(RESEARCH ARTICLE)

Predictors of lecturers' attitude and access to use of information and communication technology in teaching agriculture in universities in south-south Nigeria

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Abstract

The purpose of this study was to assess the predictors of Lecturers' attitudes and access to the use of Information and Communication Technology (ICT) in teaching agriculture in Universities in South-South Nigeria. Ex-post facto design was adopted for the study. The study answered two research questions and tested two null hypotheses and was carried out in Universities in South-South Nigeria. The population of the study was 395 lecturers and a multistage sampling technique was used to sample 199 Agriculture lecturers in five states in the South-South zone of Nigeria. Data were collected using a structured questionnaire designed on a 4-point and analyzed using mean and standard deviation for research questions and t-test for the hypotheses. The result revealed among others that, predictors of agriculture lecturers' access to the use of ICT are adequate skill in operating ICT facilities, availability of ICT facilities, and internet connectivity while factors that predict lecturers' attitude towards the use of ICT in teaching agriculture were availability of ICT, having an adequate skill for operating ICT facilities, and having adequate time allocated for the lecture among others. The study recommended among others that there is a need to ensure that ICT facilities available to the agriculture lecturers for teaching should be periodically upgraded to be at par with current digital technologies. To this end, collaboration with institutions of higher learning in technologically advanced countries should be fostered by institutions covered by this study to benefit lecturers, students, and the academic community at large.

Keywords: Attitude; Access; ICT; Lecturers; Predicators; Teaching Agriculture.

1. Introduction

Information and Communication Technology is essential to obtaining high-quality education both in quantitative and qualitative form in academic institutions, especially in developing nations like Nigeria. Information and Communication Technology (ICT) according to [1], is a medium through which learners can observe real-life activities. Through this medium, a variety of technological tools and resources can be used for transmitting, storing, creating, and sharing knowledge in agriculture [2]. These tools and resources useful in teaching Agricultural education with ICT include but are not limited to computers, radio, smart television, smartphones, internet facilities like websites, emails, and blogs among others, and more recently the embedment of Artificial Intelligence and robotics in information sharing.

Generally, the use of ICT is no longer an option but a necessity in higher institutions of learning, especially Universities [3]. [4] affirmed that ICT has greatly revolutionized teaching. To this end, Lecturers in agriculture by necessity are compelled to be engaged and supported fully in ICT integration to meet the 21st century skills in teaching. Thus, access, administrative support, and technical expertise to Lecturers in agriculture are key to ICT integration in higher institutions [5].

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More so, [6] observed that ICTs can be in traditional forms like radio and television as well as in contemporary like the internet and telecommunication technologies. This traditional to contemporary range of ICT offers teaching options spanning from video conferencing through multimedia delivery to websites useful in meeting the present-day challenges of teaching Agricultural education. However, this is dependent on the efficient exchange of human knowledge, which can happen in synchronous or asynchronous blended learning environments, depending on the attitudinal circumstances. This means that the attitude of the personnel involved in the use of ICT can therefore predict the deployment of ICT in the teaching process.

Attitude drives an individual to be positive or negative towards an action [7]. This demonstrates that an attitude can range from being exceedingly negative to being excessively positive, reflecting a person's assessment of their positive and negative support for an action such as the use of ICT for teaching Agricultural education [7, 8]. This invariably could lead to acceptance or rejection of ICT in teaching agriculture. Thus, Lecturers' professional development is an important factor in the successful integration of ICT facilities into classroom teaching. This integration could be further enhanced with better access to ICT tools and resources for teaching agriculture.

Access to the use of available ICT is critical to integration because accessibility is the capacity to utilize an ICT system and its entity's features alongside the potential advantages [8]. Thus, access to university-based ICT infrastructure and resources is necessary for the integration of ICT in education as it demonstrates the rudiment to effective utilization of ICT in universities.

Some studies in most developing countries like Nigeria have shown that Lecturers adoption of ICT for teaching is discouraging [9]. This discouragement could be traced to access to ICT utilization in universities. Several studies affirmed that Lecturers' attitude toward e-learning was influenced by their access to ICT facilities and training and this access was a significant predictor of their attitude toward using technology and other digital media in teaching [10, 11, l2]. A crucial element in the effective integration of ICT resources into classroom instruction is the training of Lecturers. Some research has shown that ICT-related training programs improve lecturers' competencies in ICT use and affect their attitude toward ICT use, regardless of experience level [13, 14]. This suggests that Lecturers who believed that ICT could immensely improve teaching could technologically have positive attitudes towards ICT usage in teaching agriculture.

