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Influence of ICT Availability, Accessibility, and Utilization on Agriculture Students' Academic Performance in Universities

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ABSTRACT

This study investigated the influence of ICT availability, accessibility, and utilization on agriculture students' academic performance at universities. The study adopted a descriptive research design of survey type because data can be collected from a large population for generalization. A simple random sampling technique was adopted in selecting 200 students from the 2 best universities among 4 universities in Nigeria. We used the instrument for data collection and validated it through experts' judgment and a reliability coefficient of 0.82. Descriptive statistics of mean and standard deviation were used to answer research questions. The findings revealed that; universities in Kwara State have ICT but are not adequately available, the accessibility is not adequate, and the usage is not mainly for academic activities among agriculture students. It was recommended that lecturers and students be encouraged towards a good attitude and readiness to change towards the use of ICT on campuses for better performance.

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1. INTRODUCTION

Agriculture is the process of producing food, fiber, feed, and many more by the cultivation of certain plants and raising of valuable domesticated animals (livestock) for consumption or a sustainable economy. For effective production of agricultural output, there must be a measurable input. Hence, agricultural education is very essential in this respect because it teaches students and aspiring farmers about farming, food production, plant science, biology, animal care, sustainable use of natural resources, and many more. It also includes leadership training, agricultural business leadership, and farm safety. For effective and proper knowledge of agriculture and practice, information and communication technology (ICT) has a vital role to play.

Effective and quality education can only be achieved through adequate teaching and learning. Using innovative technology (IT) in imparting and acquiring knowledge in an educational environment helps teachers to give the expected outcome (Makinde, 2020a). Nigeria, as a developing nation, aims to achieve quality education. The Nigerian National Policy on Education stated that education should sustain its citizens and society. One crucial means deployed for this purpose is Information Communication Technology (ICT).

ICT is any communication devices or facilities like cell phones, television, radio, computer, printer, photocopiers, social networking websites, and satellite systems, among others that are developed as tools and capable of supporting effective educational delivery. Yuliani and Mercuriani (2021) observed that ICT implementation in teaching and learning is still relatively low because it can be influenced by several hindrances which include the poor state of ICT facilities among others in schools (Bolaji & Adeoye 2022; Bolaji & Jimoh, 2023).

Akinsola (2010) reported the need for the Federal Government of Nigeria to make the use of Information communication technology (ICT) facilities compulsory in teaching and learning. It was noted that despite its potential in the development of education, not many schools in Nigeria had extensively adopted ICT facilities for teaching and learning. It was added that education has been greatly influenced by ICT, which has undoubtedly affected teaching, learning, and research.

Akinsola (2010) opined that if ICT is in full adoption in Nigerian schools, it will have a positive impact on teaching, learning, and research. Recently, research had proven that ICT had great benefits and a high potential to improve the quality of education at all levels. To students, ICT has the potential to accelerate, enrich and deepen skills to motivate, engage and help to relate school experience to work practices because the improved quality of education was essential to the creation of effective human capital in any country (Olatunde, 2010).

The need for ICT in the Nigerian educational system especially in the area of agricultural production and extension cannot be overemphasized because, in this technology-driven age, everyone requires ICT competence to survive. The recent efforts made by the government toward the integration of ICT into the educational system have not had much impact. Problems such as poor policy and project implementation strategies and limited or poor information infrastructure militate against these efforts. However, the ministries of education at both federal and state levels were urged to post ICT-skilled teachers to teach in primary and secondary schools for the implementation of the integration of ICT in schools.

Hence, university dons should not be left out. However, according to Mbah (2010), data reveals that University students' daily use of ICT to support their studies with regards to the use of computers to support studies, 83% say they use the computer daily to support their studies. According to Islam and Fouji (2010), ICT was described as technologies such as

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desktop and laptop computers, software, peripherals, and connections to the Internet that are intended to fulfill information processing and communication functions. There is no standard definition for student performance. The standard approach focuses on achievement and curricula, how students understand the courses and obtain their degrees or their marks.

Recommendations from the National Research Council opined that there is a need for instructional changes in undergraduate coursework in colleges of Agriculture to improve 21st-century skills, which included critical thinking, problem-solving, and communication. The coursework could include what will make students venture into the fabrication, installation, and maintenance of indigenous mechanized agricultural technologies as an enterprise to promote farming activities, thus becoming self-reliant in society.

