



## **An Assessment of Availability and Benefits of Information and Communication Technologies (ICTS) in Agricultural Development in Enugu State, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Authors OIN and CIN designed the study, performed the statistical analysis, wrote the protocol and first draft of the manuscript. Authors ONI and CIN managed the analyses of the study. Authors IAE and UVN managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The study examined the availability, level of competence and benefits of Information and Communication Technologies (ICTs) in Agricultural development among agricultural lecturers and students in Enugu State, Nigeria. Almost all the respondents (lecturers 96.9%, students 90%) had acquired ICT trainings. All the listed ICT facilities were available to the respondents except facsimile (Lecturers 9.4%, Students 25%) and satellite technology. The respondents were competent in the use of ICTs except in the use of facsimile and satellite technology. The respondent's lack of competence in the use of facsimile and satellite technology could be as a result of its non-availability in the faculty. On the average, students in the selected institutions are more competent in using ICT facilities than their lecturers, this could be as a result of the student's educational demand to meet up with the requirements of the various courses they need to pass before they could become certified graduate, thus, making them to explore the various ICTs more than the lecturers. The

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respondents perceived ICTs to be beneficial in carrying out their work effectively, helping researchers to source more information for their work, improving research and published work, accelerating, enriching, and deepening skills, motivating and engaging students in learning and saving time. The output of this study is important because it will serve as a blueprint for agricultural libraries, information managers/information scientists, researchers, agricultural lecturers, agricultural students, and all agricultural stakeholders to chart the right course of action for the use of information and communication technologies in developing agriculture through policy formulation and implementation.

*Keywords: Agriculture; availability; benefits; communication; information; technologies.*

## 1. INTRODUCTION

ICTs have been a veritable tool for agricultural development in various ways. These include; facilitating decision-making process, empowering rural communities, targeting marginalized groups, enhancing market outlook, creating employment through rural agricultural centres, provision of equitable access to new techniques for improving agricultural production, processing and utilization and reduce the gap that usually occurs in the traditional information exchange system [1]. ICTs also helps in the development of information systems that address food security issues such as agricultural production, government subsidies for food security, monitoring of water and land resources, diseases, production , processing and utilization problems, food transportation and storage. A lot of losses that could have arisen without communication facilities are saved through the help of Information and communication technologies (ICTs). For example, the global service for mobile communication (GSM) has afforded suppliers and consumers ample opportunity to be in touch with each other thereby ensuring prompt supply of goods and services which undoubtedly reduces wastages [1].

Information and communication technologies make the process of teaching and research more efficient and easier. ICTs are necessary for dissemination and storage of information in different ways. While definitions of ICTs are varied, it might be useful to accept the definition provided by United Nations Development Programme (UNDP): 'ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information [2]. Also according to [3] ICT may be regarded to as the combination of 'Informatics technology' with other related technology, specifically communication technology. The various kinds of ICT products available and

having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audio-cassettes and CD ROMs among others have been used in education for different purposes [4,5,6]. ICT can be used to enhance teaching effectiveness, prepare lesson plan, collect and analyze students' achievement. Thus, curriculum contents could be enriched through search in the internet [7]. ICT can improve the quality of researches and publications in our universities through the use of information and quality materials from the internet and can also facilitate record-keeping by teachers [8]. Therefore, the importance of ICT in enhancing university lecturers' job efficacy cannot be over emphasized.

It is evident that despite the usefulness of online resources, some common problems still exist concerning how such resources are used by lecturers, in particular, and others in the academia, in general. University lecturers have various tasks to accomplish and these range from teaching, research and publications, marking of tests and examinations, supervising students' research activities, supporting students through advisory roles, attending conferences, providing community services etc. In other for them to be effective and efficient, they need to acquire an appreciable level of ICT competence. This is necessary in order to meet up with the demands of their job [9]. While a lecture can be extremely informative, a lecture that integrates pictures or video images can help an individual learn and retain information much more effectively [10]. One of the goals for integrating ICTs in education is to enhance teaching and learning practices thereby improving quality of education [11]. Teachers and students are exploring the new possibilities given by these technologies and constructing capabilities concerning learning through ICT. In Nigeria, for example, many lecturers in the higher institutions of learning still depend solely on the use of the

traditional methods to impart knowledge to their students. This lack of use of ICTs to impart knowledge to students by teachers is discovered to be due to the teachers themselves being illiterates, insofar as the use of the ICT is concerned [12]. Therefore this study examined the availability, competence of use and benefits of ICTs in the study area.

