of agricultural development programme in any developing country largely depends on the nature and extent of the use of e-extension in mobilizing farmers. Communication has been acknowledged as playing a vital role in the success of agricultural production, innovations and adoption, (Global Communication Research Association (2013). The planners of e-extension in developing countries have realized that the development of agriculture could be hastened with the effective use of e-extension technology 2013.

E-extension is the use of electonic technology especially information Ccommunications technology ICT to enhance face-to-face and paper-based transactions, these technologies can be as simple as teleconferences or as complex as wikis and blogs (Adeyanju & Akinwumi, 2015).According to the author, the usefulness of research outcome is generally achieved throughan efficient mechanism of information transfer to the appropriate target (farmers).The transfer of information to the target audience at the required time could only be effectively achieved by use of e-extension technology depending on the purpose and the number of farmers to be reached (Hellstrom, 2010).

The relationship between poultry farming and e-extension services important in developing countries, because farmers would adequately get access to most critical services such as relevant, actionable and timely information needed to improve productivity,(Global System Multi-Media for Agriculture,(GSMA, 2015). Most of the available services are aimed at improving the agriculture value chain and have a wide range of functionalities as provision for market information, extension services and marketing facilitation (Qiang, Kuek, Dymond & Esselaar, 2012). A goal-based typology of classification of mobile agriculture services which used to explore the various e-extension services, available for different needs in poultry farming and other related activities within the agriculture sector, these services range from the platform that provide education and awareness information, commodity prices and market information platforms, data collection tools platform, diseases and pest outbreak warning systemsand so on(Hellstrom, 2010).Various platforms ware implemented using available information communication technologies such as short messaging service (SMS), Interactive Voice Response (IVR), downloadable applications, Unstructured Supplementary Service Data (USSD) and web. Most of these services would be duplicated across different technologies in order to accommodate a large number of clienteles that can provide a wider array of information delivery devices among the end users. Radio is favoured as a medium of communication to communities because of the enormous advantages ascribed to it; interms of transcending barrier of illiteracy and demanding less intellectual exertion than the print media massages (Bello & Obinne 2012).

E-extension programmeis an aggressive shift in extension service delivery envisioning a revolutionalized crop and animal production. (Folarin, 2009). Among the e-extension delivery channels, are short messaging service (SMS), electronic mails, (e-mails), voice calls, online discussion, forums and instant messages (IM). Despite the fact that many researches were conducted on the importance of e-extension awareness and adoption

and effectiveness among poultry farmers in agricultural productivity.No such study was conducted and documented in the study area, andthis may limits the farmers' awareness of an improved way to poultry technology development whicheventually affects the livelihood of these farmers, creating a huge gap that tends to limit awareness and efficiency of e-extension information dissemination for improve agricultural activities (Hellstrom, 2010).

The major concern of e-extension as an educational process is to help poultry farmers to make a decent living and master the best way to handle their farms and improve the standard of living through assessing, analysing, adopting, diffusing and accepting new technologiesand practices of e-extension services (Omar & Helena, 2008). It therefore means that e-extension is an essential source of latest Information on agriculture especially poultry farming; consequently access to this information is key in the improved poultry farming technology and performance in rural areas (Lwoga, Stilwell & Ngulube, 2011).

Despite the importance of e-extension, studies have revealed that, dissemination of information to rural areas where most of the critical agricultural activities take place and wherever 80% of the population lives is still inadequate (Adolwa, Okoth, Mulwa, Esilaba, Mairura, and Nambiro, 2012). Studies by various scholars (Dare, Sunday, Olumuyiwa & Onyekwere 2014; Lwoga, Stilwell & Ngulube, 2011) have shown that there is lack of awareness and needs for its adoption by poultry farming information in the rural areas of Nigeria. Lacks of awareness and adaptation have enhanced poverty and ignorance within the rural population. From the foregoing, it is therefore imperative to assess the levelof e-extension awareness, adoption and effectiveness in knowledge and skills among poultry farmers in the study area.based on the foregoing, the study sought to (1) ddetermine the level of awareness created by e-extension programme in poultry farming in Gombe state; and (2) determine the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State?

