

Determinants of professionalisation of extension service delivery: A confirmatory factor analysis approach

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ABSTRACT

The need for agricultural extension services in Nigeria to attain a higher ethical and professional status of registering and certifying its service providers like other disciplines for effective service delivery has led this study to examine the factors influencing extension professionalisation in Nigeria. 356 extension agents from both public and private extension organisations were selected through a two-stage sampling procedure. A structured questionnaire was used to elicit information on the knowledge, attitude and perceptions on the effects of the components of professionalisation (i.e. accreditation, registration, and certification) on service delivery. The Cronbach alpha reliability values for the constructs used in the different sections of the instrument were knowledge (0.78), attitude (0.94), accreditation (0.92), registration (0.89) and certification (0.96). Data was analysed using IBM AMOS version 24 to conduct a confirmatory factor analysis to determine the interrelationships that exist between the extension agent's knowledge, attitude, and the components of professionalisation. The findings revealed a significant and strong positive correlation between the constructs of the extension agent's knowledge, attitude and the professionalisation components of accreditation, registration, and certification. These findings have implications for educating and training extension agents on professionalisation and its components to ensure its institutionalisation in the agricultural extension sector for the provision of a more ethical, competent, accountable, and efficient rural and advisory service delivery.

Keywords: Confirmatory factor analysis, extension services, ethics, professionalisation, Nigeria

1. INTRODUCTION

Globally, agricultural extension remains very important in providing knowledge, skills, and advisory services to farmers for the improvement of agricultural productivity (Ragasa *et al.*, 2016). This makes agriculture development in many countries including Nigeria dependant on a viable,

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effective, and vibrant extension services. Nigeria probably has the most elaborate extension system in Sub-Saharan Africa (SSA) (Musa, Aboki & Audu, 2013) and this is expected to facilitate a dynamic and sustainable approach to agricultural development within the country (Akinagbe & Ajayi, 2010). However, over the years, there has been growing concern about the performance of extension practitioners and the services rendered which has been said to be inefficient and unsatisfactory (Ayansina, 2011; Adekunle, 2013).

There have been incessant complaints by farmers and other stakeholders about poor extension service delivery resulting from poorly trained personnel, poor linkages in the innovation system and in general poor work ethics (Oladele, 2011; Obiora & Emordi, 2013; Anaeto *et al.*, 2015). Additionally, global public investment in extension has generally declined because donor agencies that often support governments investment in extension services with funds and loans have shown increasing concern on the decreasing rate of returns on investments made in extension (World Bank, 2006). All these bring about inefficiency and confusion around the effort to transfer agricultural knowledge to farmers. Extension practitioners are said to be unresponsive to farmer's needs, unaccountable for services rendered, not liable for unethical conduct, prone to incorrect and wrong message dissemination and in general inefficient service delivery.

Over the years, several reforms have been introduced into the extension systems approaches, models and methods as part of attempts to overcome these highlighted problems without the desired impact. However, as advocated by Zwane (2014) and Oladele (2011), the institutionalisation of proper policy framework, which outlines the guiding principles for service delivery and the professionalisation of extension services involving the accreditation, registration and certification, remains an indispensable way to enhance competence, good work ethics, integrity, accountability, and efficient service delivery. This is in-line with the mandate of the Global Forum for Rural Advisory Services (GFRAS) whose strategy to revitalise agricultural extension, is by ensuring that countries have legislated extension policy and that there is professionalisation of extension service providers (GFRAS, 2012; Davis, 2015).

This is predicated on the fact that most of the problems associated with extension service delivery in many African countries do not occur in European countries such as Germany, Netherlands and Belgium due to the professionalisation of agricultural extension services which involves registration, accreditation and certification (Terblanche, 2007). This continuous process of professionalisation in Europe is evident as pointed out by Waldmeier (2012) who reported a recent initiative by the International Academy of Rural Advisors (IALB), which was to ensure that European rural consultants and farm advisors are re-trained and certified so as to make sure they acquire methodical, ethical, communicative, social and personal skills for the exhibition of professional behaviour in their advisory roles towards their clientele.