### 1.1 Objectives of the Study

1. ascertain the availability of ICT facilities in Agricultural faculties in the study area;
2. determine the level of competence in the use of Information and communication technologies (ICTs) among agricultural lecturers and students in universities in Enugu State, Nigeria;
3. ascertain the benefits of the usage of ICTs resources by agricultural lecturers and students;

## 2. MATERIALS AND METHODS

The study was carried out in Universities in Enugu state. There are various universities in Enugu State of which some are privately owned and some are owned by the government (federal and state government). The two (2) major universities in Enugu State were the ones used for this study, i.e., University of Nigeria, Nsukka (which has both Enugu campus and Nsukka campus) and Enugu State University of science and technology. (Which has both Enugu campus and Agbani campus). The faculty of Agriculture constitute the population of the study. These two Universities were purposively chosen because they are the two major universities that supports Agricultural development in Enugu State. Some Nigerian universities have played great roles in the development of agriculture of which The University of Nigeria Nsukka, Enugu State happens to be in the fore-front.

For example, in the mid-1980s, researchers in the Department of Crop Science of the University of Nigeria developed a premium chili cultivar popularly called "Nsukka Yellow Pepper", which is now grown widely by farmers, especially in south-eastern Nigeria. The crop has contributed immensely to community development and economic empowerment in the southeast and is marketed around the country. The University of Nigeria has been at the fore-front of agricultural extension services to rural people and farmers through the Village Adoption Scheme, pioneered by the Centre for Rural Development and Cooperatives of the University of Nigeria Nsukka.

Staff of the Faculty of Agriculture provide scientific support to the ADP in their extension projects to farmers under the Training and Visit system [13]. The researchers also developed a new tomato cultivar named 'UN- 83' with a uniquely low moisture content and an ability to last 3 weeks at room temperature without spoilage [14]

Enugu State University of science and technology was purposively chosen for this research because it is approved by Agricultural Science and Technology Indicators (ASTI) as one of the places to obtain Open-access data and analysis on agricultural research investment and capacity in low- and middle-income countries [15].

The departments that are under the agricultural faculty in University of Nigeria Nsukka are Agricultural Economics, Agricultural Extension, Animal science, Crop science, Food science and technology, Home science, Nutrition and dietetics, and Soil science while the departments under Agricultural Faculty in ESUT included Agricultural Economics and extension, Animal science and fishery management, Food science and technology, and Agronomy. Thirty lecturers and sixty students were selected for this study giving a total of 90 respondents for the study. Thirty (32) lecturers were used for the study because of the limited number of Agricultural Lecturers in the selected Faculties of Agriculture. A larger number (60) students were used for the study because there were larger number of agricultural students in the selected Faculties. Data were collected through the use of structured questionnaire.

To ascertain the availability of ICT facilities in the Agricultural faculties (objective one), the respondents were provided with a list of ICT facilities to indicate if they were available (1) or not available (2). The ICT facilities which has up to 50% percent availability, were concluded to be readily available in the Faculty.

To determine the level of competence in the use of Information and communication technologies (ICTs) among the respondents (objective two), a four point Likert-type scale of: high competency (3); moderate competency (2); low competency (1) and no competency (0), was used to determine the respondent's competency in the listed ICTs. The value of the Likert-type scale was added to obtain 6, which was further divided to by 4 to get a mean value of 1.5. Any response option value with a mean value of less than 1.5

was regarded as not being competent. Also, a three point Likert-type scale of: very competent (2), competent (1) and not competent (0), was used to determine the respondent's competency in general ICTs activities usage. Any response option value with a mean value of less than 1 was regarded as not being competent.