Research Questions

The following research questions are design to serve as guide to the study:

1. What is the level of awareness created by e-extension programme in poultry farming in Gombe state?
2. What is the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State?

Research Hypotheses

The study is guided by the following research null hypotheses

$H0_1$ There is no significant difference among the mean responses of the respondents based on their Local Government on the level of awareness created by e-extension programme in poultry farming in Gombe state.

$H0_2$ There is no significant difference among the mean responses of the respondents based on their Local Government on the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State?

METHODOLOGY

Descriptive survey was used for this study Basavaprabhu, Diapk, Ghadei and Kendadmath, (2016) explained survey research as the research design in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. It is therefore deemed appropriate in this research because it is aimed at assessing the e-extension awareness, adoptionand effectiveness among poultry farmers in Gombe State, Nigeria.

The population of this study comprised of 798 registered poultry farmers across three senatorial districts of Gombe state. The choice of registered poultry farmers was due to their easy accessibility and collaboration. The researchers used **a** proportionate sampling technique was used to select 240 respondents guided by Krejcie and Morgan (1970) recommendation. In each of local government, random sampling technique was used to choose to farmers that participated in the study.

The instrument used for data collection was 53 items self structured four point rating scale questionnaire. The instrument is structured as follows: Strongly Agreed (SA) 4 points, Agreed (A) 3 points, Disagreed (D) 2 points, and Strongly Disagreed (SD) 1 point. The pilot study of the instrument gave a reliability coefficient of 0.85. The researcher employed 3 research assistants were employed and trained. The co-opted research assistants assisted in the distribution of the instrument using Direct Contact Approach (DCA). Each research assistant covered a specific senatorial zone while the research oversees them. The entire exercise lasted for one month.

The method that was used to analyze the data collected was the Mean and Standard Deviation. The responses were used to answer the research questions. An interval scale was used to answer the research questions as seen in Table 1

Table 1: Decision rule of research questions

S/no	Mean score	Decision
1.	1.0 – 1.49	Very low
2.	1.50 – 2.49	Low
3.	2.50 – 3.49	High
4.	3.50 – 4.00	Very high

In the test of null hypotheses, Analysis of Variance (ANOVA) was employed to compare the responds of the respondents based on their local government. The hypotheses were tested at the level of 0.05 significance.

RESULTS AND DISCUSSIONS

Research Question one

What is the level of awareness created by e-extension programme in poultry farming in Gombe state?

Results in Table 2 revealed the mean scores ranged 2.82 – 3.59. The mean score obtained fall under agreed, this is also applicable to grand mean of 3.59 which fall under very high. The result suggested that respondents opined that the level of awareness created by e-extension programme in poultry farming in Gombe state was very high.

Table 2: Descriptive statistics of mean used to answer research question two

S/No.	Statement	Mean	S.D	Decision
1.	The level of awareness created by e-extension programme develops poultry farming to commercial agriculture	3.59	0.62	Agreed
2.	The awareness level created by e-extension programme educates poultry farmers on modern poultry farming techniques	3.32	0.72	Agreed
3.	The awareness level created by e-extension programme helps in reducing mortality rate in poultry farming	3.20	0.74	Agreed
4.	The awareness level created by e-extension programme educates poultry farmers on the impacts of quality feeds in poultry farming.	3.33	0.80	Agreed
5.	The level of awareness created by e-extension programme helps in ensuring the sustainability of poultry farming for national food security.	3.26	0.71	Agreed
6.	e-extension programme helps in creating awareness to improve on the bio security measures in poultry farming	3.20	0.79	Agreed
7.	e-extension programme mobilize poultry farmers to different poultry vendors that provides good and qualitative inputs for optimum production in poultry farming	2.82	0.88	Agreed
8.	The awareness created by e-extension programme helps in improving the breeding system in poultry farming	3.08	0.82	Agreed
9.	Level of awareness created by e-extension programme improves poultry farmer income	2.86	0.83	Agreed
10.	Level of awareness created by e-extension programme promotes hygienic measures in poultry farming	3.17	1.03	Agreed
	Grand Mean	**3.59**		**Agreed**

Source: Field Survey, 2018

Research Question Two

What is the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State?

