



## Effectiveness of Information and Communication Technologies for Learning Activities among Students of College of Agricultural Sciences, Olabisi Onabanjo University, Ago Iwoye, Ogun State, Nigeria

<sup>1</sup>Mufutau, R.A., <sup>2</sup>Ogungbayeri, G.B., <sup>3</sup>Osunmakinde, M.A., <sup>1</sup>Fadipe, M.O. and <sup>4</sup>Olanloye, S.A.

<sup>1</sup>Department of Agricultural Extension and Rural Sociology; <sup>2</sup>Department of Home Science and Hospitality Management;

<sup>3</sup>Department of Agricultural Economics and Farm Management;

<sup>4</sup>Department of Animal Production, College of Agricultural Sciences, Olabisi Onabanjo University, Yewa Campus, Ayetoro, Ogun State, Nigeria

\*Corresponding author's email: [mufutau.adeniyi@oouagoiwoye.edu.ng](mailto:mufutau.adeniyi@oouagoiwoye.edu.ng)

### Abstract

The study assessed the effectiveness of ICT for learning among students of the College of Agricultural Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria. A two-stage sampling procedure was used to select 127 respondents in the study area. The questionnaire was used to collect data on respondents' socio-economic characteristics, available ICT gadgets, extent of use of ICT among respondents, the effectiveness of ICT for learning activities and constraints militating against the effectiveness of ICTs. Descriptive statistics such as frequency distribution, percentage and mean were employed in analyzing the data while inferential statistics such as Chi-square and PPMC were used in testing hypotheses at  $p \leq 0.05$  level of significance. Results revealed that respondents had a mean age of 25.11 years and were male (66.9%). The majority (96.9%) were single with an average household size of 2 members. Projectors (90.6%), internet-enabled devices (87.4%) and computers (81.9%) were some of the available ICT gadgets. Internet-enabled devices (66.9%) were always used by respondents and ICT was effective (80.3%) in teaching and learning activities. Also, maintaining and upgrading students' intelligence ( $\bar{x} = 2.28$ ), save lecture time ( $\bar{x} = 2.20$ ) and ability to access information anytime and anywhere ( $\bar{x} = 2.14$ ) were the major indicators of ICT effectiveness. Furthermore, the unavailability of some ICT gadgets in school ( $\bar{x} = 1.72$ ) and lack of ICT equipment or infrastructure for office and administrative use ( $\bar{x} = 1.60$ ) were perceived constraints which rendered ICT ineffective. Respondents' sex ( $\chi^2 = 10.198$ ) and age ( $r = 0.195$   $p < 0.05$ ) were significantly related to the level of effectiveness of ICT in the study area. The study concluded that there was a high level of effectiveness of ICT in the study area. It is recommended that the government and other stakeholders provide the required ICT resources for improved learning activities in the study area.

**Keywords:** Information Communication Technology, Learning, and Effectiveness

### Introduction

Across the world, Information and Communication Technology (ICT) is without a doubt a significant source of innovation and successful teaching-learning activities. It is the application of computers to retrieve, transmit and manipulate data, in education or other systems. One of the most vital contributions of ICT in education is easy access to the learning and teaching process (Sharma *et al.*, 2011). It is an umbrella concept that includes any communication device such as radio, television, smartphones, computer and network hardware and software, and satellite systems as well as the various applications associated with them, such as video conferencing and learning (Iwu & Anulobi, 2010).

ICTs are often used in education, healthcare, libraries, and security (Iwu & Anulobi, 2010). It is noteworthy that ICT application has evolved into a crucial component of university students' learning processes both inside and outside of the classroom. Over the past two decades, the government and other education-related players, including university administration and researchers, have committed millions of naira to ICT adoption (Lawrence, 2015). The majority of colleges that have completely embraced ICT have seen enormous advancements in the use of ICT to enhance learning strategies, teaching, research, and development. However, it is unclear what effect ICT applications have on students' performance and

achievement. In the current study, ICT is interpreted as a gradual transition to automation of the educational process that includes not only the creation of a tailored Learning Management System (LMS) and the transfer of all the courses and their associated data there, but also administrative tasks like student admission, registration, and evaluation.

