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Willingness to Pay for Training on Digital Tools among Professionals in Agricultural Institutes in Kwara State, Nigeria

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Abstract

This study assessed the willingness to pay for training on digital tools among professionals in agricultural institutes in Kwara State, Nigeria. Data were collected using a structured questionnaire from 125 professionals who were randomly selected across the chosen organisations based on probability proportion to their faculty staff strength. Data were analysed with descriptive statistics and binomial logistic regression. Results showed that the professionals were aware of, and considered digital tools such as Google meet, Google form, Microsoft teams, Google classroom, Kobo tool box, Google slides, Canva and STATA as important to their jobs. The factors influencing willingness to pay for training on digital tools were age (ß =-0.1212, p<5), gender (ß =0.8293, p<10), educational level (ß =0.2072, p<5) and membership of professional association (ß =1.4171, p<10). The constraints to the use of digital tools in order of severity were inadequate training opportunities, high cost of technologies, poor network connectivity, inadequate funds and poor technical know-how. The study concludes that professionals in agricultural institutes in Kwara State were aware of digital tools and they also considered them as important to their jobs. Age, gender, educational level, and membership of professional association significantly influenced the willingness to pay for training on digital tools. The study therefore recommends that professionals should leverage on their professional associations for more training on digital tools. Also, their organizations should provide more training on digitals tools to their staff while giving special consideration to the female professionals.

Introduction

The use of digital technologies in farming and agribusiness activities is causing a significant revolution in the agricultural sector. More effective and sustainable agricultural systems are needed in light of the growing need for food security as well as issues like population growth, resource scarcity, and climate change. Promising solutions are provided by evolving digital tools (UNDP, 2021; Choruma *et al.,* 2024). Technological and digital innovation are increasingly recognised as central to closing productivity gaps and making agricultural systems more resilient and efficient (Abdulai, 2022).

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The global discourse increasingly positions digital tools, such as mobile advisory services, precision farming tools, geospatial systems, and online market platforms, as catalysts for agricultural transformation These tools have the potential to enhance efficiency, improve decision-making, and connect farmers and agribusinesses across value chains (Klerkx *et al.,* 2019; World Bank, 2023). In the same vein, professionals such as management development officers, research officers, and engineers in agricultural institutes make use of digital tools such as google meet, google form, asana, slido, canva, STATA and google slides for training, research and consultancy services. These digital tools also have the potential to enhance efficiency of their services to the different stakeholders along the agricultural value chain.

Professionals in the agricultural sector such as extension officers, agribusiness advisors, supply-chain managers, input dealers and technical service providers sit at the fulcrum of transformation. Their choices about which digital tools to use, recommend, integrate into advisory workflows, and carry out training for farmers determine whether technologies actually change on-farm practices and outcomes. Empirical studies from Nigeria show that these professionals are increasingly using mobile phones and ICT platforms (Izuogu *et al.,* 2023; Amoussohoui, 2024). Though they also face challenges such as inadequate access to reliable internet, inadequate digital literacy skills, or institutional support to integrate these tools effectively into their operations (Arowosegbe *et al.,* 2024). Digital advisory services have been shown to increase adoption of recommended inputs by 22 % and yields by 4 % in meta-analyses (Fabregas *et al.,* 2019).

Professionals in agricultural institutes and organizations such as Agricultural and Rural Management Training Institute (ARMTI), National Centre for Agricultural Mechanization (NCAM) and Nigerian Stored Products Research Institute (NSPRI) also make use of digital tools in fulfilling their mandates. These agricultural professionals serve as intermediaries between technology providers and farmers and other agricultural stakeholders; their capacity and willingness to use digital tools directly influence the diffusion and impact of agricultural innovations (Fabregas *et al.,* 2019). If these professionals are not effectively utilizing digital tools, the broader vision of digital agriculture as a driver of productivity, resilience, and sustainable growth may remain unrealized in Nigeria.

In order to make the desired impact, it is important for professionals.to build their capacity on digital tools as technologies evolve. This would enable the transfer of knowledge to other stakeholders too from time to time. However, there is limited study on the willingness to pay for training on digital tools among professionals in agricultural institutes in Kwara State. Hence, this study seeks to assess the willingness of professionals to pay for training on digital tools. The specific objectives of the study are to assess the awareness of digital tools by professionals in agricultural institutes; ascertain the importance of digital tools to professionals; identify the constraints to the use of digital tools; and examine factors influencing the willingness to pay for training on digital tools among professionals in agricultural institutes.

