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Utilization of ICT for Enhanced Service Delivery in Agricultural Education in Higher Educational Institutions in Cross River State

[1]**Elizabeth Akwenaboye Udie**
Udie266@gmail.com

[1]**Victor Atah Abanyam**
vabanyam@gmail.com

[1]**Andeshi Liwhuliwhue Agwu**
andeshiagwu@gmail.com
[1]*Department of Vocational Education*
University of Calabar, Calabar

Abstract
The study adopted descriptive survey research design to ascertain the areas of ICT utilization for enhancing service delivery in agricultural education in higher institutions in Cross River State. The study had 3 purposes, 3 research questions and 3 hypotheses. The population of the study was 87 respondents. All the members of the population were used for the study. The instrument for data collection was a structured questionnaire titled UIEAESDQ. The instrument was validated by three experts in Agricultural Education and Measurement and Evaluation in the College of Education of Michael Okpara University of Agriculture, Umudike. The reliability of the instrument was established as .84 using Cronbach alpha technique. Data collected were analysed using mean, standard deviation and z-test. It was found from the result of the study that the areas of ICT utilization for enhancing service delivery are: instructional delivery (16 items), academic research (15 items) and administration (16 items). It was therefore concluded that there are 47 areas of ICT utilization for enhancing service delivery in Agricultural Education in higher institutions. Among the recommendations made were that school administrators should fully adopt modern ICT facilities to enhance service delivery in schools.
Keywords: service, delivery, agricultural, education, ICT, utilization

Introduction

The continuous need for improvement in any field of study can never be over emphasized, this necessitated the various programmes and activities geared towards delivering better services in order to enhance the overall system. Agricultural education programmes require continuous review and update to ensure they are meeting their curriculum objectives and that they are relevant to the global and local demands. Formal programmes in agricultural education are conducted at primary and secondary schools, colleges and universities with the objective of producing agricultural scientist who are both competent in theory and practice of agriculture. In order to achieve the above

objectives, there is need to enhance the overall process of teaching and administration in the departments of agricultural education across all higher institution levels through better service delivery.

Service delivery is an organized provision of services to the achievement of identified group objectives. Lovelock and Wright (2012) defined service delivery as the actual delivery of service and products to the customer or clients. Edidiong and Enyene (2014) opined that service delivery has undergone significant metamorphosis from purely traditional modular manual service to a more dynamic technologically driven system. Agricultural education, just like other disciplines, requires many activities ranging from teaching, evaluation administration, resource management, research and so on. Chen et al. (2009) pointed out that service delivery is critical for organizational success. Service delivery in the context of this study is the process of administration and teaching of agricultural education in higher institutions in Cross River State. However, for an organization to carry out the activities required for the achievement of its objectives, there is need to enhance service delivery through the introduction of innovative ideas to spice up the process.

Chen et al (2009) opined that enhancing the quality of service delivery in organizations and institutions requires the introduction of innovation such as Information and Communication Technology (ICT) to ensure continuous improvement in the quality of the programme and its outcome. ICT refers to technologies that provide access to information through telecommunications. This includes the Internet, wireless networks, cell phones, and other communication media. ICT in education is the mode of education that uses communications technology to support, enhance, and optimize the delivery of information. Worldwide research has shown that ICT can lead to an improved student's learning and better teaching methods. Francis (2012) defined ICT as the technologies that allow immediate retrieval of stored information from across the globe through the combination of internet gadgets utilized with computers and other enabling facilities (Anu, Kapil & Seema, 2011). ICT utilization is the effective application of ICT in the process of running educational activities. This has become the mainstream of any institution that must maintain and move in keeping with the global trend and the continuous demand for better service delivery by clients or students as the case may be. It could therefore be concluded in this study that effective ICT utilization cycles around some major components which are: general administration, instructional delivery, research and programme /product evaluation.

Administration refers to activities relating to the management of higher education institutions which is often mentioned in other studies as managerial activities in higher education institutions. The integration of ICT into the process of school administration processes enhances the overall admission activities of higher education institutions by making it more accessible to many (Thomas, Kwaku & Obeng, 2004). The important items identified under this category relates to the automation of admission process through e-media including admission enquiry by students and applying for admissions

through electronic media. Magni (2009) asserted that ICT in administration entails using computers, course allotment, and availability of information like timetable/classs schedule in electronic form and attendance monitoring/maintenance through e-media. Administration done through ICT helps in processing of voluminous records in a quick manner, thereby making data retrieval easier (Thomas, Kwaku & Obeng, 2004). It includes communication between the important stakeholders of the system such as sending e-circulars to students, faculty and staff (Hasan et al, 2007).