According to a widely held belief, ICT improves the quality of education by shifting the focus of teaching and learning from being heavily teacher-dominated to student-centred, which will lead to increased learning for students and provide opportunities for them to improve their communication, creativity, problem-solving, and informational reasoning skills (Khan *et al.*, 2015). ICTs are widely regarded as a contemporary technology that gives teachers the ability to change their pedagogical approaches to improve student learning and accomplishment. ICT, in its broadest sense, refers to any product that stores, retrieves, manipulates, transmits, or receives information digitally. According to Mbaeze, Ukwandu, and Anudu (2010), ICT consists of hardware, software, social networks, media, information processing, and presentation. ICT is a scientific, technological, and engineering discipline, as well as a management approach, according to UNESCO (2008). It is used to handle information in applications and associations with social, educational, and cultural aspects. To organize and improve educational programs, teachers and students can benefit from the integration of information and communication technology.

The practice of learning with the aid of Information and Communication Technologies (ICT) is widely used today. Young people today are surrounded by and absorbed in technology, including smartphones, computers, tablets, and gaming consoles (Prensky, 2010). Despite the rapid adoption of ICT in Nigerian classrooms, its impact on lecturers' and students' performance in higher education institutions remains unclear. The usefulness of ICT in teaching-learning activities for both students and lecturers has not been unified by earlier studies. Kirkpatrick and Cuban (1998) questioned the impact of computer use on students' academic achievement. According to Agarwal and Day (2000), effective Internet utilization enables the adoption of small-class interactive tactics in bigger classrooms and improves student achievement. Additionally, it has been demonstrated that using technology in conjunction with tasks that demand higher-order thinking abilities (HOTS), such as analyzing or assessing material or developing new knowledge representations, can help students learn (Polly, 2011). Based on the identified research gaps and the problem, the study assessed the effectiveness of ICT for teaching-learning activities among students and staff of the College of Agricultural Sciences, Olabisi Onabanjo University, Ayetoro Campus, Ogun State, Nigeria. The general objective of the study was to assess the effectiveness of ICT for teaching and learning among students and staff of the College of Agricultural Sciences, Olabisi Onabanjo University, Ago-Iwoye,

Ogun State, Nigeria. The specific objectives are to:

- i. describe the socio-economic characteristics of the respondents in the study area;
- ii. identify the available ICT gadgets in the study area;
- iii. ascertain the extent of use of ICT among respondents in the study area;
- iv. investigate the effectiveness of ICT for teaching-learning activities among respondents in the study area;
- v. investigate the constraints militating against the effectiveness of ICT in the study area.

#### ***Hypotheses of the study***

**HO<sub>1</sub>:** There is no significant relationship between the effectiveness of ICT and the socio-economic characteristics of the respondents.

**HO<sub>2</sub>:** There is no significant relationship between the effectiveness of ICT and its constraints.

#### **Methodology**

##### ***The study area***

The study was carried out in the College of Agricultural Sciences, Olabisi Onabanjo University, Ago-Iwoye Ogun State, Nigeria. Olabisi Onabanjo University (formerly known as Ogun State University) was founded on the 31st of January, 1983. It is an autonomous public institution established by the Ogun State Government with the sole purpose of providing higher education in humanities, science and technology. The school operates a multi-campus system with a total of five (5) campuses which are located in Ago-Iwoye, Ayetoro, Ikenne, Ibogun and Sagamu with Ago-Iwoye being the permanent site. College of Agricultural Science was established on 1<sup>st</sup> October 1983 in Ayetoro, Yewa North Local Government Area. It has two (2) faculties which are the Faculty of Agricultural Management and Rural Development (FAMARD) and the Faculty of Agricultural Production and Renewable Resources. The Faculty of Agricultural Management and Rural Development comprises three departments which are the Department of Agricultural Economics (AEC), Agricultural Extension and Rural Sociology (AXR) and Home and Hotel Management (HHM) while the Faculty of Agricultural Production and Renewable Resources consist of four (4) departments namely; Department of Animal Production (ANP), Crop Production (CRP), Forestry and Wildlife Management (FWM) and Fisheries Management (FSM). This summed up to seven (7) departments in the College of Agricultural Sciences, Olabisi Onabanjo University.

##### ***Population of the Study***

The population of this study comprised all the students of the College of Agricultural Sciences, Olabisi Onabanjo University, Ago-Iwoye Ogun State.

##### ***Sampling techniques and sample size***

A two-stage sampling procedure was used for this study. First, 50% of the seven departments in the College of Agricultural Sciences were selected; this produced four departments (AEC, AXR, ANP and CRP) across the two

faculties in the College. Second, 12% of 1,021 students across selected departments produced a total number of 127 students which constituted a sample size for the study.