Methodology

Study Area

The study was conducted in Kwara State. The state is located within the North central geopolitical zone of Nigeria. It has a land area of about 32,500 square kilometers with a latitude of between 7°45'N and 9°30'N and longitude 2°30'E and 6°35'E. The occupations of the people of Kwara State include farming, fishing, and pottery, weaving and trading (KWADP, 2014). The state also has government institutions that cuts across different sectors of the economy both federal and state owned as well as private organizations where people are employed.

Sampling Procedure

The populations for this study were professionals from Agricultural and Rural Management Training Institute (ARMTI), National Centre for Agricultural Mechanization (NCAM) and Nigerian Stored Products Research Institute (NSPRI) in Ilorin, Kwara State. These professionals are the faculty / technical staff who are involved in training, research and consultancy services which are the core mandates of these organizations. Taro Yamane's formular was used to determine the sample size from a total population of 183 faculty staff members across ARMTI, NCAM and NSPRI in Kwara State resulting in 125 professionals who were randomly selected across the chosen organizations based on probability proportion to their staff strength. The formular is stated below following Taro Yamane (1967) formula:

$$n_0 = \frac{N}{1 + N(e^2)}$$

Where n_0 = required sample size

N = total population size

e = error term or margin error depending on your % error

N=183, e=0.05

$$n_0 = \frac{183}{1 + 183(0.05^2)}$$

$$= 125.55$$

Where proportionate selection was done using the formula below

$$n_j = \frac{K \times n}{N}$$

n_j = size of the jth stratum

K= population size in the stratum

N= entire population

n_0 = sample size

Data Collection

Primary data were collected using structured questionnaires while secondary data were obtained from journal publications and books.

Analytical Techniques

The analytical techniques used for the study are descriptive statistics such as mean, frequency, likert-type scale and inferential statistics such as binomial logistic regression. According to Vagias (2006), the likert–type scale response anchor appropriate for this analysis are as follows: A 5-point likert-type scale was used to describe the level of awareness of digital tools, a 7-point likert-type scale was also used to describe the importance of digital tools to their jobs, and a 4- point likert type scale was used to describe the constraints to the use of digital tools. The ratings were in the following order respectively: Extremely aware = 5, Moderately aware = 4, Somewhat aware = 3, Slightly aware = 2, and Not aware = 1 Extremely important = 7, Very important = 6, Moderately important = 5, Neutral = 4, Slightly important = 3, Low importance = 2, and Not at all important = 1. Also, Serious problem = 4, moderate problem = 3, minor problem = 2, and not a problem at all = 1.

Any digital tool with less than 2.43 which is the average value implies unawareness of the digital tool while above 2.43 implies the awareness of the digital tool. Any digital tool with less than 4.72 which is the average value implies unimportance of the digital tool while above 4.72 indicates the importance of the digital tool. As well, Serious problem = 4, Moderate problem = 3, Minor problem = 2, Not at all a problem = 1.

Any digital tool with above 2.87 which is the average value implies major constraints to the use of the digital tool while less than 2.87 indicates that it is not a major constraint to the use of the digital tool.

Binomial Logistic Regression Model

The Binomial logistic regression model was applied to determine the factors influencing the willingness to pay for training on digital tools among professionals. Binomial logistic regression is most appropriate when the outcome variable has two categories (Borooah, 2002). As used by Norusis (1993), this model establishes the relationship between a binary outcome variable (S_i) and the determinants X_i is specified as: $S_i = ßX_i + u_i$

Where S_i = Binary willingness to pay for training status, assigned a value of 1 for professionals that are willing to pay for training on digital tools and zero for those that are not willing to pay.

ß = Vector of the respective parameter, estimated through the method of maximum likelihood.

X_i = Independent variables, ui = error term.