The use of ICTs in university settings has improved teaching and learning, which has had a significant impact on students' achievement of educational goals [15, 16]. For this reason, gaining access to ICT resources is essential to the effective adoption and integration of technology. However, several reasons may be adduced why ICT resources may not be easily accessible, including inadequate resource organization, subpar hardware, inappropriate software, or Lecturers' lack of personal access. This is in addition to the simple lack of hardware, software, or other ICT materials within the university. Therefore, this study seeks to investigate the predictors of Agriculture lecturers' attitudes and access to the use of ICT for teaching Agriculture in universities in South-South Nigeria.

1.1. Purpose of the Study

Specifically, this study sought to:

- assess the factors that predict the attitude of Agriculture lecturers towards the use of ICT for teaching agriculture in universities in South-South Nigeria; and
- identify the factors that predict Agriculture lecturers' access to the use of ICT for teaching agriculture in universities in South-South Nigeria.

1.2. Research Questions

The following research questions guided the study:

- What are the factors that predict Agriculture lecturers' attitudes towards the use of ICT for teaching agriculture in universities?
- What are the factors that predict Agriculture lecturers' access to the use of ICT for teaching agriculture in universities?

1.3. Hypotheses

The following hypotheses were generated to direct the study:

- There is no significant difference between the mean responses of male and female Agriculture lecturers on factors that predict their attitude towards the use of ICT for teaching agriculture in universities.
- There is no significant difference between the mean responses of male and female Agriculture lecturers on factors that predict their access to the use of ICT for teaching Agriculture in universities.

2. Methodology

The study adopted ex-post facto design. This study was delimited to universities in South-South Nigeria which comprises five states namely; Rivers, Delta, Edo, Cross River, and Bayelsa State. The population of the study was 395 Lecturers in five States in South-South geopolitical zones. This includes Lecturers from the faculty of Agriculture and the Department of Agriculture Education from different universities in the study area. A multistage sampling techniques were used to sample 199 Lectures from various universities under study. A structured questionnaire was used to collect data from the respondents. The questionnaire was constructed using the 4-point rating scale of strongly Agree=4, Agree=3, Disagree=2 and Strongly Disagree=1. The questionnaire was subjected to face validation by three experts, one from the Department of Agricultural Education, one from the Faculty of Agriculture, and one from Measurement and Evaluation all from Delta State University, Abraka. The validated instrument was administered to Agriculture lecturers. The result of the reliability instrument was analyzed using Cronbach Alpha Method. A mean reliability coefficient above 0.70 was obtained which signifies that the instrument was reliable and adequate for the study. The data collected were analyzed using means and standard deviation to answer research questions while the t-test was used to test the hypotheses. Any item with a mean rating of 2.50 and above was regarded as agreed, while any item with a mean rating of less than 2.50 was regarded as disagreed. Any hypothesis whose significance level was less than or equal to 0.05 level of significance, was rejected while a hypothesis with a significance level greater than 0.05 level was accepted.

3. Results

3.1. Research Question 1

What are the factors that predict lecturers' attitudes towards the use of ICT for teaching agriculture in universities?

Hypothesis 1

There is no significant difference between the mean responses of male and female Agriculture lecturers on factors that predict their attitudes towards the use of ICT for teaching agriculture in universities.

Table 1 Mean and Standard Deviation of the Responses of Agriculture Lecturers on Factors that Predict the Attitude of Lecturers Towards the use of ICT for Teaching Agriculture in Universities (n=185).

S/N	Items	$\bar{x}_1$	SD1	$\bar{x}_2$	SD2	Df	t	P	Decision
1.	The availability of ICT determines its use in lecture delivery	3.76	0.43	3.78	0.42	183	-0.15	0.88	NS
2.	Having adequate skills for operating ICT facilities	3.50	0.50	3.63	0.49	183	-1.60	0.11	NS
3.	If there is adequate time allocated for the lesson, I will use ICT	3.40	0.49	3.24	0.52	183	1.83	0.07	NS
4.	I feel that ICT will enhance my job performance	3.48	0.50	3.51	0.51	183	-0.39	0.70	NS
5.	The use of ICT will not trigger any conflict in my lesson delivery	3.46	0.51	3.37	0.57	183	1.01	0.32	NS
6.	I believe that ICT will make learning more student-centred	3.60	0.49	3.43	0.61	183	1.90	0.06	NS
7.	I believe that ICT will help me gather materials for my lesson delivery	3.61	0.50	3.51	0.51	183	1.19	0.24	NS
8.	ICT will help me to access information fast	3.51	0.50	3.49	0.51	183	0.30	0.77	NS
9.	ICT would save me time-effort in teaching	3.40	0.49	3.55	0.50	183	-1.78	0.08	NS