Correspondingly, Azogu (2009) asserts that many functional agricultural centers have developed technologies that encouraged the use of mechanized technology through the fabrication of several indigenous machines like manual seed planters, manual seed and fertilizer broadcasters, and groundnut digger among others with the training of youths on how to locally fabricate these machines for employment generation. Students could also develop skills for the fabrication of indigenous technologies like cassava lifters, peelers, graters, and hand mills through participatory activities in the workshop for self-empowerment.

Olugbemi and Ajileye (2021) revealed that secondary schools have ICT facilities but not available in required quantities and hence hindered their usage for effective teaching and learning in many schools due to a lot of constraints that are bedeviling in secondary schools such as time, inadequate training of teachers, access to ICT facilities, resistance to change and attitude of teachers to new technology among others. Furthermore, Makinde and Abdulsalam (2022) and Nnorom, (2010) opined that student's performance in any subject in school adjudged to be greatly affected by available learning resources.

These resources like libraries, ICT gadgets, relevant textbooks, laboratories, etc. are not available and where available were not effectively utilized. It was then affirmed that for the effective performance of students in science and biology, the government should provide the necessary machinery for the actualization of educational goals. To implement the use of ICT infrastructure in secondary school teaching and learning, different countries attempted to craft national policies to guide and direct ICT integration into education and social programs.

Many researchers have made contributions to ways to develop agriculture in Nigeria, ranging from funding to infrastructural availability. Characteristically, Nigeria has been heavily dependent on foreign technologies as a means to develop agricultural production forgetting the immense contribution of indigenous mechanized fabricated farm equipment.

These, however, have not made any relevant improvements in food production. This could be due to inadequate ICT, access to ICT, or improper usage of technology in agriculture. Or the constraints associated with the availability, accessibility, and usability of ICT in teaching and learning of agriculture in Nigeria.

The use of Information and Communication Technology (ICT) in teaching and learning agriculture has both negative and positive effects on students' academic performance. For instance, exposure of students to a wide pool of information via the internet may make students focus or get distracted by content that is not relevant to their academic work, therefore, affecting their academic performance negatively, that is if they have access and availability for them to use. However, ICT can help to enhance students' academic performance if it is readily available, accessible, and properly utilized for the purpose.

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One of the major problem's students face in higher institutions is unavailability and inadequate access to ICT infrastructure. The utilization of Information and Communication Technology (ICT) is becoming an important part of education in many parts of the world. Nigeria is not left behind as ICT has gradually found its way into the educational system despite chronic limitations brought about by economic disadvantages (Arciosa, 2022; Rachmawati, 2019).

Realistically, several researchers and commentators in developing countries including Nigeria have admitted that problems abound in agricultural and educational systems that ICT could help to improve. One of the greatest challenges in ICT access and use in agriculture and agricultural education is balancing education goals with economic realities.

ICT in agriculture and agricultural educational programmes require large capital ventures and developing countries including Nigeria need to be cautious in making decisions about what models ICT use will be introduced and to be conscious of maintaining economic scale. Ultimately, it is an issue of whether the value added by ICT use offsets the cost, relative to effectively tallying their ICT instructional materials such as computers, audio-visual aids, slides, video clips, electronic whiteboards, electronic conferencing materials, and so on, to the goals of their instructional objectives, which instigate information search and attribution formulation.

It is upon this background that the study sought to investigate the influence of ICT availability, accessibility, and utilization on the academic performance of university agriculture students in Kwara State, Nigeria. This study provided answers to the following research questions:

(i) What is the level of availability of ICT in the universities in Kwara State, Nigeria?
(ii) Does the accessibility of ICT by agriculture students in universities in Kwara State, Nigeria influence their academic performance?
(iii) Does the use of ICT by agriculture students enhance their academic performance in universities in Kwara State, Nigeria?
(iv) What are the constraints to the effective utilization of ICT by agriculture students in Universities in Kwara State, Nigeria?

2. METHODS

This study adopted a descriptive survey research design because it involved the collection of data from a large population for generalization. The population consisted of all agriculture students in tertiary institutions in Kwara State, Nigeria. A sample of 200 students of 77 females and 123 males were engaged from two universities (private and public) randomly with faculty of agriculture among the 6 top ranking universities in 2021 in Kwara State Universities ranking.

Out of the 6 universities, only 4 are with faculty of agriculture and offer agriculture as a course. Hence, one private and one public university were purposely selected among the 4. The sampled universities were purposely selected because of proximity and the researchers are academic staff of one of the universities.

We designed a questionnaire used for data collection. The instrument was made up of two sections A and B. Section A elicited demographic information of the respondents while section B was constructed in a four-point modified scale of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) to collect data on the research questions.