To ascertain the benefits of the usage of ICTs by the respondents (objective three). That is, the perception of respondents concerning the degree to which they thought ICTs would be helpful to them in their various work. Options from where respondents was expected to select (as many options as will be applicable to them) was provided. A three point Likert-type scale was used in the measurement of this objective. The options provided included those that indicated that ICTs are: very useful (2), useful (1), or least useful (0). The value of the Likert-type scale was then added to obtain 3, which was further divided to obtain a mean value of 1. Any value which the mean value was equal to or greater than 1.0 was regarded as being useful to the respondent, while a response option with a mean value of less than 1.0 was regarded as not being useful to the respondent.

### 3. RESULTS AND DISCUSSION

#### 3.1 Availability of the ICT Facilities in the Institution

Data in table 1 show that each of the ICT facilities were either available or not available as indicated, among the lecturers and students. Specifically, computers (lecturers 100%, Students 100%); printer (Lecturers 100%, Students 98.3%); photocopying machine (Lecturers 96.9%, students 96.7%); internet (Lecturers 93.8%, Student 96.7%); GSM (Lecturers 96.9%, students 95%); projector multimedia (Lecturers 90.6%, Students 96.7%); flash drive (Lecturers 87.5%, Students 96.7%); scanner (Lecturers 90.6%, Students 91.7%); CD-ROM (Lecturers 87.5%, Students 85.0%); E-mail (Lecturers 84.4%, students 83.3%); magazine (Lecturers 78.1%, Students 96.7%); bulletin (Lecturers 78.1%, Students 86.7%); posters (Lecturers 75.0%, students 96.7%), radio (Lecturers 62.5%, Students 93.3%); Leaflets (Lecturers 62.5%, Students 81.7%); digital camera (Lecturers 53.1%, Students 81.7%) were indicated by the respondents as readily available. This findings reveals that computer and printer are the most widely available ICT facilities in the faculty, amongst other ICT facilities.

This result is in synergy with [16,17,18] who reported that ICT use in teaching and research has become the norm across tertiary institutions where students have been identified as stakeholders in its development and implementation.

The ICT facilities that were not readily available included: facsimile (Lecturers 9.4%, Students 25%) and satellite technology (Lecturer 28.1%, Students 51.7%). The facsimile and satellite technology were not available possibly because of non-purchase or non-subscription for these ICT facilities by the institution.

On the average, students in the selected institutions had more ICT facilities available to than to their lecturers, this could be as a result of the student's educational demand to meet up with the requirements of the various courses they need to pass before they could become certified graduate, thus, making them to acquire explore the various ICTs more than the lecturers. The institution should makes the various ICT facility to be available to the Lecturers in other to improve the quality of their work.

#### 3.2 Level of Competence in ICT Facilities

The data presented in table 2a revealed that the respondents were competent in most ICT facilities including: Global System for Mobile Communications (GSM)/Telephone (Lecturers M=2.88, students M=2.75), Flash drive (Lecturers M=2.71, students M= 2.58), Electronic mail (Lecturers M= 2.70, students M= 2.34); Internet (Lecturer M=2.69, Students M= 2.65), Computers (M=2.63, students M=2.50), Printer (lecturers M=2.55, Students M= 2.33), Photocopy machine (M=2.46, students M= 2.47), CD – ROM (M=2.38 , Students M=1.94), Newspaper (M=2.35, Students M= 2.42), Magazine (Lecturers M=2.33, Students M= 2.50), Bulletin ( Lecturers M=2.29, Students M= 2.28), Radio (Lecturers M=2.28, Students M= 2.48), Leaflet (M=2.24, students M= 2.30), Posters (Lecturers M=2.20, Students M= 2.50), Scanner (M=2.13, Students M= 2.07); Projector multimedia (M=2.13, Students M= 1.93), Digital camera (M=1.87, Students M= 2.20). The implication of these findings is that, the respondents are significantly competent in most ICT facilities. This means that they can easily access and utilize ICT facilities that can help them in their teaching and research activities. This result also supports the findings of [19] who reported that teacher's competency as a result of their prior knowledge and skills in ICT, is positively correlated to

teacher's success in the teaching and learning process. Thus, ICT equips teachers with new skills and innovations in education and in teaching and research [20].