## Results and Discussion

### *Socio-economic characteristics of the respondents*

The distribution of respondents based on socio-economic characteristics is shown in Table 1. Results revealed that the majority (63.8%) of the respondents were within the age range of 24–27 years. The mean age of the respondents was 25.11 years. This implies that the respondents were very young people and could easily adopt ICT as a medium for teaching-learning activities in the study area. Majority (66.9%) of the respondents were male. This suggested more use of ICT among male counterparts compared with female folks. Majority (96.9%) of the respondents were single. The high percentage of single respondents signified that marriage was not common among university students in the study area. This could imply that respondents were not financially buoyant to go into marriage in the study area. Majority (64.6%) of the respondents had an average household size of 2 members. The result signifies that respondents are likely to have roommates. This could be a result of the high rate of rent imposed on accommodation in the study area. Majority (64.6%) of the respondents practised Christianity as a religion.

### *Availability of ICT gadgets in the study area*

The distribution of respondents based on the availability of ICT gadgets in the study area is shown in Table 2. The results revealed that the majority of the respondents agreed that projectors (90.6%), internet-enabled devices (87.4%), computers (81.9%) and flash disc/ storage devices (79.5%) were some of the available gadgets in the study area. This could imply that these gadgets are made available due to their great importance towards teaching and learning in the study area.

### *The extent of use of ICT among respondents in the study area*

The distribution of respondents based on the extent of use of ICT among respondents in the study area is shown in Table 3. The results revealed that internet-enabled devices (66.9%) were always used by respondents while computers (56.7%) and projectors (52.1%) were sometimes used by respondents in the study area. This could imply that without these gadgets teaching and learning activities could be affected in the study area.

### *Effectiveness of ICT for teaching-learning activities among students and staff*

The distribution of respondents based on the effectiveness of ICT for learning activities among students is shown in Table 4. Results revealed that maintaining and upgrading students' intelligence ( $\bar{x} = 2.28$ ), save lecture time ( $\bar{x} = 2.20$ ), ability to access information anytime and anywhere ( $\bar{x} = 1.79$ ) and bringing about motivation to academic performance ( $\bar{x} = 1.62$ ) were the major areas of effectiveness of ICT in the study area. This implies that the impact of ICT was

felt by students in one way or the other as a result of its availability in the study area.

### *Constraints militating against the effectiveness of ICT in the study area*

The distribution of respondents based on constraints militating against the effectiveness of ICT in the study area is shown in Table 6. Results revealed that unavailability of some ICT gadgets in the school ( $\bar{x} = 1.72$ ), lack of ICT equipment or infrastructure for office and administrative use ( $\bar{x} = 1.60$ ), inadequate supply of relevant and appropriate software ( $\bar{x} = 1.38$ ), inadequate training on the use of ICT ( $\bar{x} = 1.32$ ) and high cost of power supply ( $\bar{x} = 1.17$ ) were the very serious constraints affecting the effectiveness of ICT in the study area. This could imply that the school management lacks logistic support from the government which therefore could reduce the effective functioning of ICT in the study area.

### *H<sub>0</sub>: There is no significant relationship between the effectiveness of ICT and the socio-economic characteristics of the respondents*

The results of the hypothesis test of the relationship between the effectiveness of ICT and the socio-economic characteristics of the respondents in the study area are shown in Table 7. The results revealed that a significant relationship existed between sex ( $\chi^2=10.198$ ;  $p \geq 0.05$ ) and the level of effectiveness of ICT. This indicates that sex determined the level of effectiveness of ICT in the study area. Results in Table 8 showed that age ( $r=0.195$   $p < 0.05$ ) had a significant relationship with the level of effectiveness of ICT in the study area. This implies that age influenced the effectiveness of ICT in the study area.

### *H<sub>0</sub>: There is no significant relationship between the effectiveness of ICT and its constraints*

Spearman ranked the correlation of the relationship between the effectiveness of ICT and its constraints as revealed in Table 9. Results show that there is significant relationship between effectiveness of ICT and constraints such as lack of ICT equipment or infrastructure for office and administrative use ( $r=0.291$ ), inadequate supply of relevant and appropriate software ( $r=0.207$ ), unavailability of some ICT gadgets in the school ( $r=-0.238$ ), electricity failure ( $r=-0.666$ ), high cost of internet data ( $r=0.560$ ), lack of interest in the job by lecturers ( $r=-0.194$ ) and high cost of power supply ( $r=-0.483$ ).