The result in Table 3 used to answer research question two revealed the mean values ranged from 2.86 – 3.32 which were found to be greater than the cut-off point 2.50 for agreed. This is also applicable to the grand mean of 3.10. The obtained grand mean suggested that respondents opined that the level of adoption of poultry farming technologies through e-extension programme in Gombe State was high.

Table 3: Descriptive statistics of mean used to answer research question three

S/No.	Statement	Mean	Std. Dev.	Remark
1.	Through e-extension programme I understand the basic concept of poultry farming	3.23	0.77	Agreed
2.	Your adoption of poultry farming technologies has bestowed your marketing skills on poultry farming	2.86	0.81	Agreed
3.	Techniques adopted through e-extension programme has boosted your chances of being self-employed in poultry farming	3.03	0.85	Agreed
4.	Techniques adopted through e-extension programme had educated you on different types of housing system for poultry production	3.32	0.74	Agreed
5.	Techniques adopted through e-extension programme enables you to identify necessary personal characteristics of a successful entrepreneur in poultry production	3.06	0.75	Agreed
6.	Techniques adopted through e-extension programme trains you to apply problem-solving processes in poultry farming	2.98	0.84	Agreed
7.	Techniques adopted through e-extension programme made me to learn on the different types of debeaking methods for poultry management	3.00	0.84	Agreed
8.	Your adoption of poultry farming technologies increased your understanding on different routine medication practice in poultry management	3.15	0.77	Agreed
9.	Techniques adopted through e-extension programme demonstrates knowledge of how technological system works in poultry farming	3.15	0.83	Agreed
10.	Techniques adopted through e-extension programme enables me to procure and use materials effectively in poultry production	3.18	0.78	Agreed
	Grand Mean	**3.10**	**0.80**	**Agreed**

Source: Field Survey, 2018

Research Hypothesis One

There is no significant difference among the mean responses of the respondents based on their Local Government on the level of awareness created by e-extension programme in poultry farming in Gombe state.

The test of null hypothesis revealed the F/10, .277 with p-value greater than the level of the significance (.980>0.05). The result suggested that there was no significant difference among the mean responses of the respondents based on their Local Government on the level of awareness created by e-extension programme in poultry farming in Gombe state. The hypothesis was retained.

Table 4: Analysis of Variance used to determine null hypothesis two

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.989	10	.0989	.277	.980
Within Groups	89.571	226	.396		
Total	90.559	236			

Research Hypothesis Two

There is no significant difference among the mean responses of the respondents based on their Local Government on the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State?

The analysis of variance used to determine null hypothesis three revealed the F/10 = .245 with the p-value of .987. The p-value obtained was greater than the alpha value (.987>0.05), the result therefore indicated that no significant difference exists among the responses of the respondents based on their Local Government on the level of adoption of poultry farming technologies acquired through e-extension programme in Gombe State. The hypothesis was retained.

Table 5: Analysis of Variance used to determine null hypothesis three

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.910	10	.091	.245	.987
Within Groups	93.442	226	.413		
Total	94.352	236			

Discussion of Findings

The finding of this study on the level of awareness created by e-extension programme in poultry farming in Gombe state indicated that all the items identified were importance in creating awareness among poultry farmers. This finding is support by Bello and Obinne (2012) who confirmed that availability of agricultural information among its users for agricultural and rural development cannot be over emphasized. Agricultural information creates awareness among farmers about agricultural technologies for adoption which is needed for the overall

development of poultry farming, agricultural sector and for the improvement of living standard of farmers.

