Mediating Role of Motivation in the Relationships between Awareness, Accessibility, Perceived Organizational Support and Adoption of ICT among Extension Agents in North-East, Nigeria

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ABSTRACT

The purpose of this study was to examine the mediation role of motivation in the relationships between awareness, accessibility, perceived organizational support, and adoption of Information and Communication Technology (ICT). The data was obtained using the multi-stage cluster sampling method with questionnaires administered to 254 respondents. While structural equation modelling was used for the analysis, Constructivism Theory, Digital Divide Theory, as well as Vroom's Expectancy Theory were adopted in the study. The majority of the respondents were males, married, and in their middle age with long years of work experience who had also obtained either high school diploma or Bachelor degree. The direct relationship paths showed that the exogenous construct [awareness, accessibility, Perceived Organizational Support (POS)] had a direct positive effect on the endogenous construct (ICT adoption) with an R^2 value of .23 (23%). The final model has an R^2 of 0.47 (47%) of the variation in ICT adoption explained by the model with a substantial increase in the direct model, which explains 23% of the variation. The mediation effect of motivation in the relationships between awareness, accessibility, POS, and ICT adoption was also established indicating partial mediation. The study recommends that extension organizations should be mindful of the motivation levels of their employee to facilitate the adoption of ICT in extension work, which will facilitate timely delivery of messages, cover the manpower shortages, reduce cost, as well as a total transformation of agricultural development in the area.

Keywords: Extension organizations, Information and communication technology, Structural equation modelling.

INTRODUCTION

Motivation is defined as a concept that has many researchers interested in unraveling the idea. Tranquillo and Stecker (2016) define motivation as the process that initiates, guides, and maintains goal-oriented behaviors, which involves and activates the biological, emotional, social, and cognitive forces. It is the workplace and personal characteristics that justify why people do their job (Uzonna, 2013). Research indicates two motivational forms: one intrinsic and the other extrinsic. The former is the guiding force emerging from inside in a sort of recognition of the importance of the research undertaken. The latter, in comparison, is the driving force emerging from eternal forces in a sort of circumstance that encourages an individual to accomplish the job efficiently, such as through high wages, appreciation, punishment, and others (Nawawi, 1998). Motivation material and processes are two general groups of hypotheses. Often the substance theories are called 'need theories' or 'psychological theories' that concentrate on the needs of an employee. It dwells on

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what motivates an individual. While process theories focus on motivation 'processes' and 'how' the motivation occurs (Uzonna, 2013), studies attempted to find a link between perceived organizational support (POS) and motivation. Extant literature (e.g. Maduka and Okafor, 2014; Kiruja and Muku, 2013) indicate that motivation has direct impacts on technology acceptance.

The present research predicts that motivation mediates the relationship between awareness, accessibility, perceived organizational support and technology acceptance among the extension personnel. Other researchers (e.g. Lee *et al*., 2012; Umar *et al*., 2015; Roos *and* Van Eeden, 2013; Soliha *et al*. 2014) revealed that motivation mediates the relationship between awareness, accessibility, perceived organizational support, perceived organizational support, and technology acceptance. The motivation was tested as a mediation variable in other studies to determine whether motivation would affect the complexity and strength of the relationships between variables. This, therefore, informs the option of evaluating the mediating influence of motivation: Motivation mediates the relationship between awareness, accessibility, perceived organizational support perceived organizational support and technology acceptance in another research area. This research aims to investigate the role of motivation as a mediating variable in the relationship between awareness, accessibility, POS and ICT adoption in the field of agricultural extension in the North-East, Nigeria.

The extension delivery system in Nigeria, like other countries in Africa, is generally faced with myriads of problems due to some of the factors responsible for deficiency in the use of ICT in agriculture. The identified factors include lack of adequate trained extension agents, lack of participants' (farmers and extension staff) awareness, lack of organizational support, lack of communication strategies as well as lack of access to the ICT tools (Adekoya, 2016).

Several studies (e.g. Sennuga *and* Fadiji, 2020; Adekoya and Ajayi, 2016; Dire *et al*., 2016; Yakubu *et al*., 2013) on ICT awareness, ICT access, ICT adoption, ICT relevance, and organizational support perception of agricultural extension agents, but none of the studies try to correlate the various relationships between the variables (awareness, accessibility, perceived organizational support and adoption of ICT). However, no study was conducted in the study area to determine the mediation role of motivation in the relationships between awareness, accessibility, perceived organizational support, and adoption of ICT's. Even though the previous studies revealed an interesting outcome concerning the relationship between moderation and mediation effects, none of such studies was able to use powerful tools such as Structural Equation Modelling (SEM) to arrive at evidence-based findings and conclusions (Umar *et al*., 2017). Similarly, an earlier study in North-East Nigeria on Awareness of Agricultural Extension Agents has recommended the need for further studies on various relationships between awareness, accessibility, and adoption of ICT among extension agents (Dire, 2016). The research gap identified within studies on ICT adoption among the extension agents in the North-East geo-political zone in Nigeria formed the basis of the present study.