2. LITERATURE REVIEW

The concept of professionalism in agriculture according to Van Der Wateren (1990) is that professionalism is usually earned on account of competence and being properly qualified to execute the desired functions. Critical analyses of professionalism usually explore the value of the

service offered by the members of an occupation. Hoyle (2001) explained professionalism as an enhancement of the quality of services rendered while Boyt, Lusch and Naylor (2001) emphasize professionalism as involving the attitudinal and behavioural orientation one possesses towards one's occupation. Professionalism goes beyond having extraordinary mastery over knowledge and skills of a subject matter. It has to do with character, attitude, striving for excellence, competence, behavioural integrity as well as ethical conduct (Reedthe Goals Institute, 2011). Therefore, in extension service, professionalism is evident when expertise in terms of knowledge and skills combines with integrity and ethics resulting in a competent, highly capable, committed and responsive extension practitioner. Professionalism is mainly said to be in two forms or dimensions which are organisational and occupational professionalism (Evetts, 2009). Organisational professionalism, which is most relevant to extension services in Nigeria, is basically facilitated through the accreditation, registration, certification, and continuous training of employees (Evetts, 2009).

Terblanche (2015) stated that professionalisation of extension services is to enhance the image, promote credibility and accountability in the extension profession, regulate the professional conduct of extension personnel and ensure the competence of extension agents through their accreditation and registration with a recognised and credible professional body. Accreditation, registration and certification are all processes that ensure that an individual, having gone through the prescribed standard of education for a profession, passed the necessary qualifying exams and/or met the minimum experience, is given the right to practise in a profession by a professional society or specialised board or body. This implies that everyone who performs the duties of agricultural extension and advisory services needs to demonstrate the attributes of professionalism.

It could be summarised from the reviewed literature that professionalisation of extension services refers to the process of setting up policies and structures that will ensure that extension and advisory services are carried out by a certified, legitimate, registered, and accredited community of individuals with similar knowledge, skills and expertise characterised by commonly-held norms, values and regulation as well as the exhibition of the highest level of integrity, competence and ethical conduct underpinning the practice. As indicated by the International Fund for Agricultural Development (IFAD) (2001), professionalisation will add greater integrity, flexibility and authority to extension agents. Terblanche (2015) reported that countries such as South Africa and Ghana have taken the lead in Africa in implementing the GFRAS mandate of professionalisation and the same would soon be applied in Nigeria to unlock the extension sector for accountability, ethical conduct and efficient service delivery. Thus, the focus of this study is to determine the factors that influence extension agents perceived effects of extension professionalisation using confirmatory factor analysis.

3. METHODOLOGY

The study was carried out in Southwest Nigeria, a zone known for its elaborate system of extension organisations and high concentration of extension activities (Oladele & Fawole, 2007). The study population consists of extension agents in both public and private extension organisations within the zone. A two-stage random sampling technique was used in the selection of the extension

agents. First, was a selection of three states in the Agricultural Development Programme (the hub of public extension organisation in Nigeria), namely Oyo, Osun and Ogun State, ADPs out of the six in the zone and a selection of two agro-based Non-Governmental Extension Organisations, namely Farmers Development Union (FADU) and Justice Development and Peace Movement-Rural Development Programme (JDPM-RUDEP) out of the four in the zone. The second stage was a random selection of 301 public extension agents and 55 private extension agents from the lists received from the organisations. The proportionate sample size selected in each organisation was determined by using the Roasoft sample size calculator. Table 1 revealed the summary of the population and study sample selected. Therefore, a total of 356 extension personnel was used for the study.