According to Norusis (1993), the probability of an event occurring is estimated as:

$$\text{prob (event)} = \frac{1}{1+e^{-z}}$$

Y is expressed as:

$$Y = ß_0 + ß_1X_1 + ß_2X_2 + ß_3X_3 + ß_4X_4 + \cdots ß_nX_n$$

For this study, the event is the willingness to pay for training on digital tools among professionals.

= $ß_0$ and $ß_1$ denote the coefficients associated with the respective parameters.

i = 1, 2, 3, 4, 5……n

The independent variables are:

X_1 = Age of the professionals (years)

X_2 = Gender (Male =1, otherwise = 0)

X_3 = Educational level (Years of schooling)

X_4 = Household size (Adult equivalent)

X_5 = Membership of professional association (Yes = 1, otherwise = 0)

X_6 = Monthly income (Naira)

X_7 = Working experience (Years)

X_8 = Attendance of digital trainings (Number)

Results and Discussion

Table 1 presents the socioeconomic characteristics of professionals in the agricultural institutes in Kwara State. The characteristics discussed are gender, age, marital status, educational qualification, household size, monthly income, working experience and membership of professional association.

Table 1: Socioeconomic Characteristics of Professionals in the Agricultural Institutes in Kwara State

Characteristics	Category	Frequency (n=125)	Percentage	Mean
Sex	Male	78	62.4	
	Female	47	37.6	
Age	25-30	9	7.2	40.4
	31 – 40	59	47.2	
	41- 50	45	36.0	
	51-60	12	9.6	
Marital status	Single	15	12.0	
	Married	109	87.2	
	Widowed	1	0.8	
Educational qualification	Bachelor's degree	31	24.8	
	Masters' degree	62	49.6	
	Ph.D. holder	32	25.6	
Household size	1-5	94	75.2	4.5
	6-10	31	24.8	
Monthly income	<150,000	20	16.0	₦197,727.41
	150,000-200,000	62	49.6	
	>200,000	43	34.4	
Working experience	≤10	68	54.4	11.18
	11-20	48	19.2	
	≥21	9	3.6	
Membership of professional association	Yes	115	92.0	
	No	10	8.0	

Source: Field survey, 2025.

Majority (62.4%) of the professionals were male with an average age of 40 years. This shows there were more male faculty staff in the agricultural institutes. The average age means that these professionals are still in their active stage of life. This is similar to the findings of Abioye *et al.,* 2024 which recorded an average of 45 years. Majority (87%) of them were married with about 50% of them having a Masters' degree qualification**.** The implication is that the professionals have higher qualifications required for their jobs. The respondents have average household size of 4 with an average income of ₦197,727.41. The average years of working experience is 11 years with 92% of the professionals belonging to various professional associations. This shows that the professionals are quite experienced and exposed to other professionals through their networks.

Table 2 presents digital characteristics of professionals in agricultural institutes. The characteristics discussed are types of sponsorship on digital training, number of digital training attended, and willingness to pay for training on digital tools.

Table 2 shows that 59 % of the professionals had digital training that was sponsored by their organizations with about 98% of them attending between 1 and 5 digital training sessions. Forty-eight percent (48.8%) of the professionals were willing to pay for training on digital tools. This shows that the agricultural institutes need to invest more on digital training for their faculty staff.

Level of Awareness of Digital Tools among Professionals in Agricultural Institutes

Table 3 presents the level of awareness of digital tools among professionals in agricultural institutes. The digital tools discussed are Google meet, Microsoft teams, Google classroom, Microsoft sharepoint, Google slides, STATA, R, BI, Canva, Google form, Kobo tool box, Slido, Kahoot, Mural, and Asana.

Table 2: Digital Characteristics of Professionals in Agricultural Institutes (n = 125)

Characteristics	Category	Freq	Percent
Types of sponsorship on digital training*	Organisation	74	59.2
	Self- sponsored	40	32.0
	Free	83	66.4
	No	20	16.0
Number of digital training attended	1-5	115	92.0
	6-10	5	4.0
	>10	5	4.0
Willingness to pay for training on digital tools	Yes	61	48.8
	No	61	48.8

Source: Field survey, 2025. *multiple responses, Freq = Frequency, Percent = percentage

Table 3: Level of Awareness of Digital Tools

Variables	Mean	Decision	Rank
Google meet	3.61	A	1st
Google form	3.49	A	2nd
Microsoft teams	3.14	A	3rd
Google classroom	3.00	A	4th
Kobo tool box	2.98	A	5th
Google slides	2.88	A	6th
Canva	2.71	A	7th
STATA	2.67	A	8th
Microsoft sharepoint	2.34	R	9th
R	1.98	R	10th
Slido	1.75	R	11th
Mural	1.71	R	12th
Asana	1.62	R	13th
Kahoot	1.58	R	14th
BI	1.08	R	15th

Field survey, 2025.