According to Food and Agriculture Organization (FAO) (2015), ICT can remedy the current challenges that confront public extension systems. Considering the problems surrounding the ICT with regards to agricultural extension services, it becomes imperative to delve into investigating the mediation role of motivation in the relationships between awareness, accessibility, perceived organizational support, and adoption of ICT among the extension agents in north-eastern Nigeria and came up with better-recommended policies that will help the system.

Among the objectives of the present study were to: (1) Measure the socio-demographic characteristics of respondents, (2) To clarify

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the relationship between awareness, accessibility, perceived organizational support, motivation, and adoption of ICT among the respondents, and (3) To examine the mediation role of motivation in the relationships between awareness, accessibility, perceived organizational support and adoption of ICT's.

The Hypotheses

H_{O1}: Awareness has a significant influence on ICT adoption.

H_{O2}: Accessibility has a significant influence on ICT adoption.

H_{O3}: Perceived organizational support has a significant influence on ICT adoption.

H_{O4}: Motivation has a significant influence on ICT adoption.

H_{O5}: Motivation mediates the relationship between awareness and ICT adoption.

H_{O6}: Motivation mediates the relationship between accessibility and ICT adoption.

H_{O7}: Motivation mediates the relationship between perceived organizational support and ICT adoption.

MATERIALS AND METHODS

Research Design

Research design is concerned with the general research plan; it is the data-gathering, review and reporting process (Creswell, 2008). To explore the mediating role of motivation in relations between awareness, accessibility, perceived organisational support and adoption of ICT by extension staff, the present study adopted a descriptive correlational research design. This is because a correlational design is a method of quantitative analysis that quantifies the ties between two or more variables and the use of predictor relationships (Creswell, 2008). Overview of the data was gathered by an investigative tool that enables broader coverage. It also provides a researcher with the ability to obtain comparatively

quickly and without much cost information from a large sample (Ary *et al.*, 2013).

The research framework was developed based on the connection and interconnection among the three theories: Piaget's (1980) Constructivism Theory, Van Dijk's (2009) Digital Divide Theory, and Vroom's (1964) Expectancy Theory. The Constructivism Theory was employed to stand on the relationship between the independent variable (awareness) and the dependent variable (ICT adoption). This is because the theory argues that, for technology to be accepted in a social system, there must have been an awareness of such technology whereby the relationship between awareness and acceptance of technology, as well as the theory, are expanded to serve as a mediator to test the direct and the indirect relationship. The Digital Divide theory stands for accessibility and ICT adoption whereby the theory was also expanded by adding the mediator. The present study incorporates theoretical components of Vroom's (1964) Expectancy Theory to accommodate the role of motivation between POS and the adoption of ICT. This enabled the researcher to examine the mediating role of motivation in the relationship between awareness, accessibility, perceived organizational support and adoption of ICT extension work. Figure 3 below, represents the conceptual framework of the study.

Pilot Study

In research, a pilot study is basically to determine the internal consistency of the research instrument. It is also a small body of study capable of testing the research procedures concerning data collection, instruments, sample recruitment strategies, and other techniques while preparing for large research (Hassan *et al.*, 2006). The reliability of the questionnaires was tested through a pilot study conducted among 30 respondents, who were randomly selected extension agents in Bauchi State, Nigeria, with the pre-designed questionnaires to evaluate the reliability of the survey instrument. In the final stage of data

Table 1. Reliability Statistics (Cronbach's Alpha) according to variable.

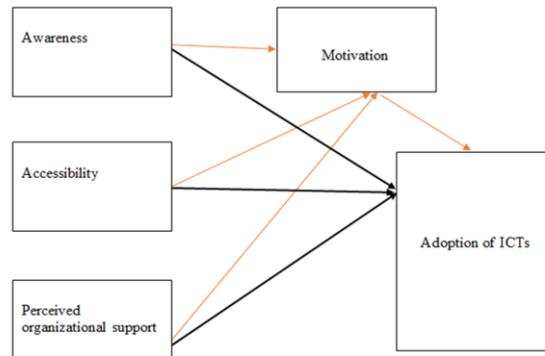| Variable	Number of items	Cronbach's Alpha
Adoption	13	.700
Awareness	12	.802
Accessibility	10	.789
Perceived organizational support	10	.822
Motivation	12	.703

Figure 1 . Conceptual framework of the study showing the relationship between the independent variables, the mediating variable and the dependent variable.

collection, the extension agents who participated in the pilot study under the Bauchi State were excluded from the survey.

Reliability

A reliability analysis using Cronbach's Alpha was carried out for each scale. In this study, the Cronbach's Alpha coefficient values were all above 0.7, which meant that there was high consistency among items and could be concluded that the model was fit for this study. For this reason, no further modification was made to the questionnaire used for the main data collection. The reliability statistics results for the study are presented in Table 1.