TABLE 1: Summary of Study Population and Selected Sample

Selected Extension Organisations		Population Size	Proportionate Randomly Selected Sample
Public Extension Org. (ADPs)	Ogun	112	87
	Osun	193	129
	Oyo	108	85
Private Extension Org. (NGEOs)	FADU	23	22
	JDPM	35	23
Total			356

Structural Equation Modelling using the Confirmatory Factor Analysis approach was used in determining the hypothesized model of the inter-relationship that existed between the extension agents constructs of knowledge, attitude and the components of their perceived effects on professionalisation (i.e. accreditation, registration, and certification). The knowledge of the extension agents was computed from a total of 36 items relating to the concept of professionalisation and its components while their attitude was measured as a pooled score from 43 standardised attitudinal statements on professionalisation and its components and rated on a 5-point Likert scale of strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1). Also, the perception of the effect of accreditation, registration and certification was computed from 9, 8 and 9 variables respectively measured on a 4-point Likert scale of greatly improved (4), improved (3), slightly improved (2), not improved (1). The details of all these items were explicitly stated as provided in an earlier publication (Olorunfemi *et al.*, 2020). Structural Equation Modelling is a tool that is used to specify and estimate the effects among measured variables and latent variables. Measured variables represent and serve as indicators of each latent variable (Tutkun, Lehmann & Schmidt, 2006). Four items of knowledge, three items of attitude, three items of accreditation, two items of registration and four items of certification with the highest frequencies were measured, these variables represented and served as indicators of the constructs

of knowledge, attitude, accreditation, registration, and certification used in the analysis. Data were analysed using IBM AMOS Version 24.

4. RESULTS AND DISCUSSION

4.1. Socio-Economic Characteristics of the Extension Agents

The results show that about three-quarters (74.7%) of the extension agents in the study were male and the average age was 41.5 years across the study area which reveals that the agents are generally in their economically active years. This agrees with Akintonde *et al.* (2012) who reported that extension agents in Southwestern Nigeria were young and active. In addition, Ajayi (2013), Arokoyo (2010) and Oladele and Mabe (2010) reported that in Africa there were more males than females in extension services. This is an indication for the need to recruit and inject more females into agricultural extension services in order to assist extension agents to render effective and equally gender related services. The majority (90.4%) of the extension agents were married and were mainly (62.6%) diploma holders. This is in consonance with Olorunfemi *et al.* (2020) who stated that most of the extension agents in Southwestern Nigeria had a level of education above diploma. On average, the extension agents pooled together have been in extension work for 12 years. This conforms to Oladele (2011) who stated that extension agents in Southwestern Nigeria have a high number of years of experience in extension work. Additionally, extension workers in Ghana were reported to have worked for an average of 13 years (Owens *et al.*, 2001) while extension officers in South Africa had a mean of about 14 years working experience (Oladele & Mabe, 2010). This suggests that the working experience in the study area is similar to other countries in Africa where professionalisation has taken place. This attribute is expected to positively enhance their exposure and knowledge on professionalisation. A little above average (57.3%) of the extension agents had a rural background implying that they were born and brought-up in the rural area. This is a good attribute for extension service delivery as agriculture in the study area is predominantly practised in the rural communities and so the agents rural background would have exposed them to the rural terrain, lifestyle and practices thus enhancing their adaptability and effectiveness in carrying out their duties. The results of the extension agent's knowledge revealed that they had basic knowledge about the concept and components of professionalisation. This is in line with Olorunfemi and Oladele (2018) who reported that extension agents in Southwest Nigeria were knowledgeable about the basic intricacies of the concept and process of professionalisation. Moreover, the extension agents exhibited a favourable attitude towards professionalising extension services in the area and country as a whole. Furthermore, the results show that the extension agents had a positive perception of the effects of the components (accreditation, registration, and certification) of professionalisation in improving extension service delivery.

