
Factors Affecting use of Information Communication Technologies among Extension Agents in North-East, Nigeria

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Abstract

The study identified the levels of ICT use, awareness, accessibility, perceived organizational support, assessed the perception of the respondents on problems in using ICTs for agriculture extension work and, clarifies the relationships between awareness, accessibility, perceived organizational support, and use of ICTs. Data were collected through the use of a questionnaire distributed to 254 respondents using a multi-stage sampling and stratified sampling procedures. Mean, frequency, standard deviation and structural equation modelling in analysis of morement structure (AMOS) was used. Findings revealed that levels of ICT use ($\bar{x} = 3.43$), awareness ($\bar{x} = 3.40$) accessibility ($\bar{x} = 3.66$), and perceived organizational support ($\bar{x} = 3.574$) were moderates. The high cost of ICT garget ($\bar{x} = 4.71$), poor electricity supply ($\bar{x} = 4.69$), lack of training ($\bar{x} = 4.63$), ICT illiteracy ($\bar{x} = 4.61$), outdated contents ($\bar{x} = 4.61$), inability to use ICT ($\bar{x} = 4.55$) and network issue ($\bar{x} = 4.34$) were the critical problems in using ICTs in extension work. There was relationship between awareness, accessibility and motivation with ICT adoption among

extension agents. Governments should design a policy that will focus on awareness, training, access to ICTs among the extension agents, provide an alternative source of power, this will enable them to remain within the system and also increase their usage of ICTs in extension service delivery.

Keywords: Information and communication technologies, adoption, awareness, accessibility, perceived organizational support.

Introduction

A successful agricultural extension programme depends on sharing information, knowledge exchange, and effective communication and interaction among researchers, agricultural extension agents and farmers (Ali Muhammad, Norsida Man & Farrah Melissa Muharam, 2020; Zulqarnain, Norsida Man, Juwaidah Sharifuddin, Muhammad Roslan and Salim Hassan, 2020). According to Hassan, S, Galadima, M., Man, N. and Abu, I. (2019); Ramli, N.S., Norsida, M., Hassan, M. S., Bahaman, A. S., Omar, S. Z., Sarina, Y., Rahman, N. A. A., & Ibrahim, M. S. (2019); Wan Mohd, R. W. I. Norzaidi, M. D. and Roshidi, H. (2020), agriculture sector should evolve towards modern technology and ICT can help to facilitate knowledge management process to reach the goals of sustainable development.

The study examined factors affecting use of information communication technologies among extension agents in North-East, Nigeria

This study:

- (1) Identified the levels of awareness, accessibility, perceived organizational support and ICT use among the respondents
- (2) assessed the problems of using ICTs for agriculture extension works; and
- (3) examined the relationships between awareness, accessibility, perceived organizational support, and use of ICT's

Methodology

The research was carried out in Nigeria (North-East). This is composed of six (6) states Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. The area is situated between the latitude 6° 20' to 13° 00' from the North and 9° 00' to 14° 00' east of the Greenwich Meridian. The study used a multi-stage sampling and stratified sampling procedures to select the sample for the study. In the first stage, three states were randomly selected (Adamawa, Gombe & Taraba). The three states have a total population of 407 extension agents (Adamawa 138, Gombe 116 & Taraba 153). Finally, the 254 respondents were proportionately selected. Table 1 depict the process.

Table 1: Population and sample

Sample States	Population of Eas	Procedures	Sample
Adamawa	138	138/407= 0.339 0.339 × 254 = 86. 12	86
Gombe	116	116/407= 0.285 0.285 × 254 = 72. 39	72
Taraba	153	153/407= 0.375 0.375 × 254 = 95.48	95
Total	407	254	254

To ascertain the respondents' level of ICT use, awareness, accessibility, perceived organizational support, the scores were recorded in three categories: low (1- 2.33), moderate (2.34 – 3.66) and high (3.67-5.0). Mean, frequency, rate and 5-point Likert-type scale with ≥ 4.0 - a critical problem, 3.5-3.99 - very, serious problem, 3.0-3.49 – problem, 2.5-2.99 - less problem, ≤ 2.5 - not a problem were used to assessed the problems of using ICTs for agriculture extension works. Structural equation modelling was used to evaluate the relationship between awareness, accessibility perceived organizational support and ICT Use

Individual confirmatory factor analysis (CFA) was conducted on the entire construct to assess the fitness of the items and drop the bad items. First-order CFA was conducted and suggestions from modification indices were followed to meet the requirement.

Test for Model Fit

The criteria used in testing the model fit was the same applied to the measurement model and it's assumed that if the model fit of the individual construct is good that of the measurement model would be high. Measurement model was tested where it includes all the three variables (awareness, accessibility and perceived organizational support) with their corresponding construct. After running the measurement model, some few items were further dropped due to the problem of lower factor loading or the problem of high Modification Index (MI). Based on the model fit indices, the model fit the data very well. This is presented by the fit indices that met up the cut-off values. Table 2 shows a summary of the measurement model's goodness-of-fit indices.