ICT facilities in which respondents were not competent enough on include Satellite technology (Lecturers M=1.07, Students M=1.30); and Facsimile (Lecturers M=0.83, Students M=0.54).

As perusal of the data presented in table 2b, it stated that the fundamental computer activities for which respondent's competence were measured. Majority of the respondents were competent in most of the computer skills, including saving files in personal and general directories (lecturers M=1.75, Students M= 1.77), Cutting/copying and pasting between applications (M=1.69, Students M= 1.82), Minimizing, maximizing and resizing windows (Lecturers M=1.63, Students M= 1.83), Saving and arranging files in a folder (M=1.63, Students M=1.70); Creating shortcuts to the desktop (M=1.58); Using windows explorer to manage file (Lecturers M=1.58, Students M=1.57), Recovery OF accidentally deleted files (Lecturers M=1.41, students M=1.51), Converting word document to pdf documents (Lecturers M=1.39, Students M=1.31); Downloading, installing and updating antivirus (Lecturers M=1.38, students M=1.43), Switching between applications (M=1.16, Students M= 1.51) except Defragmentation of drive C (hard disk) ( Lecturers M=0.63, students M= 0.98) in which the respondents has no competency. The standard deviation of all the variables except Defragmentation of drive C (hard disk) is less than 1, which implies that their general competence in computer usage did not vary too much. The implications here is that, since majority of respondents are generally competent in the use of computers, their ability to access and make use of ICT for teaching and research purposes will be enhanced. The respondent's lack of competence in the use of facsimile and satellite technology could be as a result of its non-availability in the faculty.

The data presented in table 2c determined the competence of respondents in internet and online resources, the data revealed that the respondents were all competent in the use of the listed internet and online resources which included: Knowing how to use search engine like Google, Yahoo, Bing etc. (Lecturers M=1.84, Students M=1.88), Knowing how to find required relevant information that may be required (lecturers M=1.75, Students M=1.82),

Connecting to the internet (M=1.58, Students M= 1.92), Using the internet competently (M=1.61, Students M=1.77), Knowing how to download, install and update softwares (M=1.50, Students M= 1.67), Knowing where to put a URL in the browser to find a particular webpage (Lecturers M=1.31, Students M= 1.58), Knowing how to set up default home page (Lecturer M=1.06, Students M= 1.42); Knowing how to set up preferred default home page (Lecturers M= 1.06, Students M=1.40). The result indicated that respondents were competent in most internet and online activities. In [21] majority of respondents expressed high confidence in their search skills and the influence it had on their use of online resources.

Table 2d which shows the competence of the respondents in using other ICT facilities were measured. They include; Sending SMS/MMS with a mobile phone (Lecturers M=1.81, Student M= 1.87), Printing a typed document from a printer (M=1.69, Students M= 1.77), Creating and sending e-mails (Lecturers M=1.66, Students M= 2.07), Adding contacts to contact list(Lecturers M=1.50, Students M= 1.80), Replying and deleting or forwarding e-mails (M=1.59, Students M= 1.68); Backing up work to flash drive and CD ( Lecturers M=1.53, Students M= 1.63), Attaching a word document or picture to an e-mail and sending as attachment (Lecturers M= 1.56, Students M=1.58); Recording a lecture using radio set (Lecturers M=1.22, Students M= 1.62); Burning of typed document/Video on a CD-ROM/DVD (M=1.44, Students M= 1.37); Know how to play a recorded video on a television (Lecturers M=1.53, Students M= 1.55); Operating the projector (Lecturers M= 1.38, Students M= 1.39); Scanning a printed document (M=1.31, Students M= 1.50). The result shows that the respondents are competent in using other ICT facilities. In conformity with the findings of this study, Google was found to be the most widely used search engine for locating information electronically as in [22,23]. E-journal and e-mail were also found to have been extensively used in an earlier study by [24], just as in the present study. The respondents were not competent in Knowing how to operate fax machine and sending facsimile (Lecturers M=0.41, Students M= 0.54). This could be possibly because of the unavailability of fax machines in Agric. faculties. This result is in consonance with [25] who found out that majority of Agricultural science lecturers of tertiary institutions are generally skilful in computer, internet and online activities.