10.	Using ICT in teaching will make my lessons more interesting and enjoyable	3.46	0.51	3.45	0.54	183	0.08	0.94	NS
11.	Using ICT to teach frightens me	1.40	0.49	1.33	0.47	183	0.87	0.39	NS
12.	It would be hard for me to learn to use ICT in teaching	1.40	0.49	1.49	0.51	183	-1.03	0.30	NS

Significant Level = (p > 0.05) Key: $\bar{x}_1$ = Mean of male; SD1 = Standard deviation of male; $\bar{x}_2$ = Mean of female; SD2 = Standard deviation of female; df = degree of freedom; t = calculated value of t; p = table value; S = Significant; NS = Not Significant; Source: Field Survey (2023)

The result in Table 1 revealed that items 1 to 12 had mean values ranging from 3.40 to 3.76 for males while that of females ranged from 3.24 to 3.78 and this is above the cut-off point of 2.50. This indicates that the 10 identified items in the table are factors that predict Lecturers' attitudes toward the using of ICT in teaching. The standard deviation value of items 1-12 ranged from 0.43 to 0.51 for males while the female ranged from 0.42 to 0.61. Also, items 11 and 12 had their mean value of 1.40 and 1.49 for both males and females respectively, which is below the cut-off point and standard deviation of 0.49 and 0.51, this shows that those factors do not predict lecturers' attitudes in the use of ICT in teaching. The result in Table 1 further indicated that the p-value is greater than the alpha value of 0.05; the null hypothesis was therefore accepted. Therefore, there is no significant difference between the mean responses of male and female Agriculture lecturers on factors that predict their attitudes toward the use of ICT for teaching Agriculture in universities.

3.2. Research Question 2

What are the factors that predict Agriculture lecturers' access to the use of ICT for teaching agriculture in universities?

Hypothesis 2

There is no significant difference between the mean response of male and female Agriculture lecturers on factors that predict their access to the use of ICT for teaching agriculture in universities.

Table 2 Mean and Standard Deviation of the Responses of Male and Female Agriculture Lecturers on Factors that Predict Access to the Use of ICT for Teaching Agriculture in Universities (n=185).

S/N	Items	$\bar{x}_1$	SD1	$\bar{x}_2$	SD2	df	t	P	Decision
13.	Adequate skill in operating ICT facilities	3.51	0.56	3.57	0.50	183	-0.63	0.53	NS
14.	Availability of ICT facilities	3.84	0.37	3.88	0.33	183	-0.66	0.51	NS
15.	Availability of data	3.64	0.48	3.59	0.50	183	0.59	0.56	NS
16.	Good internet connectivity	3.63	0.53	3.57	0.50	183	0.62	0.54	NS
17.	Good resource organization	3.48	0.54	3.47	0.50	183	0.10	0.92	NS
18.	Good quality hardware	3.46	0.50	3.57	0.50	183	-1.39	0.17	NS
19.	Availability of educational software	3.40	0.51	3.41	0.50	183	-0.05	0.96	NS
20.	Model of ICT system	1.61	0.53	1.67	0.52	183	-0.72	0.47	NS
21.	Availability of electricity	3.65	0.48	3.80	0.41	183	-1.94	0.06	NS

Significant Level = (p > 0.05); Key: $\bar{x}_1$ = Mean of male; SD1 = Standard deviation of male; $\bar{x}_2$ = Mean of female; SD2 = Standard deviation of female; df = degree of freedom; t = calculated value of t; p = table value; S = Significant; NS = Not Significant; Source: Field Survey (2023)

The findings in Table 2 revealed that all nine items except item 20 had mean scores for males and females between 3.40 to 3.84 and 3.41 to 3.88 respectively which are greater than the cut-off point value of 2.50. This signifies that the eight identified items in Table 2 are factors that predict Agriculture lecturer's access to the use of ICT. The mean value of item 20 in the table for both males and females was 1.61 and 1.67 which is less than the cut-off point value of 2.50 indicating that item 20 is not part of factors that predict Agriculture lecturers' access to the use of ICT. The standard deviation for males is between 0.37 to 0.56 while that of females is between 0.33 to 0.50 indicating that the respondents were not far from the opinions of one another in their responses. The data on the hypothesis revealed that the p-value is greater than

the alpha value of 0.05 level of significance. Thus, the null hypothesis was therefore accepted implying that there is no significant difference between the mean value of the responses of male and female Agriculture lecturers on factors that predict access to ICT by agriculture lecturers for teaching agriculture in universities.