Table 2: Summary of the goodness-of-fit indices

Name of Category	Name of Index	Recommended Value	Value (Results)
Absolute Fit	Chi-square	> 0.05	0.000*
	RMSEA	< 0.08	0.064
	GFI	> 0.9	0.808**
Incremental fit	CFI	> 0.9	0.979
	TLI	> 0.9	0.944
	IFI	> 0.9	0.949
	NFI	> 0.9	0.906
Parsimonious	Rel. chi-square	< 5.0	2.045

Note: *Not applicable for a large sample (more than 200). **Not achieved the accepted level

Results and Discussion

Characteristics of ICT Use

Table 4. shows characteristics of ICT use, in terms of level of use, awareness, accessibility, perceived organizational support. The result reveals that the mean score of ICT use was 3.43. This implies that the respondents were within the moderate level of ICT use in extension work. The respondent's level on ICT awareness reveals that the total average mean score was 3.40 This indicates that the majority of the respondents were in high and moderate level of ICT awareness, going by high level of significant percentage at the high and moderate level, the respondents for this study demonstrate high level of ICT awareness. The respondent's level on ICT access reveals that the mean score was 3.66. This indicates that the majority of the respondents were in moderate level of ICT accessibility, going by the average mean score the respondents for this study demonstrate moderate level of ICT access.

The respondent's level on perceived organizational support reveals that the total average mean score is 3.574. This indicates that majority of the respondents were in moderate level of perceived organizational support, going by the average mean score the respondents for this study has perceived moderate level of support from there organization. The findings agree with earlier studies (Umar et al. 2019); Man & Isah 2019); Muktar et al. 2019) who found moderate level of ICT use, awareness, accessibility and perceived organizational support among the extension agents.

Table 4: Characteristics of ICT use

Variables	Mean	SD
ICT Use	3.43	1.110
Awareness	3.40	1.031
Accessibility	3.66	1.072
POS	3.574	1.168

Problems using ICTs for Agriculture Extension Works

Table 5 shows the problems in using ICT in agricultural extension works. The perception of the respondents on problems in using ICTs in extension work differs, on some of the variables (high cost of ICT's, electricity problem, lack of training on ICT, ICT illiteracy, outdated contents in extension messages, inability to use ICT, network issue) were perceived as critical problems in using ICTs in extension work in the study area. The implication of this findings is that for ICT use by the agricultural extension agents to be fully successful in the study area there is an urgent need to remedy, improvise where possible and provide alternatives to the above mention critical problems. The results agreed with the findings of Ali *et al.*, (2018), Umar *et al.*, (2019) and Dire *et al.*, (2016 in separate studies.

Table 5: Problems using ICTs for agriculture extension works

Perception	Mean score	Rank
High cost of ICTs	4.71*	1
Electricity problem	4.69*	2
Lack of training on ICT	4.62*	3
Outdated contents (Belated extension messages)	4.61*	4
ICT illiteracy	4.61*	4
Inability to use ICT	4.55*	6
Network issue	4.34*	7
ICT services not available in the area	3.29	8
Technical faults	3.11	9
Lack of integration with other farm systems	2.87	10
Mobility issue	2.74	11
Handling issue	2.65	12
Do not have enough time	1.86	13
Lack of confidence to use	1.83	14
Lack of awareness	1.39	15

- = Critical problem. Survey: 2020)

Relationship between ICT Characteristics

The path analysis in SEM conducted was major to determine two sets of relationships.

Figure 2 shows a direct positive effect on the endogenous construct (ICT use).

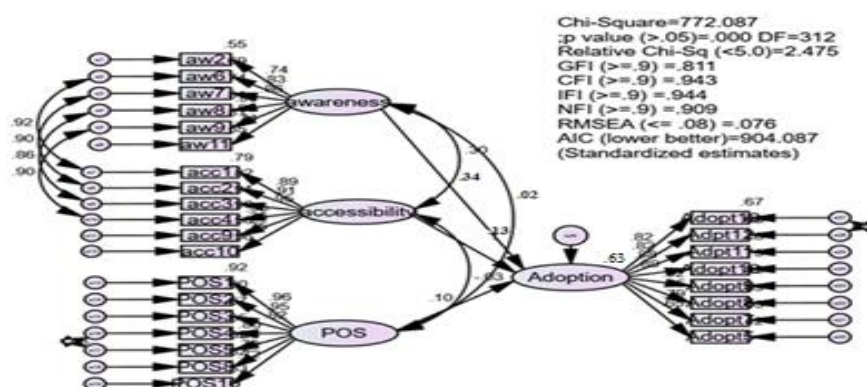


Figure 2: Standardized path of direct relationships

An R^2 value of .63, implying that the model explained 63% of the variation in ICT use. The standardized regression weights and level of significance were shown on Table iii

From the results of the direct effect of awareness and ICT use was positive This implies that awareness is vital to ICT use among the extension agents. Umar *et al.*, (2019) noted that poor knowledge or exposure of farmers to suitable agricultural information and networks of communication of this information is one of the key reasons for the low yield reported by many Nigerian farmers as well as the success in their duties of agricultural extension agents.

Durojaiye *et al.*, (2017) and Kwadwo *et al.*, (2016) reported that awareness predicts ICT adoption among the extension agents. Therefore, there is a need to enhance the level of awareness among the extension agents for increased ICT use in various aspect of extension work.

Likewise, accessibility had positive and significant influence on ICT use. The findings imply that accessibility has a significant contribution to ICT use among the extension agents in north-eastern Nigeria.

Similarly, perceived organizational support was found to have positive and significant at on ICT use. This means that POS has a significant influence on ICT use among the extension agents in the study area. This an indication that when the extension agents perceived positive contribution from their organization it will aid their ICT use in extension work. This study is also in agreement with studies Umar *et al.*, (2019) who found a strong relationship between POS and technology use.

Conclusion and Recommendations

The high cost of ICT's, electricity problem, lack of training, ICT illiteracy, outdated contents, inability to use ICT, network issues are critical problems in using ICTs in extension work. There was significant relationship between knowledge, accessibility, and motivation with ICT adoption. Governments should design a policy that will focus on awareness, training, access to ICTs among the extension agents, provide an alternative source of power, this will enable them to remain within the system and also increase their usage of ICTs in extension service delivery.

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