**Table 1. Availability of the ICT facilities in the institution**

<b>ICTs facilities</b>	<b>Lecturers (frequency)</b>	<b>Percentage</b>	<b>Students (frequency)</b>	<b>Percentage</b>
CD – ROM	28	87.5*	51	85.0*
Computers	32	100*	60	100*
Facsimile	3	9.4	15	25
Internet	30	93.8*	58	96.7*
Printer	32	100*	59	98.3*
Digital camera	17	53.1*	49	81.7*
Scanner	29	90.6*	55	91.7*
Projector multimedia	29	90.6*	58	96.7*
GSM/Telephone	31	96.9*	57	95*
Electronic mail	27	84.4*	50	83.3*
Satellite technology	9	28.1	31	51.7*
Radio	20	62.5*	56	93.3*
Magazine	25	78.1*	58	96.7*
Bulletin	25	78.1*	52	86.7*
Posters	24	75.0*	58	96.7*
Leaflet	20	62.5*	49	81.7*
Flash drive	28	87.5*	58	96.7*
Newspaper	23	71.9*	51	85.0*
Photocopy machine	31	96.9*	58	96.7*

(\* Available)

**Table 2 a. Respondent's level of competence in ICT facilities**

ICTs facilities	Lecturers (M)	S.D <sub>1</sub>	Students (M)	S.D <sub>2</sub>
CD – ROM	2.38*	0.78	1.94*	0.94
Computers	2.63*	0.49	2.50*	0.54
Facsimile	0.83	1.01	0.54	0.87
Internet	2.69*	0.47	2.65*	0.52
Printer	2.55*	0.57	2.33*	0.73
Digital camera	1.87*	0.97	2.20*	0.73
Scanner	2.13*	0.82	2.07*	0.78
Projector multimedia	2.13*	0.83	1.93*	0.83
GSM/Telephone	2.88*	0.34	2.75*	0.60
Electronic mail	2.70*	0.53	2.34*	0.82
Satellite technology	1.07	1.11	1.30	1.01
Radio	2.28*	1.03	2.48*	0.84
Magazine	2.33*	0.80	2.50*	0.68
Bulletin	2.29*	0.90	2.28*	0.90
Posters	2.20*	0.96	2.50*	0.70
Leaflet	2.24*	0.99	2.30*	0.93
Flash drive	2.71*	0.46	2.58*	0.72
Newspaper	2.35*	0.80	2.42*	0.70
Photocopy machine	2.44*	0.62	2.47*	0.72

(\* Competent)

**Table 2 b. Level of competence in computer skills**

Computer skills	Lecturers mean	S.D <sub>1</sub>	Students mean	S.D <sub>2</sub>
Using windows explorer to manage files	1.58*	0.56	1.57*	0.65
Saving files in personal and general directories	1.71*	0.46	1.77*	0.46
Recovery of accidentally deleted files	1.41*	0.76	1.51*	0.57
Cutting/copying and pasting between applications	1.69*	0.54	1.82*	0.43
Minimizing, maximizing and resizing windows	1.63*	0.61	1.83*	0.38
Saving and arranging files in a folder	1.63*	0.49	1.70*	0.53
Converting word document to PDF documents	1.39*	0.80	1.31*	0.75
Creating shortcuts to the desktop	1.50*	0.67	1.62*	0.61
Downloading, installing and updating antivirus	1.38*	0.71	1.43*	0.65
Defragmentation of drive C (hard disk)	0.63	0.71	0.98	0.75
Switching between applications	1.16*	0.69	1.51*	0.63

(\* Competent)

On the average, students in the selected institutions are more competent in using ICT facilities than their lecturers, this could be as a result of the student's educational demand to meet up with the requirements of the various courses they need to pass before they could become certified graduate, thus, making them to explore the various ICTs more than the lecturers. The institution should therefore, provide more ICT trainings for the lecturers in other for them to

meet up to the level and have higher ICT competency as compared to the students.