Test for Normality

To check whether the data were normally distributed or not, a test of normality using Skewness and Kurtosis was conducted using SPSS version 23 software. The Skewness value of -2 to +2 and the Kurtosis values of -7 to +7 are the acceptable range of construction

objects in the measuring model to be standard (Byrne, 2009). The results of the test conducted on all the individual items (awareness, accessibility, perceived organizational support and motivation) in the model revealed that the Skewness and Kurtosis values were within the range of normal distribution. It was assumed that the data were approximately normally distributed in terms of Skewness and Kurtosis. Table 2 illustrates the results.

Discriminant Validity

The discriminant validity is characterised

Table 2. Normality of the variables.

Variable	Skewness	Kurtosis
Accessibility	-0.613	0.182
POS	0.734	0.133
Awareness	0.014	-0.351
Motivation	-0.311	-0.432
Age	0.104	-0.192
Gender	-0.533	0.232
MStatus	-0.466	-0.332
WExp	-0.151	0.018
Educ	0.104	-0.194

as the degree to which a specific construct clearly differs from other constructs (Hair *et al*., 2010). Proof of discriminatory validity is given when a construct is discovered to uniquely capture those phenomena that do not require other steps. The CFA offers forms in which discriminant validity can be evaluated. A test comparing the Average Variance Extracted (AVE) values for any two constructs with the squared correlation is, however, one way that is mostly used in conjunction with SEM models. Projections between these two models (Hair *et al*., 2010). The AVE estimate should be greater than the squared correlation estimate as proof of discriminating validity. According to Hair *et al*. (2010), this logic is predicated on the idea that a latent construct can explain greater variation in item measures that it shares with another construct. When the 10 square correlations were correlated with individual construct AVE values, the 5 constructs involved in this analysis were found to be of strong discriminant validity. Table 3 displays the AVE values, correlations and square correlations of the constructs.

Composite Reliability

The convergent validity indicator is the reliability coefficient that is concerned with accuracy in measuring whatever you measure (Ary *et al*., 2010). However, the Composite Reliability (CR) value of the constructs involved in the analysis was used as a measure of reliability in this study.

Composite reliability is determined for each construct from the squared total of factor loading and the sum of a construct's error variance word. Hair *et al*. (2010) found that 0.0 and 0.7 are appropriate, but 0.7 and above indicate good reliability. High reliability of constructs is an indicator of internal accuracy, which means that the measurements are reliable in describing the latent construct for which they are to be evaluated. The CFA description for construct validity (AVE and CR) of the

construct used for the study's measurement and structural model is shown in Table 4.

Based on Table 4, the ICT Adoption constructs comprises 13 items, in which, as a result of first order analysis, 5 items were dropped for better model fit. Thus, 8 items represent the construct of ICT adoption for further analysis. The AVE value for ICT adoption is 0.82, which falls above the minimum recommended cut-off value of 0.5. Likewise, Table 4 further indicated that CR value for ICT adoption is 0.922, which means that the construct is reliable.

Awareness was represented by 6 items, where 6 items were dropped which fit indices shows that the model fit the data well. Also, the AVE value of the construct (0.80) indicated good convergence of the items of the construct. Moreover, the construct was found consistently reliable as shown by the obtained CR value of 0.76. Accessibility has initial items of 10 constructs, based on the recommendations of the modification indices the 4 constructs were deleted, allowing the 6-fit construct for the analysis. Also, the AVE for the construct is 0.85, which indicates high convergence of the items on the constructs. The reliability of the construct as shown by the CR value is 0.914, indicating high consistency. Perceived Organizational Support (POS) has 10 constructs in which 4 constructs were eliminated during the CFA process leaving 6 constructs that fit the data. The AVE value (0.83) of the construct has shown high convergence while the CR value of 0.910 indicates high reliability and consistency of the construct. Finally, the results of CFA conducted on motivation, as shown in Table 4 above has shown that the construct was represented by 12 items, after the first step of CFA the model did not fit the data well, as indicated by the fit indices. As such, based on the modification indices, the items were reduced to 6, which indicate a good model fit as shown by the fit indices. Therefore, the 6 items were found to converge on the construct as evidenced by the AVE value of 0.84. Moreover, the

Table 3. The study constructs AVE values, correlations and squared correlations.

S/N	Construct	AVE [a]	1	2	3	4	5
1	ICT Adoption	0.82	1				
2	Awareness	0.80	0.05 **(0.0025)** [b]	1			
3	Accessibility	0.85	0.05 **(0.0025)**	0.30 **(0.09)**	1		
4	POS	0.83	0.10 **(0.01)**	0.01 **(0.01)**	0.03 **(0.0009)**	1	
5	Motivation	0.84	0.09 **(0.0081)**	-0.11 **(0.0121)**	0.05 **(0.0025)**	0.04 **(0.0016)**	1

[a] Average Variance Extracted, [b] Figures bolded in parenthesis indicate squared correlations.

Table 4. Summary of Confirmatory Factor Analysis (CFA) for construct validity.