TABLE 2: Socio-Economic Characteristics of the Extension Agents (n = 356)

Characteristics	Summary description
Age	Mean age is 41.5 years
Gender	Predominantly male (74.7%)
Marital status	Predominantly married (90.4%)
Education qualification	Mainly diploma holders (62.9%)
Years of experience	Mean is 12 years
Background	Mainly rural
Knowledge on professionalisation	Had basic knowledge
Attitude towards professionalisation	Favourable attitude
Perception on the components of professionalisation	Positive perception

4.2. Confirmatory Factor Analysis on Factors Influencing Professionalisation

A Confirmatory Factor Analysis (Structural Equation Modelling) was used in determining a five-factor hypothesised model based on theories, previous literature and results of the inter-relationship that existed between the extension agents constructs of knowledge, attitude and the components of their perceived effects of professionalisation (i.e. accreditation, registration and certification). As stated earlier, four items of knowledge, three items of attitude, three items of accreditation, two items of registration and four items of certification with the highest frequencies were measured, variables that represented and served as indicators of the constructs of knowledge, attitude, accreditation, registration, and certification used in the analysis. The details of the variables relating to the items that served as indicators of the constructs are as follows: The constituent of the knowledge construct of the respondents on professionalisation from the four variables revealed that the extension agents attested to the fact that professionalisation entails setting up policies and structures to guide the extension profession (Know-1) and that accreditation, registration and certification are all essential components of the concept (Know-2). They were also knowledgeable about the fact that professionalisation will ensure that only extension agents that have met the required standards are certified to operate (Know-3), and it will propel them to be committed to maintaining currency of their skills (Know-4). The constituent of the attitude construct revealed that their attitude was positive, mainly because of their disposition that professionalisation will improve the image of the extension profession (Att-1), quality of service (Att-2) and increase the general productivity of extension agents (Att-3). The constituents of the construct of the three professionalisation components revealed that the respondents agreed to the fact that accreditation of extension personnel will inject more integrity and ethics (Acc-1), accountability (Acc-2) and global peer acceptance into the profession (Acc-3). Additionally, they basically indicated that the implementation of registration of extension officers will facilitate the identification and tracking of extension personnel identity (Reg-1) and enhance the feedback mechanism in the sector (Reg-2). Finally, they concurred that certification of personnel will

engender service quality (Cert-1), credibility (Cert-2), personnel confidence (Cert-3) and the image of the profession (Cert-4) thus facilitating more job satisfaction.

In order to determine the internal consistency of the items used in the study, the Cronbach alpha reliability values for each construct used in the different sections of the instrument were knowledge (0.78), attitude (0.94), accreditation (0.92), registration (0.89) and certification (0.96). Furthermore, as revealed in Table 3, the KMO and Bartlett's test of Sphericity conducted for the variables suggested that the data is appropriate to be used for the confirmatory factor analysis.

TABLE 3: KMO and Bartlett's Test for the Variables

Variable	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	Df	P-value
Knowledge	0.761	6527.323	630	0.000
Attitude	0.913	9395.732	903	0.000
Accreditation	0.931	1396.851	36	0.000
Registration	0.913	1108.377	28	0.000
Certification	0.912	1656.647	36	0.000

The findings from Table 4 show the confirmatory factor analysis (CFA) results of the relationship between the five constructs of professionalisation used in the study. The model fit indicators reveal that the chi-square statistic of the model is 214.297 and it is significant at $p = 0.01$. This value seems not to indicate a great fit, however, according to Holtzman and Vezzu (2011), this is the general trend as chi-square analysis in SEM is widely seen to be problematic because of its sensitivity to larger sample sizes. Therefore, the indication of a good model fit is preferably based on the utilisation of other goodness of fit indicators.

The X^2/df for the model is 2.280 which is an acceptable fit as the value falls below the upper threshold of 5. The Root Mean Square of Approximation (RMSEA) value for the model is 0.06 and this indicates a good fit as it falls into the proposed range of adequate values (Hair *et al.*, 2010; Hu & Bentler, 1999). Furthermore, the Comparative Fit Index (CFI) is said to be an incremental fit index which evaluates the improvement of a proposed model over an independence model (Byrne, 2013). The CFI value of the model is 0.941 which shows an acceptable fit as it goes beyond the cut-off value of 0.90 (Zaremohzzabieh *et al.*, 2015). Other model fit indicators that were considered are the Goodness of fit index (GFI), Tucker Lewis Index (TLI) and Incremental Fit Index (IFI) whose values are 0.929, 0.925 and 0.942, respectively. All values of these indicators exceed the cut-off point of 0.90 (Hair *et al.*, 2010), thus revealing that the model has displayed a good fit for the data in the study. The entire indicators of the structural model all fall within the