### 3.3 Perceived Benefits of the Use ICTs to Your Work as a Lecturers or a Student

Entries in Table 3 reveal the benefits of ICTs as perceived by the respondents. All the listed benefits were useful to the respondents. And they included: such as Provides opportunities for

connection between the school and the world (M=1.69, Students M=1.73); Create Opportunities to collaborate on assignments with people outside or inside school (Lecturers M=1.63, Students M=1.73); Help create economic viability for tomorrow's workers (M=1.28, Students M=1.90); Facilitating the acquisition of basic skills (Lecturers M=1.67, Students M=1.80), Support innovation in the workflows, processes and tools used to create, share, publish, visualize, and connect the outputs of agricultural science and the people engaged in it (Lecturers M=1.50, Students M=1.75), Higher quality lessons through greater collaboration between teachers in planning and preparing resources (Lecturers M= 1.53, Students M=1.66); Improvement of teaching conditions and enables most effective resource sharing (Lecturers M=1.59, Students M=1.63), Extend the generation and dissemination of data and information content that is widely accessible and

is licensed to be easily re-used and applied (Lecturers M=1.61, Students M=1.58); Enhancing teacher's training(M=1.59); Help relate school experiences to work practices (M=1.59, Students M=1.59); More focused teaching, tailored to students' strengths and weaknesses, through better analysis of attainment data (Lecturers M=1.41, Students M=1.42); Contributes to radical (excellent) changes in school (M=1.13, Students M=1.49).

The most useful benefits to the respondents included: Helping researchers to source more information for their work (Lecturers M=1.81, Students M=1.81), Improved research and published work (Lecturers M= 1.81, Students M=1.77), Accelerate, enrich, and deepen skills (M=1.74) Motivate and engage students in learning (Lecturers M=1.77, Students M=1.73), Time saving (Lecturers M=1.69, Students M=1.80).

**Table 2 c. Level of competence in internet and online usage**

<b>Internet and online skills</b>	<b>Lecturers mean</b>	<b>S.D<sub>1</sub></b>	<b>Students mean</b>	<b>S.D<sub>2</sub></b>
Connecting to the internet	1.58*	0.56	1.92*	0.28
Using the internet competently	1.61*	0.56	1.77*	0.43
Knowing how to set up default home page	1.06*	0.81	1.42*	0.62
Knowing how to set up preferred default home page	1.06*	0.85	1.40*	0.62
Knowing how to use search engines	1.75*	0.51	1.88*	0.32
Knowing how to find required relevant information	1.75*	0.44	1.82*	0.39
Knowing how to download, install and update softwares	1.50*	0.62	1.67*	0.54
Knowing where to put URL in the browser to find a particular webpage	1.31*	0.74	1.58*	0.65

(\* Competent)

**Table 2 d. Level of competence in other ICTs usage**

<b>Other ICT skills</b>	<b>Lecturers mean</b>	<b>S.D<sub>1</sub></b>	<b>Students mean</b>	<b>S.D<sub>2</sub></b>
Creating and sending e-mails	1.66*	0.55	2.07*	2.65
Replying and deleting or forwarding e-mails	1.59*	0.67	1.68*	0.50
Adding contacts to contact list	1.50*	0.67	1.80*	0.48
Attaching a word document or picture to an e-mail and sending as attachment	1.56*	0.62	1.58*	0.67
Sending SMS/MMS with mobile phones	1.81*	0.40	1.87*	0.34
Backing up work to flash drive and CD	1.53*	0.67	1.63*	0.58
Burning of typed document/Video on a CD-ROM/DVD	1.44*	0.67	1.37*	0.69
Recording a lecture using radio set	1.22*	0.75	1.62*	0.67
Playing a recorded video on a television	1.53*	0.62	1.55*	0.67
Operating the projector	1.38*	0.66	1.29*	0.70
Printing a typed document	1.69*	0.54	1.77*	0.53
Scanning a printed document	1.31*	0.64	1.50*	0.65
Operating fax machine and sending facsimile	0.41	0.67	0.54	0.81