	Initial items	Final number of items	Items removed	AVE [a]	CR [b]
Adoption	13	8	5	0.82	0.922
Awareness	12	6	6	0.80	0.859
Accessibility	10	6	4	0.85	0.914
POS	10	7	3	0.83	0.910
Motivation	12	6	6	0.84	0.892

[a] Average Variance Extracted, [b] Construct/Composite Reliability.

construct was found to be highly reliable based on the CR value of 0.892.

Convergent Validity

Ary *et al.* (2010) opined that the intent of convergent validity is for researcher to demonstrate that the intended construct is what the items claimed to be the indicators of the construct measured. It was described as a set of items of indicators that are believed to measure a particular construct. (Kline, 2005). Similarly, Hair *et al.* (2010) observed that the "Items that are indicators of specific construct should conver or share a high proportion of variance in common". Relative amount of convergent validity among items measured is estimated through different ways of estimating the amount of convergent validity were identified thus; these are: (i) Factor loadings, (ii) Average Variance Extracted (AVE), and (iii) Construct (or Composite) Reliability (CR) (Hair *et al.*, 2010).

Average Variance Extracted (AVE)

The square of factor loading called variance extracted represents how much variation in the item is explained by the latent construct. In this study, Average Variance Extracted (AVE) for each latent construct were determined. AVE is a summary of indicators of convergence, and it is estimated as a mean variance extracted for the item loading on a construct (Kline, 2005; Hair *et al.*, 2010). It is calculated using standardized loadings, as the total of all squared standardized factor loadings (squared multiple correlation) divided by the number of items. Hair *et al.* (2010) suggests that AVE of 0.5 above indicates adequate convergence, while AVE less than 0.5 indicates that, on average, there are more errors in the items than variance explained by the latent construct. In this study, an AVE of measure for each latent construct was computed and fell within the acceptable values as indicated on Table 5.
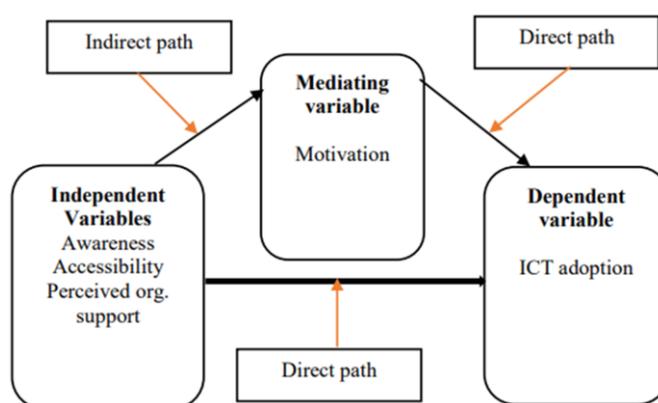
Figure 3. Showing the mediation role of motivation between the independent variables and the dependent variable.

Sampling Techniques

To select the sample for the present study, the multi-stage cluster, as well as stratified sampling techniques, were adopted. Seven hundred and fifty-one (751) extension agents from the six (6) states that made up the North-East zone of Nigeria formed the population of the present study, out of which three states (Adamawa, Gombe and Taraba) were randomly selected, and the sample size of 254 drawn represents the entire population (Krejcie *and* Morgan, 1970). (Figure1, Table5)**.**

Analytical Technique

Structural Equation Modelling (SEM) using AMOS was employed to examine the mediating role of motivation in the relationship between awareness, accessibility, perceived organizational support and adoption of ICT's and to test the hypothesis of the study.

Mediation Analysis

The structural model for this study also depicts the mediation model in which an attempt was made to determine the interaction effects of the mediating variable in the relationship between independent on dependent variables.

RESULTS AND DISCUSSION

Respondents' Characteristics

The results from Figure 4 show that most of the extension agents (94.1%) were males and 5.9% were females. The respondents age distribution indicated that majority of the respondents (77.1%) were between the ages of 31-50 years old. While respondents who were between the age range of 21-30 represent 13.8%, those who attained 50 years and above represent 9.1% respectively, whereas the respondents' median age was 41 years. The agricultural extension agents' marital status indicates that the majority (85.8%) of them were married men and women, 5.5% were divorced, 4.7% single and 3.9% were widows. Approximately, 54.7 and 41.7% of the agricultural extension agents obtained the Nigeria Certificates in Education (NCE)/Ordinary National Diploma (OND), and Higher National Diploma (HND), respectively. Similarly, while 3.5% had Bachelor degrees, none with a higher degree such as Masters or PhDs. While the majority (50.4%) of respondents had 15 to 23 years of work experience, 3.5% of respondents had less than 2 years of work experience. Similarly, 3.5% had 3 to 6 years

of work experience and 35% of respondents had 7 to 10 years of extension work. This is in addition to the 5.5% of the respondents who had 11 to 14 years of work experience. The findings in the present study are in line with Ramli *et al.* (2019), Umar *et al.* (2019), as well as Man and Isah (2019).