The validation of the instrument was done through expert judgment involving two lecturers in the Faculty of Agriculture and two lecturers in computer science, measurement,

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and evaluation. This was done to establish both the face and content validity of the instrument. The questionnaire was further trial tested with a similar sample of 20 agriculture students that were not involved in the study. A correlation coefficient of 0.82 was established for the instrument using the test-retest reliability method within three weeks intervals. Copies of the questionnaire were directly administered to the respondents and collected immediately after their responses. As a result of this, the mortality of the instrument was avoided hence, a 100% return rate was recorded for the instrument. The data collected was analyzed descriptively with mean and standard deviation. A mean of 2.50 and above was considered agreed, while a mean score of 2.49 and below was considered disagreed.

3. RESULTS AND DISCUSSION

From the observation through the questionnaire, it can be seen in the following data for the demographics of the respondents (see **Table 1**). This section presents the results of data collected from the respondents in percentages.

Table 1 shows the distribution of respondents by gender, type of institution, age, and level. It was revealed that 200 respondents including 77 (38.5%) of the respondents were females while 123 (61.5%) were males. 89(44.5%) were from private university while 111(55.5%) were public university respondents. The age of the respondents showed that 15-20 years were 80 (40.0%), 21-25years were 62 (31.0%), 26-30years were 43 (21.5%), and above 30 years were 15 (7.5%). The data also depicted that respondents in the 100 level were 23 (11.5%), 200 level were 67 (33.5%), 300 level were 78 (39.0%), 400 level were 22 (11.0%), and final year (500 level) were 10 (5.0%). It can be deduced that the majority of the respondents are male representing 61.5%. The data revealed that the majority of the respondents are between the age of 15 to 30 years representing 85%. Also, the majority of the students in the faculty of agriculture in both universities under observation were at 200 and 300 levels representing 33.5% and 39.9% respectively.

Table 2 shows the mean score of respondents on the level of availability of ICT in the universities with an average mean of 2.41. The majority of the respondents disagreed that there is adequate availability of ICT in the university; that there is no ICT in the university; and that ICT in the university is neither available nor adequate for agriculture students with a mean score of 2.12, 2.25 & 1.98 and SD of 1.03, 1.19, & 1.06 respectively. The finding indicated that university agriculture students in Kwara State confirmed that the universities have ICT but are not adequately available.

While the minority of respondents agreed that there is ICT in the university but not adequate; and finally, that ICT in the university is not functional with mean scores of 2.75, & 2.95, and SD of 0.93, & 1.16 respectively. This finding is in agreement with Olugbemi and Ajileye (2021) who opined that ICT integration in teaching and learning in secondary schools is not sufficiently available and hence cannot be used effectively for teaching and learning in schools. As Makinde *et al.* (2022) claimed that the availability of adequate ICT in schools can motivate students' interest in academic affairs and improve their performance.

From **Table 3**, it was reported that the accessibility of ICT for the academic performance of agriculture students in universities had an average mean score of 2.57. The majority of the respondents agreed that there is access to ICT in the university but not adequate (M=2.75; SD=1.20); access to ICT in the university is limited (M=2.93; SD=0.94); and ICT access allows me to get enough materials for my study (M=2.69; SD=1.19). While the minority of respondents disagreed that students have adequate access to ICT in the university (M=2.32;

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SD=1.16); and finally, that access to ICT in the university distracts attention and let's lose focus (M=2.14; SD=1.08).

Table 1. Demographic distribution of respondents.

Variable	Frequency	Percentage
Gender		
Female	77	38.5
Male	123	61.5
Total	**200**	**100%**
Type of Institution		
Private	89	44.5
Public	111	55.5
Total	**200**	**100%**
Age		
(15-20) years	80	40.0
(21-25) years	62	31.0
(26-30) years	43	21.5
(above 30) years	15	7.5
Total	**200**	**100%**
Level		
100	23	11.5
200	67	33.5
300	78	39.0
400	22	11.0
500	10	5.0
Total	**200**	**100.0%**

Table 2. Availability of ICT in universities for students' academic performance.

Items	N	SA	A	D	SD	Mean	S.D
There is adequate availability of ICT in the university	198	32	22	80	64	2.12	1.03
There is ICT in the university but not adequate	198	52	104	16	26	2.95	0.93
There is no ICT in the university	198	40	56	28	74	2.25	1.19
ICT in my university is neither available nor adequate for agriculture students	198	24	36	54	84	1.98	1.06
The ICT in the university is not functional	198	60	68	24	46	2.75	1.16
Grand Mean						**2.41**	

The finding indicated that university agriculture students ascertained that there is access to ICT on campus but not adequate. This finding is in support of, as cited in Yuliani and Mercuriani (2021) who observed that ICT implementation in teaching and learning is still relatively low because it can be influenced by several hindrances which include the poor state of ICT facilities in schools (Shah, 2022; Akinoso, 2023).