## Conclusion

The study concluded that there was a high level of effectiveness of ICT for teaching and learning among students of the College of Agricultural Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria. The unavailability of some ICT gadgets in the school, lack of ICT equipment or infrastructure for office and administrative use, inadequate supply of relevant and appropriate software, inadequate training on the use of ICT and high cost of power supply were the very serious constraints affecting the effectiveness of ICT in the

study. Sex and age were significantly related to the level of effectiveness of ICT in the study area.

### Recommendations

Based on these findings, it was recommended that:

- i. The government should provide the required ICT resources or gadgets that will be used for teaching and learning in the study area.
- ii. ICT professionals such as software and computer engineers should be employed to manage and maintain the ICT equipment for teaching and learning in the study area.
- iii. Training and re-training programmes in the integration of ICT in curriculum and instruction should be organized for ICT managers and instructors for success in teaching and learning in the study area.
- iv. The government should improve infrastructural facilities like electricity to make ICT work in universities to improve teaching and learning.

### References

Agarwal R. and Day, A. E. (1998). The Impact of the Internet on Economic Education, *Journal of Economic Education*, 29(2): 99-110.

Igwe D.O. (2012). The Roles of ICT Development in Open and Distance. Education. Achievements, Prospects and Challenges. *African Journal of Teachers Education*, 2(2): 1- 14.

Iwu, A.O. and Anulobi, J. C. (2010). Utilization of Information and Communication Technologies (ICTs) in Effective Curriculum Implementation in National Open University of Nigeria South East Geo-Politics Zone. *Journal of Educational Media and Technology*, 14(2): 1-11.

Khan, M. S., Khan, I., Siraj-u-Din, Ismail, H. M., Khattak, R. and Jan, R. (2015). The impacts of ICT on the student's performance: A review of access to information. *Research on Humanities and Social Sciences*, 5(1).

Kirkpatrick, H. and Cuban, L. (1998). Computers Make Kids Smarter—Right?, *TECHNOS Quarterly for Education and Technology*. 7(2), 1–11.

Lawrence J.E (2015). “Examining the factors that influence ICT adoption in SMEs: a research preliminary findings,” *International Journal of Technology Diffusion (IJTD)*, 6(4): 40–57.

Mbaeze, I. C., Ukwandu, E. and Anudu, C. (2010). The Influence of Information and Communication Technologies on Students' Academic Performance. *Journal of Information Technology Impact*, 10(3): 129-136.

Polly (2011). Developing Students' Higher-Order Thinking Skills (HOTS) through Technology Rich Tasks: The Influence of Technological Pedagogical and Content Knowledge (TPACK). *Educational Technology*. 51(4): 20-26.

Prensky, M. R. (2010). Teaching digital natives: Partnering for real learning. Corwin Press, USA.

Sharma, A., Gandhar, K., Sharma, S. and Seema, S. (2011). Role of ICT in the Process of Teaching and Learning. *Journal of Education and Practice*, 2(5): 1-6.

United Nations Educational, Scientific, and Cultural Organization, Paris (France). (2008). ICT competency standards for teachers: Competency standards modules. ERIC Clearinghouse.

**Table 1: Distribution of respondents by socio-economic characteristics in the study area (n = 127)**

Personal Characteristics	Frequency	Percentage	$\bar{x}$
Below 20 years	2	1.6	
20-23 years	32	25.2	
24-27 years	81	63.8	25.11
28-30 years	8	6.3	
Above 30 years	4	3.1	
<b>Sex</b>			
Male	85	66.9	
Female	42	33.1	
<b>Marital status</b>			
Single	123	96.9	
Married	4	3.1	
<b>Family size</b>			
1-2 persons	82	64.6	
3-4 persons	40	31.5	2.09
5-6 persons	5	3.9	
<b>Religion</b>			
Christianity	82	64.6	
Islam	44	34.6	
Traditional	1	0.8	

Source: Field survey, 2021

**Table 2: Distribution of respondents by availability of ICT gadgets in the study area (n=127)**

ICT gadget	Yes		No	
	Freq	%	Freq	%
Computers	104	81.9	23	18.1
Facsimile	32	25.5	95	74.8
Internet-enabled devices (e.g. smartphones)	111	87.4	16	12.6
Printer	70	55.1	57	44.9
Digital Camera	51	40.2	76	59.8
Scanner	25	19.7	102	80.3
Multimedia Projector	115	90.6	12	9.4
Telephone	13	10.2	114	89.8
CD – ROM	52	40.9	75	59.1
Text magnifier	32	25.2	95	74.8
Flash disc/storage devices	101	79.5	26	20.5
Web board	12	9.4	12	9.4