Direct Relationship

The exogenous construct (awareness, accessibility, POS) has a direct positive effect on the endogenous construct (ICT adoption). Such direct relationship paths are illustrated in Figure 5. An R^2 value of 0.23 implies that the model explained 23% of the variation in ICT adoption. The standardized regression weights and level of significance were shown in Table 3 above. From the results of the direct effect, the model reproduced in Table 3, awareness and ICT adoption has positive and significant (P< 0.001) influence on ICT adoption. This shows that awareness is vital to ICT adoption among extension agents. Ali *et al.* (2018), Muktar *et al.* (2019) argue that one of the key reasons for the low yield reports by many Nigerian farmers, as well as the output of agricultural extension agents in their duties, is lack of knowledge or

exposure of the farmers to adequately disseminate agricultural information needed. The finding in the present study is in line with Hassan *et al.* (2019), Azman *et al.* (2014) who discovered that awareness predicts ICT adoption among extension agents.

This is also in agreement with constructivist theory by Piaget (1980) who reiterates that the awareness of information and communication technology leads to the adoption of such technology. Therefore, there is a need to enhance the level of awareness among the extension agents for increased ICT adoption in various aspects of extension work. Likewise, accessibility has a positive significant (P< 0.012) influence on ICT adoption support. Such findings imply that accessibility has a significant contribution to ICT adoption among the extension agents in northeast Nigeria. The ability of ICT to make agricultural expansion even more competitive in developing countries seems unassailable in Nigeria (Saleh *et al.* 2017; Omotayo, 2005). The findings of the present study are, therefore, in harmony with Anderson and Feder (2016), Salau and Saingbe (2008), Omotayo (2005) who discover that having access to technology leads to the adoption of such technology. Similar discoveries were made in Van Dijk digital Divide Theory
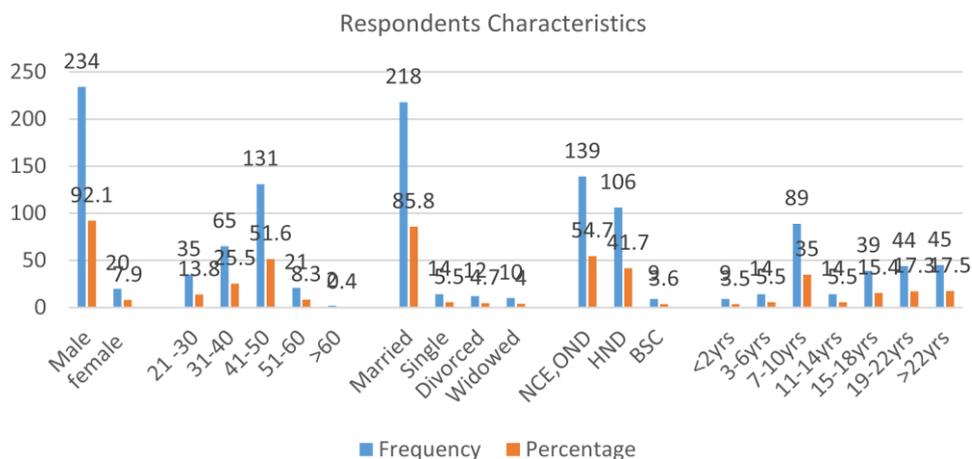

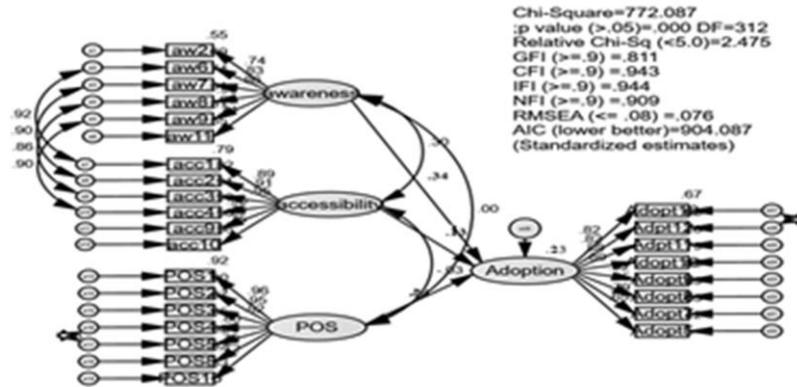**Figure 4.** Showing demographic profiles of the respondents.

Figure 5. Showing the direct relationships between the independent variables and the dependent variable.

(2009) who stresses the relationship between access to technology and the adoption of such technology. In another development, perceived organizational support was found to have a positive and significant (P<0.000) influence on ICT adoption. This implies that POS has a significant influence on ICT adoption in the study area. Eisenberger *et al*. (1986) describe a connection between employee preferences, benefits, and the employee's commitment to the business during an exchange relationship, which indicate that there is an expectation of compensation. The award does not need to be material or automatically received. However, the reward may be an encouragement, appreciation for the commitment and the feeling that they have performed positively or performed efficiently within the norms of the organization's culture. This shows that positive contribution received by extension agents from an organization aids employees' performance.