Table 4 shows the usage of ICT by agriculture students in universities with an average mean of 2.44. The majority of the respondents disagreed that ICT is effectively used by agriculture students for academic purposes in the university (M=2.24; SD=1.13); and that ICT is only used for pleasure by agriculture students on campus (M=2.24; SD=1.18).

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Table 3. Accessibility of ICT for the academic performance of agriculture students in universities.

Items	N	SA	A	D	SD	Mean	S.D	Remark
Students have adequate access to ICT at the university	198	48	28	56	66	2.32	1.16	Disagreed
There is access to ICT in the university but no adequate	198	60	68	24	46	2.75	1.20	Agreed
Access to ICT at the university distracts my attention and lets me lose focus	198	31	23	79	65	2.14	1.08	Disagreed
Access to ICT in the university is limited	198	51	105	14	28	2.93	0.94	Agreed
ICT access allows me to get enough materials for my study	198	62	68	24	44	2.69	1.19	Agreed
Grand Mean						**2.57**		

While the minority of respondents agreed that ICT is used but not effectively utilized (M=2.73; SD=1.20); and finally, that ICT is used but not effectively utilized (M=2.65; SD=1.23). The finding indicated that agriculture students in Kwara State universities confirmed that ICT is been used in universities but is not effective for academic performance.

Table 4. Usage of ICT for the academic performance of agriculture students in universities.

Items	N	SA	A	D	SD	Mean	S.D	Remark
ICT is effectively used by agriculture students for academic purposes at my university	198	21	33	69	75	2.24	1.13	Disagreed
ICT is not used at all in my university	198	48	28	56	66	2.32	1.16	Disagreed
ICT is used but not effectively utilized	198	61	69	26	42	2.73	1.20	Agreed
ICT is only used for pleasure by agriculture students on campus	198	31	25	83	59	2.24	1.18	Disagreed
ICT is used but not effectively utilized	198	62	68	24	44	2.65	1.23	Agreed
Grand Mean						**2.44**		

The finding is in agreement with Makinde (2020b) and Akinsola (2010) who noted that ICT facilities have become a daily playing machine for schooling children and there would be a tremendous achievement in both the social lives and academic performance of students if social and mass media as part of ICT facilities are monitored properly for children's use.

From **Table 5**, the mean score of respondents on the constraints to the effective usage of ICT on campus by agriculture students in universities reveals an average mean of 2.86. All the respondents agreed that lack of adequate time for ICT on campus(M=2.78; SD=1.07); lack of effective training on soft skills for ICT usage for students on campus(M=2.95; SD=0.94); Lack of students' confidence poses a challenge to effective use of ICT on campus(M=2.92; SD=1.13); Students' resistance to change and negative attitude as a barrier(M=2.78; SD=1.15); and finally that students lack access to ICT on campus (M=2.87; SD=0.97).

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The finding indicated that constraints bedeviling adequate usage of ICT in universities are numerous. The science teachers' resistance to change concerning the use of new strategies is an obstacle to ICT integration in science and technology teaching.

Table 5. The constraints to the effective use of ICT in universities in Kwara State.

S/No	Items	N	SA	A	D	SD	Mean	S.D	Remark
16.	Lack of adequate free time for ICT usage on campus	198	52	88	36	22	2.78	1.07	Agreed
17.	Lack of effective training on soft skills for ICT usage for students on campus	198	60	100	18	20	2.95	0.94	Agreed
18.	Lack of students' confidence poses a challenge to the effective use of ICT on campus	198	84	64	30	20	2.92	1.13	Agreed
19.	Students' resistance to change and negative attitudes as a barrier	198	76	58	30	34	2.78	1.15	Agreed
20.	Students lack access to ICT on campus	198	60	80	38	20	2.87	0.97	Agreed
	Grand Mean						**2.86**		

4. CONCLUSION

The study investigated how the availability, accessibility, and utilization of ICT influence the academic performance of agriculture students in universities in Kwara State. The findings of this study indicated that university agriculture students in Kwara State, Nigeria noted that: (i) ICT is not adequately available; (ii) ICT is accessed but not in required status; (iii) the use of ICT among students is not mainly for academic pursuit; and (iv) the ICT availability, accessibility and usability confronted with a lot of constraints from both the users and the providers.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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