Another notable area of ICT utilization in agricultural education programme in higher institutions is teacher-to-student instructional delivery. This is the most important of all the cycles of utilization of ICT in education as ICT tools have been the major medium by which classroom instruction are communicated recently especially in this period where the whole world is clamoring for transformation from physical to online learning due the effect of the coronavirus pandemic. This ranges from planning the instruction through sourcing of instructional materials till the actual delivery of lesson. Bhawna (2021) asserted that computer based test are used to determine learners' aptitude before setting learning objectives, and that computer Microsoft Word can be used to break course plan into components. Budi (2012) opined that the advent of technology has assisted teachers in sourcing instructional materials which has before now posed a huge threat to instructional delivery. Various ICT-enabled platforms have continued to emerge for the purpose of holding meetings and lessons for groups and students. Examples of such platforms are the whatsapp, Facebook, zoom, blogging, integrated learning module (ILM), podcast etc. Any of these ICT-enabled tools can be employed for instructional delivery by a competent teacher with sufficient computer skills. Goi (2007) asserted that ICT can be utilized for instructional delivery through the adoption of online teaching strategies such as video conferencing, group or private whatsapp chat, etc (Kamal, 2005). In a closer and more common perspective, the ongoing school on-radio programme being adopted by many State government in Nigeria, the television programme, the online teaching being emphasized in universities recently are all evidence of the need of ICT in instructional delivery.

Furthermore, the need for research has become particularly necessary since higher institutions are meant basically to research for solutions to societal problems. Research is an integral part of any higher institution programme including agricultural education. Before the advent of ICT, sourcing for information has been a great threat to researchers. The most significant of ICT use in research is data analysis using computer applications such as Statistical Package for Social Sciences (SPSS), Matlab, Sci lab etc (Nkanu, 2008). The utilization of ICT in research can be categorized into three; these include pre-data analyses, data analyses and post data analyses. More so, the social media platforms have really changed the narrative of modern academic research as information can be easily sought from several associations' platforms relevant to one's need. Virtually all academic disciplines including agricultural education now has whatsapp or facebook group or both where members come together to share ideas and disseminate relevant information in their field of study. One cannot imagine the level of

information and knowledge gotten from these platforms to ease research process. Advert on research paper publications has recently focused on online platforms due to wider circulation within a shorter period of time. One could imagine the level of plagiarism that would have been recorded among researchers if not the ICT powered plagiarism dictator. Paper publication is gradually moving from paper-only to paper and online publications with more emphasis on online-only publication due to its easy verification and accessibility globally (Akpan-Atata, 2013).

Statement of the problem

The advent of several ICT powered facilities has modernized the running of school programme both in academic and administration. Academic conferences, classroom instructional delivery and evaluation can now be conveniently carried out using online platforms such as zoom, facebook, whatsapp, teleconferencing, etc. In many developed countries, school programmes have been successfully started and finished without physical contact with the administrators, teachers, or students. Many institutions have begun to see the opportunities provided by ICT especially as the world is struck by the deadline coronavirus, making physical gathering impossible as a way out of the situation.

Despite the opportunities provided by ICT in the running of educational programmes in the world today, many institutions in developing countries such as Nigeria are yet to utilize these opportunities. Many institutions in Cross River State are still yet to explore the potentials provided by ICT in running their agricultural education programmes. This is evidenced by the fact that all the schools' activities ranging from instructional delivery, administration and research presentation still rely on physical meeting alone despite other alternatives and strategies being provided through ICT. Education programme in Nigeria is still at this low level because of the inability to fully integrate ICT in the system. Many lecturers and school administrators still limit their utilization of ICT to typing and printing of documents while living in ignorance of numerous other trending ICT opportunities utilized by their colleagues in other developing countries. There seems to be a gap between the higher institution staff and the knowledge of the various trending opportunities provided by ICT hence the need for this study.

Purpose of the study

The purpose of this study is to determine the areas in which ICT could be deployed for enhancing service delivery in agricultural education in higher institutions in Cross River State. Specifically, the study tends to determine:

1. the areas of ICT utilization in instructional delivery
2. the areas of ICT utilization in academic research
3. the areas of ICT utilization in administration

Research questions

The following research questions were answered by the study:

1. What are the areas of ICT utilization in instructional delivery?

2. What are the areas of ICT utilization in academic research?
3. What are the areas of ICT utilization in administration?