Mediating Effects of Motivation

The final model has an R2 of 0.47 indicating that 47% of the variation in ICT adoption was explained by the model. This is a substantial improvement in the direct model, which explains only 23% of the variation. The illustrated output of the analysis conducted using IBM AMOS Graphics is shown in Figure 6.

Before any mediation can be established, there has to be the effect of the mediator on the dependent variable. As indicated in Table 4, motivation has a positive and significant (P< 0.023) influence on ICT adoption. This aligns with the theoretical foundation of the present study argues that motivation influences the decision to adopt ICT in extension work by the extension agents. With this, Azman *et al*. (2014), Saleh *et al*. (2016), Saleh and Man (2017), Umar *et al*. (2017) claim that motivation is

Table 6. Regression paths in the direct effect model.

Hypothesized relationships			β	SE	CR	P	Decision
ICT adoption	<---	Awareness	0.341	0.050	4.322	0.000	Supported
ICT adoption	<---	Access	0.233	0.046	2.212	0.012	Supported
ICT adoption	<---	POS	0.244	0.052	3.543	0.000	Supported

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positively related to ICT adoption, hence, the more motivated the extension workers, the easier the adoption of ICT in extension work. Apart from establishing the effect of the mediator on the DV, there are other criteria necessary for confirming the existence and type of mediated relationship (Awang, 2016; Hair *et al*., 2014). One of these is that the antecedent variables must have a significant effect on the outcome variable even before the introduction of the mediator variable. Consequently, the mediation role of motivation in both relationships was established.

Mediation Effect of Motivation on the Relationship between Awareness and ICT Adoption

The mediation effect of motivation in the relationship between awareness and ICT adoption was established. Apart from the significant relationship in the direct model, all the three paths of interest in the model (awareness–adoption, awareness-motivation, and motivation-adoption) were significant. As shown in Table 8, the effect of awareness on ICT adoption was reduced from 0.341 in the direct model to 0.161 in the mediated model. However, the relationship remains significant. This implies that there is partial mediation of motivation on the relationship between awareness and ICT adoption. The results of the present study support the

previous research (Ali *et al*., 2018; Man *and* Isah, 2019; Muktar *et al*., 2019; Umar *et al*., 2017) that revealed that motivation mediates the relationship between awareness and ICT adoption. The results also imply that, in addition to the effect of awareness on ICT adoption, there is an enhanced relationship among the well-motivated extension agents. Hence, the combination of the two factors produces a higher impact in the form of an increased rate of ICT adoption in extension work by the concerned agents. Extension organization agencies, therefore, should note that even when extension agents are aware of ICT usage in extension work, motivation could significantly enhance their ICT adoption in extension work. The model also indicates that the interrelationship among concepts are important in determining the performance of extension agents, even if the individual concepts are considered separately.

Mediation Effect of Motivation on the Relationships between Accessibility and ICT Adoption

The mediation effect of motivation in the relationship between accessibility and ICT adoption was also established due to the significant relationship in the direct model. All the three paths of interest in the model (accessibility–adoption, accessibility-motivation, and motivation-adoption) are
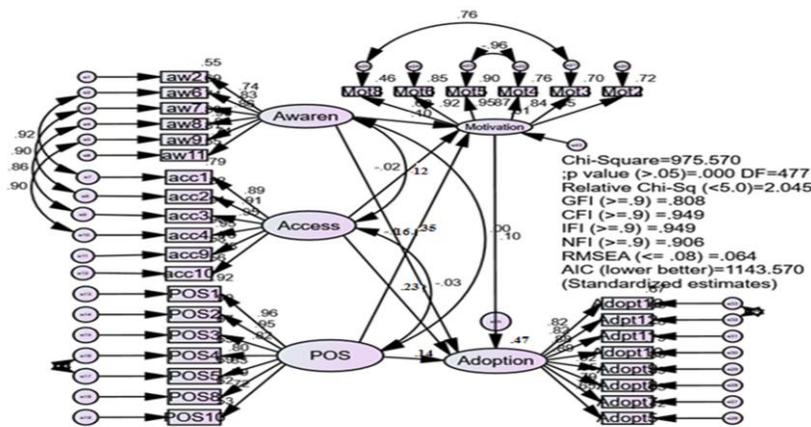

Figure 6. Structural model.

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Table 7. Regression weights in the mediated effect model.

Hypothesized relationships			β	SE	CR	P	Decision
Motivation	<---	Awareness	0.101	0.052	2.429	0.031	Supported
Motivation	<---	Access	0.123	0.053	2.249	0.022	Supported
Motivation	<---	POS	0.352	0.045	4.121	0.000	Supported
Adoption	<---	Motivation	0.503	0.049	2.543	0.023	Supported
Adoption	<---	Awareness	0.161	0.050	2.917	0.057	Supported
Adoption	<---	Access	0.133	0.091	3.227	0.000	Supported
Adoption	<---	POS	0.141	0.044	0.141	0.042	Supported

significant. As indicated in Table 9, the effect of accessibility on ICT adoption was reduced from 0.233 in the direct model to 0.133 in the mediated model, although the relationship remained significant. This shows that there is partial mediation of motivation on the relationship between accessibility and ICT.