(\* Competent)



**Table 3. Perceived benefits of the use ICTs**

<b>Benefits</b>	<b>Lecturer</b>	<b>S.D</b>	<b>Student</b>	<b>S.D</b>
Accelerate, enrich, and deepen skills	1.77*	0.43	1.73*	0.49
Provides opportunities for connection between the school and the world.	1.69*	0.54	1.73*	0.45
Motivate and engage students in learning	1.75*	0.44	1.73*	0.45
Help relate school experiences to work practices	1.45*	0.62	1.52*	0.57
Help create economic viability for tomorrow's workers	1.28*	0.63	1.90*	2.70
Contributes to radical changes in school	1.13*	0.75	1.49*	0.60
Extend the generation and dissemination of data and information content that is widely accessible and is licensed to be easily re-used and applied.	1.61*	0.50	1.58*	0.59
Facilitating the acquisition of basic skills	1.44*	0.50	1.80*	1.42
Support innovation in the workflows, processes and tools used to create, share, publish, visualize, and connect the outputs of agricultural science and the people engaged in it	1.50*	0.57	1.75*	0.44
Enhancing teacher's training	1.59*	0.50	1.59*	0.59
More focused teaching, tailored to students' strengths and weaknesses, through better analysis of attainment data	1.41*	0.56	1.42*	0.56
Improved research and published work	1.81*	0.40	1.77*	0.50
Help researchers to source more information for their work.	1.81*	0.40	1.81*	0.39
Create Opportunities to collaborate on assignments with people outside or inside school.	1.63*	0.55	1.73*	0.52
Higher quality lessons through greater collaboration between teachers in planning and preparing resources.	1.53*	0.62	1.66*	0.51
Improvement of teaching conditions and enables most effective resource sharing.	1.59*	0.50	1.63*	0.52
Time saving	1.69*	0.54	1.80*	0.40

(\* Benefits)

The results of the study suggest that respondents generally perceived online resources to be useful in their work. The implication of this finding is that teaching and research are likely to be enhanced in an environment where there is a positive perception concerning online resources usage [26]. The study is also in conformity with the findings of [27,28].

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research [29]. A great deal of research has proven the benefits to the quality of education [30]. ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change [31,32,29]. The benefits of ICTs on Agricultural development can never be overemphasized. ICTs directly and indirectly affect poverty alleviation, notably in relation to rural development and food security. Examples include the delivery of market or employment information, or the creation of well-paid jobs that eventually "trickle down" to poor communities [33].

### **3.4 Conclusion and Implication for Agricultural Education**

This study has revealed that all the listed ICT facilities were available except facsimile (Lecturers 9.4%, Students 25%) and satellite technology (Lecturers 28.1%, Students 51.7%). But the most available, and used ICT facilities in the institution include: Computer, printer, internet, G.S.M, photocopying machine, scanner and projector. The lecturers has high level of competence in the use of some facilities like GSM/Telephone, Flash drive, Electronic mail, Internet, Computers and printer, while the students has high level of competence in the use of GSM/Telephone, internet, computers, flash drive, posters and magazines. Both the respondents (lecturers and students has no competence in the use of satellite technology and facsimile. All the listed benefits were useful to the respondents as their standard deviation are not far from the mean. Helping researchers to source more information for their work, improving research and published work, accelerate, enrich, and deepen skills, motivate and engage students in learning, time saving were perceived as the most useful benefits

to the respondents. It is therefore recommended that the university must aim to ensure accessibility, availability and reliability of ICT facilities so that every lecture room and staff offices have ICT facilities especially computers linked to internet and have equipment appropriate for accessing a range of electronic resources, also university lecturers and students should be exposed to series of training and development skills in the use of these high technology facilities such as satellite and fax machine as they will help to facilitate distant learning. The ministry of education should liaise with the ministry of agriculture and provide Supportive infrastructures such as electricity and telecommunication services. The use of Information and communication Technology is changing the face of teaching, learning and research. Therefore, constant research, evaluation, and assessment should be carried out to make sure that ICT facilities are used effectively in agricultural faculties.

### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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