Uganneya, Ape and Ugbagir (2012), postulates the extents to which information services actually satisfy users and contribute to agricultural development are subject of controversy and debate. This is so because the diffusion and adoption of any given information to a large extent depends on the means through which the information is disseminated and invariably the perception, knowledge and understanding of the users on the channels through which the information is disseminated. Adequate awareness on any given innovation or technology is a key to the success in adoption and utilization of the technology. With regards to this, Ekumankma abd Nwankwo (2012) note that poor awareness or exposure of farmers to appropriate agricultural information and channels of communicating this information is one of the major reasons for low yield recorded by many Nigerian farmers as well as performance of agricultural extension agents in their duties. Therefore, for human performance to be effective and efficient some knowledge is needed on how, why and when certain things have to be done. The provision or availability of such knowledge is as important as its application to daily life. Agricultural extension agents as well as farmers need to get aware of the necessary information in order to improve methods in activities, increase productivity and performance. However, awareness to effective channels of acquiring information can improve and enable individuals in knowledge which would also enable them to confront their predicaments. Agriculture being a discipline requires the awareness and access for information that its users would adopt in anticipation of the improvement in its various activities. Diem, Hino, Martin and Meisenbach 2011) reported that "the advent of e-extension facilities namely personal computers, the internet and mobile telephone during the last two decades has provided a much wider choice in collection, storage**,** processing, transmission and presentation of information in multiple formats to meet the diverse requirement and skills of people". Similarly, Durojaiye, Abubakar, Omeneza, Muhammed, Wahab, Ismail and Musa (2013) reported that, the awareness creation and availability of an ICT -enabled agriculture centre (IAC) in villages (e.g. adopted villages) in Nigeria by NAERLS using internet, made farmers to be more informed on the development made through the utilization of the internet and other related e-extension facilities in in the country. Consequently, Adolwa, Okoth, Mulwa, Esilaba Mairura and Nambiro (2012) noted that agricultural extension agents in Enugu State, Nigeria had high level of awareness of the major e-extension facilities tools. This finding is similar to Adesope, Asiabaka, and Agumagu (2007), who noted that in the Niger Delta area of Nigeria; about 98 percent of the extension agents in the region indicated they were aware of information communication technologies.

The finding of the study reveals that poultry farmers adopt poultry farming technologies through e-extension programme specifically the radio and television due to its viability and affordability. This is in line with Rogers (2003) who report that adoption of an innovation approach considers the analysis/ process from the broader perspective of both user perception and farmers' attributes resulting in a plan for carrying the adoption of technology effectively, which is rooted in the context of e-extension system which can also addresses the issues of concern to the intended user. Many researchers have been often assigned titles to individuals based on their adoption behaviour. The best-known scheme is by Rogers (2003) who categorised adoption of innovation in to segments; Early adopters, Early majority, Late majority and Laggards. Furthermore, Senyurekli, Dworkin and Dickinson (2008) reported that, for online adoption to be successful among adult audiences the information must be relevant to its targeted audience and they must have an appropriate skill to use the adopted technology in to practice. In studying the adoption of e-extension among farmers of agricultural Extension agents (Harder, 2007), suggest that respondents may not have the knowledge nor the skills needed to implement e-extension in their respective farms, unless if the farmers will be adequately motivated enough to adopt the innovation and likely for them to visit or contribute immensely to the development of online resource.

Conclusion

E-extension programme was effective in information dissemination to poultry farmers in Gombe State, it has wider coverage but has limitations in information dissemination. Based on the result of the study, majority of the poultry farmers in Gombe state uses radio, television, social networking sites and social media channels as the medium for acquiring new techniques, skills and innovations related to poultry farming. E-extension programme provide good ideas that help to improve poultry farming and guide poultry farmers on their production techniques. Furthermore, facilities for e-extension programme immensely created awareness on various marketing strategies for poultry products, help in improving housing condition in poultry farming and develops poultry farming to commercial agriculture, poultry farmers were still operating the traditional system which hindered the effective performance of the poultry farming as a venture.

Recommendations

Based on the findings of the study, the following recommendations were made: -

1. The state government should organise public orientation programme that will enlighten the poultry farmers on importance of e-extension programme in the state.

2. Technological innovation that will enhance the poultry farming should be made available by Gombe State ministry of agriculture.

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