The results also support the findings in Ali *et al.* (2020), Hassan *et al.* (2019), and Zulqarnain *et al.* (2020), which indicate that, in addition to the effect of accessibility on ICT adoption, there is an enhanced relationship among more motivated extension agents. Hence, the combination of the two factors produces a higher impact in the form of an increased rate of ICT adoption in extension work by the extension agents. The extension organization agencies should therefore note that, even when extension agents have access to ICT tools in extension work, motivation could significantly enhance their ICT adoption in extension work. The model also indicates that interrelationships among concepts are important in determining the adoption of extension agents, even as the individual concepts are considered separately.

Mediation Effect of Motivation on the Relationship between POS and ICT Adoption

The mediation effect of motivation in the relationship between POS and ICT adoption was established. Apart from the significant relationship in the direct model, all the three paths of interest in the model (POS-adoption, POS-motivation, and motivation-adoption) were significant. As shown in Table 10, the effect of POS on ICT adoption was reduced from 0.244 in the direct model to 0.141 in the mediated model. However, the relationship remained significant. This indicates that there is partial mediation of motivation on the relationship between POS and ICT adoption. This is in agreement with the previous studies (Ali *et al.*, 2018; Man and Isah, 2019; Muktar *et al.*, 2019; Umar *et al.*, 2019) that discovered an intervening role of motivation in the effect of POS and ICT adoption. This model proved that motivation plays a mediating role between POS and ICT adoption. Therefore, attention should be given to both concepts and the various interactions during policy planning that will ensure extension agents perceived support from their organization that would lead to the adoption of ICT tools in extension work. In addition, the findings also imply that, even when extension agents perceived that their organization may not likely support them, they need to be motivated as well. When the two aspects are combined, the ICT adoption in extension work by the extension agents would be enhanced.

Table 8. Mediation effect of motivation on the relationship between awareness and ICT adoption.

Model	Construct	Beta	P
Direct model			
	Awareness → ICT adoption	.341	.000
Mediated model			
	Awareness → ICT adoption	.161	.057
	Awareness → Motivation	.101	.031
	Motivation → ICT adoption	.503	.023

Table 9. Mediation effect of motivation on the relationship between accessibility and ICT adoption.

Model	Construct	Beta	*P*
Direct model			
	Access → ICT adoption	.133	.000
Mediated model			
	Access → ICT adoption	.233	.000
	Access → Motivation	.123	.022
	Motivation → ICT adoption	.503	.023

Table 10. Mediation effect of motivation on the relationship between POS and ICT adoption.

Model	Construct	Beta	P
Direct model			
	POS → ICT adoption	0.244	0.000
Mediated model			
	POS → ICT adoption	0.141	0.042
	POS → Motivation	0.452	0.000
	Motivation → ICT adoption	0.503	0.023

Table 11. Decisions on the hypotheses tested.

Model	Hypothesis	Beta	P	Decision
Direct model				
	Awareness → ICT adoption	0.341	0.000	Supported
	Access → ICT adoption	0.233	0.000	Supported
	POS → ICT adoption	0.244	0.000	Supported
Mediated Model				
	Motivation → ICT adoption	0.503	0.023	Supported
	Awareness → ICT adoption	0.161	0.000	Supported
	Access → Motivation	0.133	0.022	Supported
	POS → ICT adoption	0.244	0.141	Supported

Decision on Hypothesis

Table 11 shows the various hypotheses tested in this study and the decisions reached based on the structural model. A total of seven hypotheses were tested and all of them were supported.

From the results of the direct effect model (Table 11) awareness and ICT adoption has positive and significant (P< 0.001) influence on ICT adoption. Therefore, hypothesis Ho$_1$ is supported. This implies that awareness is vital to ICT adoption among the extension agents. Likewise, accessibility has positive significant (P< 0.012) influence on ICT adoption, which supports the hypothesis H0$_2$. The findings imply that accessibility has a significant contribution to ICT adoption among the extension agents in northeastern Nigeria. Similarly, perceived organizational support

was found to have positive and significant (P<0.000) influence on ICT adoption. Hence, hypothesis Ho$_3$ is supported. This means that POS has a significant influence on ICT adoption in the study area.