Hypotheses

The following hypotheses were tested for the study at 0.05 level of significance:

Ho1: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in instructional delivery.

Ho2: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in academic research.

Ho3: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in administration.

Methodology

Survey research design was adopted for this study, because it involved the use of questionnaire to collect data from a representative sample which was generalized on the entire population. The area of the study is Cross River State located in South – South, Nigeria. The place was chosen for the study because there are sufficient numbers of agricultural education lecturers and administrative staff to respond to the questionnaire. The population for this study was 87 persons comprising 46 Agricultural education lecturers and 41 administrative staff in the three higher institutions that offer the programme in the State. Census sampling was adopted as all the members of the population were used since they were accessible and manageable.

The instrument for data collection for this study was a structured questionnaire titled "Utilization of ICT for Enhanced Agricultural Education Service Delivery Questionnaire" (UIEAESDQ), containing 47 items. The questionnaire was divided into sections A, B, C, and D. Section A dealt with information on the relevant personal characteristics of the respondents while section B-D dealt with the actual answers to the research questions. The questionnaire had a four points rating scale of Strongly Agreed (S.A) 4 points, Agreed (A) 3 points, Disagreed (D) 2 points and Strongly Disagreed (S.D) 1 point that applies to section B-D of the questionnaire. The draft copy of the instrument was validated by three experts in Agricultural Education and Measurement and Evaluation in the College of Education of Michael Okpara University of Agriculture, Umudike. The reliability of the instrument was established using Cronbach alpha technique and an internal consistency of .84 was obtained, which proves that the instrument is highly reliable for the study. Data were collected through contact with the lecturers and administrative staff using three research assistants to distribute and retrieve the questionnaire.

All copies of the instrument were retrieved and analyzed using mean and standard deviation for research questions and z-test for hypotheses. A cut off point of 2.50 was established and any item mean below this point was rejected while those from the point and above were accepted as the area of utilization of ICT for enhancing service delivery in agricultural education. For hypotheses testing, the null hypothesis of any item was not rejected if the calculated value is less than the table value which is 1.98 but was not

accepted if the calculated value is higher than the table value at 0.05 level of significance.

Presentation of results

Research question 1: What are the areas of utilizations of ICT in instructional delivery?

Ho1: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in instructional delivery.

Table 1: Mean rating and z-test result of Lecturers and Administrators on the areas of Utilization of ICT in instructional delivery

S/N	ITEM STATEMENT	$\bar{x}_1$	S_1	$\bar{x}_2$	S_2	$\bar{x}_g$	S_g	z-cal	Rmks
1	Use of ICT tools in planning instruction	3.05	.75	3.00	.73	3.03	.74	.60	NS
2	Use of ICT tools in sourcing instructional delivery	2.99	.73	2.91	.73	2.95	.73	.12	NS
3	Utilization of integrated learning module (ILM) for teaching	3.21	.79	3.20	.79	3.20	.79	.11	NS
4	Utilization of blogs in teaching/learning	3.57	.89	3.54	.88	3.56	.89	.28	NS
5	Utilization of zoom video conferencing in teaching and learning from distant places	3.32	.82	3.30	.82	3.31	.82	.22	NS
6	Utilization of podcast for learning	3.31	.82	3.29	.81	3.30	.82	.22	NS
7	Utilization of projectors in teaching/learning	3.28	.81	3.25	.80	3.27	.81	.33	NS
8	Broadcasting of materials online using facilities such as CD ROM, internet, computers etc	3.13	.77	3.09	.76	3.11	.77	.47	NS
9	Utilized to facilitate communication to students with special needs	3.05	.75	3.00	.73	3.03	.74	.60	NS
10	Utilization of electronic toys to develop special awareness and psychomotor control	3.17	.78	3.15	.77	3.16	.78	.23	NS
11	Utilization of online resources such as email, chat, discussion forum to support collaborated writing and sharing of information	2.89	.78	2.86	.69	2.88	.74	.39	NS
12	Utilization of online facilities to promote blended learning	2.99	.73	2.91	.73	2.95	.73	.12	NS
13	Use of social media platforms such as facebook, watsapp, twitter etc for effective instructional delivery	3.09	.76	3.07	.75	3.08	.76	.24	NS
14	Use of audio sets such as radio for instructional delivery	3.49	.87	3.47	.86	3.48	.87	.21	NS
15	Use of audio-visuals such as television for effective instructional delivery	3.51	.87	3.49	.87	3.5	.87	.21	NS