acceptable region, thus showing that the model adequately represented the hypothesised relationship (Brown, 2006; Steiger, 2007; Hair *et al.*, 2010; Zhou & Abdullah, 2017).

TABLE 4: Summary of Model Fit for the Confirmatory Factor Analysis

Model	X ²	X ² /df	AGFI	GFI	CFI	RMSEA	TLI	IFI	AIC
Recommended Index		≤ 3	≥0.90	≥0.90	≥0.90	≤ 0.1	≥0.90	≥0.90	
Default	214.297	2.280	0.898	0.929	0.941	0.060	0.925	0.942	298.297
Independence	2161.225	18.010	0.260	0.347	0.000	0.219	0.000	0.000	2193.225

The findings from Table 5 reveal the unstandardised and standardised estimates (factor loadings) (Figure 1) of the model. The standardised factor loadings of the model are of greater interpretative importance and the square of each individual standard factor loading equals the squared mean correlation of the indicator (R^2_{smc}). Overall, more than half of the standardised loadings have values of $R^2_{smc} < 0.50$ indicating that the model explains the minority of the observed variance for less than half of the indicators making the convergent validity of the factors seemingly doubtful (Kline, 2011). However, as revealed in Table 5, the correlations of the factors show very high and significant correlations between them making the result valid and acceptable.

TABLE 5: Standardized and Unstandardized Coefficient Estimate for Confirmatory Factor Analysis

Observed Variable	Latent Construct	B	SE	*β	R ² _{smc} (*β ²)
Know-1	Knowledge	1.000		0.432	0.19
Know-2	Knowledge	0.820***	0.173	0.425	0.18
Know-3	Knowledge	0.670***	0.183	0.283	0.08
Know-4	Knowledge	0.800***	0.188	0.354	0.13
Att-1	Attitude	1.000		0.501	0.25
Att-2	Attitude	1.315***	0.153	0.733	0.54
Att-3	Attitude	1.234***	0.139	0.820	0.67
Acc-1	Accreditation	1.000		0.670	0.45
Acc-2	Accreditation	1.051***	0.090	0.681	0.46
Acc-3	Accreditation	1.118***	0.092	0.711	0.51
Reg-1	Registration	1.000		0.748	0.56

Reg-2	Registration	0.968***	0.074	0.767	0.59
Cert-1	Certification	1.000		0.540	0.29
Cert-2	Certification	0.975***	0.118	0.562	0.32
Cert-3	Certification	1.422***	0.135	0.858	0.74
Cert-4	Certification	1.201***	0.116	0.825	0.68

B = unstandardised estimate; *β = standardised estimate, SE – Standard error

***** p<0.01**

Given the results of the confirmatory estimate, the following hypotheses were generated.

H_{1a}: There is a significant relationship between the respondent’s knowledge and the components of their perceived effects of professionalisation (i.e. accreditation, registration, and certification).

H_{1b}: There is a significant relationship between the respondent’s attitude and the components of their perceived effects of professionalisation (i.e. accreditation, registration, and certification).

The results of the hypothesis testing of the correlated exogenous constructs of professionalisation using the confirmatory factor analysis in Table 6 and Figure 1 reveal significant and strong positive correlations between the constructs of the extension agents knowledge, attitude, and the components of accreditation, registration, and certification confirming the existence of a relationship between the extension agents knowledge, attitude and the components of their perceived effects of professionalisation (i.e. accreditation, registration and certification) hence the hypotheses were supported. This points out that knowledge and attitude of extension agents are key variables that influence professionalisation of extension services. This implies that as the knowledge and favourable attitude of the agents increases towards the concepts of professionalisation, their perception of the effects it will have on service delivery will also increase. This will thus enhance the process of facilitating the acceptance and smooth implementation of professionalisation on a full scale in the study area.