Similarly, in the mediated model, motivation has positive and significant (P< 0.023) influence on ICT adoption. Therefore, hypothesis Ho$_4$ stands supported. Mediation effect of motivation in the relationship between awareness and ICT adoption was established because, apart from the significant relationship in the direct model, all the three paths of interest in the model (awareness – adoption; awareness-motivation; and motivation-adoption) are significant. Also, as shown in Table 11 the effect of awareness on ICT adoption was reduced from 0.341 in the direct model to 0.161 in the mediated model. However, the relationship remained significant. This indicates that there is partial mediation of motivation on the relationship between awareness and ICT adoption and hypothesis Ho5 is supported. The mediation effect of motivation in the relationship between accessibility and ICT adoption was also established because, apart from the significant relationship in the direct model, all the three paths of interest in the model (accessibility – adoption; accessibility-motivation; and motivation-adoption) were significant. The effect of accessibility on ICT adoption was reduced from 0.233 in the direct model to 0.133 in the mediated model. However, the relationship remained significant. This indicates that there is partial mediation of motivation on the relationship between accessibility and ICT adoption and hypothesis Ho6 is supported. Conversely, the mediation effect of motivation in the relationship between POS and ICT adoption was established as well, apart from the significant relationship in the direct model, and all the three paths of interest in the model (POS–adoption; POS-motivation; and motivation-adoption) were significant. Also, as shown in Table 11, the effect of POS on ICT adoption was reduced from 0.244 in the direct model to 0.141 in the mediated model.

However, the relationship remained significant. This indicates that there is partial mediation of motivation on the relationship between POS and ICT adoption and hypothesis Ho7 is supported.

CONCLUSIONS

The present study focused on examining the mediation role of motivation in the relationships between awareness, accessibility, perceived organizational support, and adoption of ICT's in the northeast Nigeria. The findings revealed that the direct relationship paths showed the direct positive effect of exogenous construct (awareness, accessibility, POS) on the endogenous construct (ICT adoption) with an R^2 value of 0.23. The final model has an R^2 of 0.47 (47%) of the variation in ICT adoption as explained by the model, which is a substantial increase in the direct model, which also explains 23% of the variation. Such revelation signifies that the mediation effect of motivation in the relationships between awareness, accessibility, POS, and ICT adoption was also established, indicating a partial mediation. The practical and theoretical implication of the present study was to confirm, contribute, and expand Piaget's (1980) Constructivism Theory, as well as Van Dijk's (2009) Digital Divide Theory, especially through the addition of mediation role of motivation and testing/applying it on the extension agents. Furthermore, the study expanded Vroom's (1964) Expectancy Theory by adding the ICT adoption and applying it to the field of extension, as well as the contribution of awareness, accessibility, and POS to the adoption of ICT's in extension service delivery. Finally, the study recommends that extension organizations should be mindful of the motivation levels of their employee. By so doing, it would facilitate the adoption of ICT in extension work, which will no doubt facilitate the timely delivery of extension messages, cover the manpower shortages,

cost reduction, and total transformation of agricultural development in the affected area.

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نقش میانجیگری انگیزه در روابط بین آگاهی، دسترسی، و حمایت سازمانی ادراک شده با پذیرش فناوری اطلاعات و ارتباطات(ICT) در میان مروجین کشاورزی در شمال شرق نیجریه

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چکیده

هدف از این پژوهش بررسی نقش میانجیگری انگیزه در روابط بین آگاهی، دسترسی، حمایت سازمانی درک شده با پذیرش فناوری اطلاعات و ارتباطات (ICT) بود. داده‌ها با استفاده از روش نمونه‌گیری خوشه‌ای چند مرحله‌ای با پرسشنامه‌ای که برای ۲۵۴ پاسخ‌دهنده اجرا شد، بهدست آمد. هرچند که از مدل سازی معادلات ساختاری برای تجزیه و تحلیل استفاده شد، نظریه سازه انگاری (Constructivism Theory)، نظریه شکاف دیجیتال(Digital Divide) و همچنین نظریه انتظار وروم (Vroom's Expectancy Theory) هم در این مطالعه به کار رفت. اکثر پاسخ دهندگان مرد، متاهل و در میانسالی با سابقه کاری طولانی بودند که دیپلم دبیرستان یا لیسانس را نیز داشتند. مسیرهای ارتباط مستقیم نشان داد که سازه برونزا (آگاهی، دسترسی،

حمایت سازمانی درک شده–(POS)) تأثیر مثبت مستقیمی بر ساختار درون زا (پذیرش فناوری اطلاعات و ارتباطاتICT) با مقدار R^2برابر ۰/۲۳ یا (۲۳٪) داشت. مدل نهایی دارای R^2برابر ۰/۴۷ یا(۴۷٪) از تغییرات پذیرش فناوری اطلاعات و ارتباطات است که افزایش قابل توجهی در مقایسه با آنچه با مدل مستقیم توضیح داده شده (۲۳٪) دارد . اثر میانجیگری انگیزه در روابط بین آگاهی، دسترسی، POS و پذیرش ICT نیز مشخص شد که نشان دهنده میانجیگری جزئی است.نتایج این پژوهش توصیه می‌کند که سازمان‌های ترویج باید از سطح انگیزه کارکنان خود برای پذیرش فناوری اطلاعات و ارتباطات در کارهای ترویجی آگاه باشند، چرا که این امر باعث تسهیل در انتقال به موقع پیام‌ها، پوشش کمبود نیروی انسانی، کاهش هزینه‌ها و همچنین تحولی کلی در توسعه کشاورزی در منطقه می‌شود.

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