The result in Table 3 reveals that the digital tools that had values above the mean value of 2.43 calculated from 5-point rating scale were accepted. These are Google meet, Microsoft teams, Google classroom for communication, Google form, Kobo tool box for data collection, Google slides for presentation, Canva for graphic and design and STATA for Data analysis. They were ranked 1st- 8th respectively. This corroborates the findings of Ifeanyi - Obi and Corbon (2023) which reported that professionals in agricultural sectors were aware of digital tools. The digital tools that had mean values below 2.43 were rejected because these showed that the professionals were not aware of these digital tools.

Relevance of Digital Tools to Professionals in Agricultural institutes

Table 4 presents the digital tools that the professionals in agricultural institutes in Kwara State considered as important. The digital tools discussed are google meet, micrososoft teams, Microsoft sharepoint, google slides, STATA, R, Canva, Mural, Google form, BI, Slido, Kahoot, Asana and Google classroom.

The result in Table 4 reveals that the digital tools that had values above the average value of 4.72 calculated from 5 - point rating scale were accepted. They are google form, goggle meet, google classroom, kobo tool box, microsoft teams, Canva, google slides, and STATA which were ranked 1st- 8th respectively. This corroborates the findings of Ifeanyi - Obi and Corbon (2023) which indicate high level of utilization of digital tools showing the importance of the digital tools. The digital tools that had mean values below 4.72 were rejected because these showed that these digital tools were considered as not important to their jobs.

Constraints to Digital Tools Usage by Professionals in Agricultural Institutes

Table 5 presents the result of constraints to digital tools usage by professionals in agricultural institutes in Kwara State. The factors discussed are inadequate funds, high cost of technology, inadequate training opportunities, poor network connectivity, poor technical know-how, inadequate time for learning, and poor political will.

Table 4: Importance of Digital Tools

Variables	Mean	Decision	Rank
Google form	5.35	A	1st
Google meet	5.34	A	2nd
Google classroom	5.30	A	3rd
Kobo tool box	5.28	A	4th
Microsoft teams	5.00	A	5th
Canva	4.97	A	6th
Google slides	4.95	A	7th
STATA	4.86	A	8th
R	4.55	R	9th
Microsoft sharepoint	4.48	R	10th
BI	4.21	R	11th
Slido	4.19	R	12th
Mural	4.18	R	13th
Kahoot	4.08	R	14th
Asana	4.02	R	15th

Source: Field survey, 2025

The result in Table 5 shows that inadequate training opportunities, high cost of tools, poor network connectivity, inadequate funds, poor technical know-how were the major constraints faced by the professionals as they ranked 1st to 5th respectively and also had mean score values above the grand mean of 2.87. This is similar to the findings of Godson-Ibeji *et al,* (2018) who reported poor network coverage and high cost of electrical gadgets as some of the key challenges faced by agricultural extension in the use of e-extension tools in Imo State. Majority (76.0%) of them perceived inadequate training opportunities as a moderate to serious barrier, and 42% of the professionals considered high cost of tools as moderate barrier while 42% of them considered poor network connectivity as a moderate barrier.

Factors influencing the Willingness to Pay for Training on Digital Tools among Professionals in Agricultural Institutes in Kwara State

Table 6 presents the result of the factors influencing the willingness to pay for training on digital tools among professionals. The factors discussed are age, gender, educational level, household size, membership of professional association, monthly income, working experience and attendance of digital training.