TABLE 6: Correlation Coefficient Matrices between Latent Variables of the Confirmatory Factor Analysis

Variables	Knowledge	Attitude	Accreditation	Registration	Certification
Knowledge	1				
Attitude	0.605***	1			
Accreditation	0.804***	0.833***	1		
Registration	0.586***	0.691***	0.952	1	
Certification	0.695***	0.796***	0.948	0.819	1

***** p<0.01**

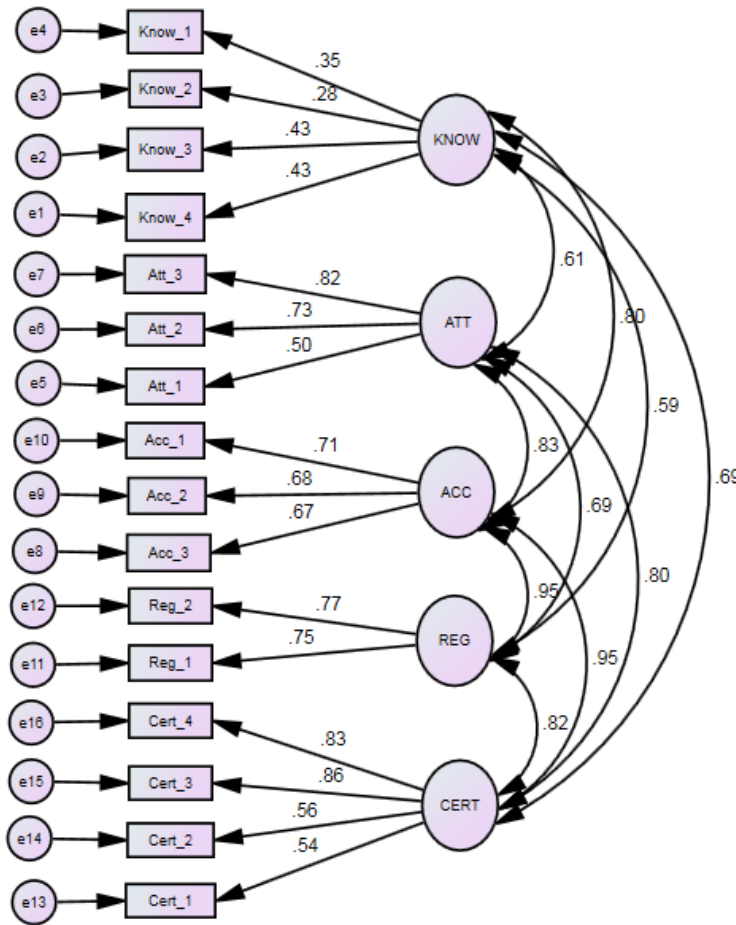


FIGURE 1: Path Diagram of Confirmatory Factor Analysis of the Constructs of Knowledge, Attitude, Accreditation, Registration and Certification

5. CONCLUSION AND RECOMMENDATIONS

Professionalisation is a major key to revitalise, reposition and unlock the extension sector and this study has contributed to the existing literature by shedding light on the fact that extension agents knowledge and attitude were significant factors that determine the professionalisation of extension service delivery. This suggest that having knowledge about the concept and components of professionalisation and a favourable attitude towards the professionalisation of extension services are key influencers that helps to successfully engender professionalisation in the extension sector. These findings have implications for educating and training extension agents on professionalisation and its components of accreditation, registration, and certification in the study area. It points out the necessity to organise more training avenues for extension officers where information about the intricacies and potential benefits of professionalisation will be incorporated in order to ensure its institutionalisation in the agricultural extension sector for the provision of a

more ethical, competent, accountable and efficient rural and advisory service delivery to the society.

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