16	Use of ICT tools such as automated system in instructional and programme evaluation	2.98	.73	2.97	.72	2.98	.73	.12	NS

Keys: $\bar{x}_1$ - mean for lecturers, $\bar{x}_2$ - mean for administrators, *S1* - standard deviation for lecturers, *S2* - standard deviation for administrators, $\bar{x}$g - grand mean, *S*g - grand standard deviation, NS - Not significant

The data presented in Table 1 shows that all the items had their mean ranging from 3.56 to 2.88 which were all above the cut off mean of 2.50. This means that all the items are the areas of ICT utilization in instructional delivery in Agricultural Education. The result shows that the standard deviations are at close range, meaning that the responses of all the respondents are not far from one another. The result also shows that all the items had their calculated value less than the table value which is 1.96 thereby upholding the null hypothesis stated. This means that there is no significant difference between the mean responses of lecturers and administrators on the areas of utilization of ICT in instructional delivery.

Research question 2: What are the areas of ICT utilization in academic research?

Ho2: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in academic research.

Table 2: Mean rating and z-test result of Lecturers and Administrators on the areas of ICT Utilization in Academic Research

S/N	ITEM STATEMENT	$\bar{x}_1$	S_1	$\bar{x}_2$	S_2	$\bar{x}$g	Sg	z-cal	Rmks
1	Use of internet to access relevant literatures	3.35	.83	3.20	.79	3.28	.81	1.64	NS
2	Use of computer software to identify appropriate information source	2.98	.73	2.95	.72	2.97	.73	.37	NS
3	Use of internet for content research	3.43	.85	3.35	.83	3.39	.84	.85	NS
4	Use of SPSS for qualitative data analyses	3.25	.80	3.11	.76	3.18	.78	1.59	NS
5	Use of internet for literature tracking	3.38	.84	3.30	.82	3.34	.83	.86	NS
6	Use of ICT facilities such as phone, email etc for data collection	3.29	.81	3.25	.80	3.32	.81	.45	NS
7	Use of computer softwares such as SPSS, matlab, sci lab, winks etc for quantitative	3.41	.85	3.29	.81	3.40	.83	1.28	NS

	data analyses								
8	Use of computer for referencing or bibliographic compilation	3.35	.83	3.20	.79	3.28	.81	1.64	NS
9	Use of social media groups for article discussion among researchers	3.28	.81	3.25	.80	3.27	.81	.33	NS
10	Use of computer software such as turnitin, plagiarism checker etc to detect plagiarism	2.97	.72	2.95	.72	2.96	.72	.25	NS
11	Use for internet website, email etc to submit research paper	3.44	.85	3.40	.84	3.42	.85	.42	NS
12	Use of computer for journal paper review or editing	3.15	.77	3.14	.77	3.15	.77	.46	NS
13	Use of computer for research paper reporting	3.34	.83	3.32	.82	3.33	.83	.22	NS
14	Use of computer software for data management	3.21	.79	3.17	.78	3.19	.79	.42	NS
15	Use of projectors for research paper reporting	3.15	.77	3.10	.76	3.13	.77	.59	NS

Keys: $\bar{x}_1$ – mean for lecturers, $\bar{x}_2$ - mean for administrators, *S1*- standard deviation for lecturers, *S2* - standard deviation for administrators, $\bar{x}$g - grand mean, *S*g - grand standard deviation NS - Not significant

The result presented in table 2 shows that all the items had their mean ranging from 3.42 to 2.96 which were all above the cut off mean of 2.50. This means that all the items are the areas of ICT utilization in academic research for enhancing service delivery in Agricultural Education. The result shows that the standard deviations are at close range, meaning that the responses of all the respondents are not far from each other. Data presented also shows that all the items had their calculated value less than the table value which is 1.96 thereby upholding the null hypothesis stated. This means that there is no significant difference between the mean response of lecturers and administrators on the areas of ICT utilization in academic research.

Research question 3: What are the areas of ICT utilization in administration?

Ho3: There is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in administration.