Table 5: Constraints to Digital Tools Usage by Professionals in Agricultural Institutes

Variables	Serious problem	Moderate problem	Minor problem	Not at all a problem	Mean	Rank
Inadequate digital training opportunities	55 (44.0)	40(32.0)	17 (13.6)	13(10.4)	3.09	1st
High cost of tools	44 (35.2)	53 (42.4)	17 (13.6)	11(8.8)	3.04	2nd
Poor network connectivity	43(34.4)	53 (42.4)	17 (13.6)	12(9.6)	3.01	3rd
Inadequate funds	46 (36.8)	42(33.6)	22(17.6)	15(12)	2.95	4th
Poor technical know how	42 (33.6)	47(37.6)	20 (16.0)	16 (12.8)	2.92	5th
Poor political will	28(22.4)	45(36.6)	27(21.6)	25(20.0)	2.60	6th
Inadequate time for learning	24(19.2)	39(31.2)	40 (32.0)	22(17.6)	2.52	7th

Source: Field survey, 2025, *Percentages are values in parenthesis.

Table 6: Factors influencing the Willingness to Pay for Training on Digital Tools among Professionals in Agricultural Institutes in Kwara State

Variables	Coefficient	Standard error	P>|t|
Age (Years)	-0.1212**	0.0539	0.024
Gender (Male=1, otherwise =0)	0.8293*	0.4972	0.095
Educational level (Years of schooling)	0.2072**	0.0810	0.010
Household size (Adult equivalent)	-0.2391	0. 1756	0.173
Membership in professional associations (Yes=1, otherwise =0)	1.4171*	0. 8543	0.097
Monthly income (Naira)	-6.14e-06	5.34e-06	0.250
Working experience (Years)	-0.0366	0.04214	0.385
Attendance of digital training (Number)	0. 1639	0. 5564	0.768
Constant	2.6672	2.0221	0.187
Number of observations 125			
Log likelihood -58.514342			
LR chi^2 (8) 34.83			
Prob > chi^2 0.0000			

Source: Data Analysis, 2025; **P<0.05 and * P<0.10

The Binomial logistic regression result reported a log likelihood of -58.514342 and a chi-square value of 34.83 which is significant at 1% level (p = 0.0000). The implication is that the model exhibits a good fit and is capable of explaining the variables. The result in Table 5 shows that age, gender, educational level and membership in professional association were the significant factors that influenced the willingness to pay for training on digital tools among professionals.

Age was negatively significant at 5% level, indicating that as professionals' age increases, the likelihood of their willingness to pay for training on digital tools decreases. In other words, older professionals tend to use fewer digital tools because as they climb their career ladder, their responsibilities are more of administrative duties and they may be less inclined to pay for training on digital tools due to less perceived need for new digital skills.

The analysis showed that sex significantly influenced the willingness to pay for training on digital tools at 10% level positively. This implies that male professionals had a high probability to pay for training on digital tools compared to their female counterparts probably because the technological space is dominated by men. This contradicts the findings of Abioye *et al.,* (2024) who reported that sex negatively influenced willingness to adopt digital application tools.

Educational level demonstrated a positive and statistically significant influence on willingness to pay for training on digital tools, at 5% level of significance indicating that professionals with higher level of education are likely to pay for digital tools training more than those with lower level of education. Probably because those with higher qualifications may be more aware of the benefits of digital tools for research productivity, publication, and collaboration; hence they are more willing to pay. This corroborates the findings of Abioye *et al*., (2024) who reported that level of education positively influenced the willingness to adopt digital application tools.

A positive and significant influence (at the 10% level) was observed between willingness to pay for training on digital tools and membership in professional associations. This suggests that professionals belonging to professional associations are more likely to pay for training on digital tools. This may be linked to the fact that professional associations usually promote capacity building by organizing seminars, workshops, training, and conferences which

increase members' awareness of the importance of digital skills.

Conclusion and Recommendations

The study concludes that professionals in agricultural institutes in Kwara State are aware of, and consider digital tools such as google form, goggle meet, google classroom, kobo tool box, microsoft teams, Canva, google slides, and STATA as important to their jobs. The constraints to the use of digital tools in order of severity are inadequate training opportunities, high cost of tools, poor network connectivity, inadequate funds and poor technical know-how. The factors influencing willingness to pay for training on digital tools are age, sex, educational level, and membership of professional association. The study therefore recommends that professionals should leverage on their professional associations for more training on digital tools. Their organizations should also provide more training on digital tools to their staff especially the female professionals.

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