4. Discussion of Findings

 Table 1 revealed that 10 identified items are factors that predict Lecturers' attitudes towards the use of ICT in teaching. The findings are in agreement with that of [3] who found that a majority of Lecturers show discontentment in receiving ICT complaint support in teaching. Also, in line with the finding, [5] reported that teachers' attitude is not influenced by their socio-economic profiles. This suggests that the predictive factors identified in this study are external to the Lecturers' socio-economic status. Furthermore, the finding of the study revealed also that using ICT to teach doesn't frighten the lecturers as they can to learn to use ICT in teaching. This finding is supported by [4] who found that College of Education lecturers had a favorable attitude toward ICT and are more moderately competent in the use of ICT. This implies be frighten is not a factor that predicts Lecturers' attitudes in the use of ICT for teaching. Given these findings, it is firmly believed that the future of teaching, instructing, and learning in the field of Agriculture will be technology-driven and student-centered. The finding further showed that there was no significant difference between the mean responses of male and female Agriculture lecturers on factors that predict their attitudes toward the usage of ICT for teaching agriculture. This finding is supported by [4] that ICT is now widely deployed in most higher institutions. This suggests that male and female Lecturers face same obstacles in the use of ICT.

Based on the findings in Table 2, it was discovered that eight items were identified as factors that predict agriculture lecturers' access to the use of ICT. The findings are in line with [17], who showed that the availability of ICT facilities predicts its use in teaching. In support of the study, [10] found that lecturers' attitude towards e-learning was influenced by their access to ICT facilities and training. The findings are also aligned with [11] that Lecturers' access to ICT was a significant predictor of their attitude towards using technology in teaching. This suggests that Lecturers' exhibit a positive attitude in the use of ICT for teaching whenever the facilities are available. The study further revealed that there is no significant difference between the mean response of male and female Agriculture lecturers on factors that predict their access to the use of ICT for teaching agriculture in universities. This implies that access to ICT facilities is not gender biased.

5. Conclusion

Ten items were identified as factors that predict Lecturers' attitudes toward the use of ICT in teaching in the selected areas among which are the availability of ICT, having adequate skills for operating ICT facilities, and having adequate time allocated for the lesson. However, two items were identified as factors that do not predict the attitude of Lecturers towards the use of ICT such as using ICT to teach frightens me and it would be hard for me to learn to use ICT in teaching. Also, eight items were identified as factors that predict Lecturers' access to the use of ICT among which are the availability of ICT facilities, availability of data, adequate skills in operating ICT facilities, and good internet connectivity. Therefore, the apparent inadequacies of ICT tools availability and other predictors pose a serious challenge to the effective teaching and learning in Nigeria universities.

5.1. Recommendations

Based on the findings, the following recommendations were proffered:

There is a need to ensure that ICT facilities available to the Agriculture lecturers for teaching should be periodically upgraded to meet up with the latest models in the technological markets. To this end, collaboration with institutions of higher learning in technologically advanced countries must be fostered by institutions covered by this project to benefit lecturers, students, and the academic community at large.

ICT facilities such as personal computers, and laptops with the latest version of teaching software packages developed from the advanced countries, modified to suit the specific needs of the local environment must be available to the Lecturers as a matter of priority by the relevant authorities. This should also include a pool of support staff such as secretaries, computer operators, analysts, and programmers to run the facilities so that the lecturers would not be distracted from their primary assignment of teaching.

Collaboration and sponsorship by ICT facility manufacturing entities with the local institutions of higher learning so that the necessary support manpower to train the Lecturers is made readily available.

Regular training for the Lecturers particularly to catch up with the needed skills to operate the equipment is also recommended. Joint venture efforts with universities facilities of engineering to fabricate some of the hardware should be encouraged based on research efforts and results.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest exists in this study.

Statement of informed consent

Consent to collate the opinion of Agriculture lecturers from South-South universities was given by each respondent before the instrument was administered.

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