Table 3: Mean rating and t-test result of Lecturers and Administrators on the areas of ICT Utilization in Administration

S/N	ITEM STATEMENT	$\bar{x}_1$	S_1	$\bar{x}_2$	S_2	$\bar{x}_g$	S_g	t-cal	Rmks
1	Use of computer for online application and enrolment of students	3.52	.88	3.50	.87	3.51	.88	.21	NS
2	Use of computer to prepare school announcements	3.41	.85	3.39	.84	3.40	.85	.21	NS
3	Use of social media platforms to communicate information or announcement	3.28	.81	3.26	.81	3.27	.81	.22	NS
4	Use of computer to prepare school reports	2.98	.73	2.95	.72	2.97	.73	.37	NS
5	Use of internets and projectors to deliver school reports	3.53	.88	3.50	.87	3.52	.88	.36	NS
6	Use of computer for financial reports such as balance sheet, pay slip, non-salary grants, audit report, etc	3.19	.79	3.15	.77	3.17	.78	.46	NS
7	For online application by staff	3.31	.82	3.28	.81	3.29	.82	.33	NS
8	Use of computers to record staff registration by the head of department	3.43	.85	3.40	.84	3.42	.85	.32	NS
9	Use of computer for preparation of staff evaluation chart	3.39	.84	3.35	.83	3.37	.84	.43	NS
10	For analyses of staff evaluation results	3.21	.79	3.20	.79	3.20	.79	.11	NS
11	Use of social media platforms for individual or group communication	3.57	.89	3.54	.88	3.56	.89	.28	NS
12	Use of computer and internet for overall record and storage of school data	3.43	.85	3.39	.84	3.42	.85	.42	NS
13	To process documents by typesetting, designing etc.	3.28	.81	3.25	.80	3.27	.81	.31	NS
14	Use of printers to print documents when needed	3.52	.88	3.50	.87	3.51	.88	.21	NS
15	To prepare staff duty roaster and specification using automated duty roaster computer application	3.27	.81	3.23	.79	3.25	.80	.37	NS
16	Use of social media or other internet powered platforms to host administrative meeting	2.97	.72	2.95	.72	2.96	.72	.25	NS

Keys: $\bar{x}_1$ – mean for lecturers, $\bar{x}_2$ - mean for administrators, S_1 - standard deviation for lecturers, *S2* - standard deviation for administrators, $\bar{x}$g - grand mean, *S*g - grand standard deviation NS - Not significant

The data presented in table 3 shows that all the items had their mean ranging from 3.52 to 2.96 which were all above the cut off mean of 2.50. This means that all the items are the areas of utilization of ICT in administration for enhancing service delivery in Agricultural Education. The result shows that the standard deviations are at close range, meaning that the responses of all the respondents are not far from each other. The data also shows that all the items had their calculated value less than the table value which is

1.96 thereby upholding the null hypothesis stated. This means that there is no significant difference between the mean response of lecturers and administrators on the areas of utilization of ICT in administration.

Discussion of the findings

The findings of the study in research question one revealed that there are 16 areas of ICT utilization in instructional delivery in Agricultural Education. This finding is in line with Goi (2007) who found that ICT can be utilized for instructional delivery through the adoption of online teaching strategies such as video conferencing, group or private whatsapp chat, etc.

The findings of the study in research question two revealed that there are 15 areas of ICT utilization in academic research for enhancing service delivery in Agricultural Education. This finding is in consonance with Akpan-Atata (2013) who found that ICT is utilized in every part of academic research as no component of research thesis, journal article, and any known academic research work can do without ICT tools or gadgets.

The findings of the study in research question three revealed that there are 16 areas of ICT utilization in administration for enhancing service delivery in Agricultural Education. This finding is in line with Thomas, Kwaku and Obeng (2004) who found that integration of ICT into administrative process enhances the overall admission activities of higher education institutions by making it more accessible to many. In line with the study also Magni (2009) rightly pointed that ICT is utilized in school administration through the use of computer for online application and enrolment of students, use of computer to prepare school announcements, use of social media platforms to communicate the information or announcement, use of computer to prepare school reports, use of internets and projectors to deliver school reports, use of computer for financial reports such as balance sheet, pay slip, non-salary grants, audit report, etc.

Conclusion

Based on the result of the data collected, analysed and the findings made, it was concluded that there are 47 areas of ICT utilization in enhancing service delivery in agricultural education. They are 16 items in instructional delivery, 15 items in academic research and 16 items in administration. The findings show that service delivery in higher institutions have transformed from manual to highly sophisticated level utilizing all emerging trends in ICT for efficiency.

Recommendations

Based on the result and findings of the study, it was recommended as follows:

1. All schools offering agricultural education programmes should compulsorily adopt the use of blended instructional method by combining both online and offline teaching methods.
2. Lecturers should explore the trending ICT facilities in carrying out their research activities.

3. School administrators should fully adopt modern ICT facilities to enhance service delivery in schools.
4. Government through the Ministry of Education in collaboration with school management should provide sufficient ICT facilities to be utilized for service delivery in schools.
5. All school staff both academic and non-academic should update themselves with the techniques in the application of ICT facilities to enhance their respective service delivery.

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