*Source: Field survey, 2021*

**Table 3: Distribution of respondents by extent of use of ICT among respondents in the study area (n=127)**

ICT gadget	Extent of use of ICT					
	Always		Sometimes		Never	
	Freq	%	Freq	%	Freq	%
Computers	18	14.2	72	56.7	37	29.1
Facsimile	5	3.9	20	15.7	102	80.3
Internet-enabled devices (e.g. smartphones)	85	66.9	30	25.6	12	9.4
Printer	11	8.7	42	33.1	74	58.3
Digital Camera	16	12.6	22	17.3	89	70.1
Scanner	16	12.6	9	7.1	102	80.3
Multimedia Projector	48	37.8	67	52.1	12	9.4
Telephone	0	0.0	13	10.8	114	89.8
CD – ROM	24	18.9	28	22.2	75	59.1
Text magnifier	13	10.2	19	12.0	95	74.8
Flash disc/storage devices	41	32.3	61	48.0	25	19.7
Web board	0	0.0	12	10.6	114	89.8

*Source: Field survey, 2021*

**Table 4: Distribution of respondents by effectiveness of ICT for teaching-learning activities among students and staff (n=127)**

Effects of ICT	Very effective		Effective		Less effective		Not effective		$\bar{x}$
	Freq	%	Freq	%	Freq	%	Freq	%	
Ability to access information anytime and anywhere	70	55.1	19	15.0	24	18.9	14	11.0	2.14
Overcoming lecturer's anxieties about teaching	19	15.0	31	24.4	25	19.7	52	40.9	1.13
Allowing lecturers to experiment with technology	32	25.5	27	21.3	31	24.4	37	29.1	1.43
Networking with other teachers and schools	19	15.0	13	10.2	31	24.4	64	50.4	0.90
Maintaining and upgrading students' intelligence	76	59.8	25	19.7	12	9.4	14	11.0	2.28
Promote active learning and authentic assessment	37	29.1	52	40.9	12	9.4	26	20.5	1.79
Engage students by motivation and challenge	25	19.7	38	29.9	27	21.3	37	29.1	1.40
Investigate reality and build student knowledge	51	40.2	25	19.7	25	19.7	26	20.5	1.80
Increase collaboration and cooperation between students and lecturer	12	9.4	26	20.5	26	20.5	63	49.6	0.90
It brings about motivation for academic performance	25	19.7	53	41.7	25	19.7	24	18.9	1.62
It saves lecture time	63	49.6	39	30.7	13	10.2	12	9.4	2.20
Increase learner independence	13	10.2	38	29.9	51	40.2	25	19.7	1.31

Source: Field survey, 2021

**Table 5: Categorization of the level of effectiveness of ICT in the study area (n = 127)**

Effectiveness level	Frequency	Percentage	Mean	SD
Low	25	19.7		
High	102	80.3	0.80	0.40
<b>Total</b>	<b>127</b>	<b>100.0</b>		

Source: Field survey, 2021

**Table 6: Distribution of respondents by constraints militating against the effectiveness of ICT in the study area (n=127)**

Constraints	Major		Minor		Not a constraint		$\bar{x}$
	Freq	%	Freq	%	Freq	%	
Lack of ICT equipment or infrastructure for office and administrative use	88	69.3	27	21.3	12	9.4	1.60
Teachers' incompetency in ICT skills	13	10.2	38	29.9	76	59.8	0.50
Inadequate supply of relevant and appropriate software	75	59.1	25	19.7	27	21.3	1.38
Unavailability of some ICT gadgets in the school	103	81.1	12	9.4	12	9.4	1.72
Electricity failure	37	29.1	25	19.7	65	51.2	0.78
High cost of internet data	52	40.9	25	19.7	50	39.4	1.02
Inadequate training on the use of ICT	64	50.4	39	30.7	24	18.9	1.32
Lack of interest in the job by lecturers	13	10.2	76	59.8	38	29.9	0.80
Lack of skilled manpower to manage available systems	12	9.4	50	39.4	65	51.2	0.58
High cost of power supply	61	48.0	27	21.3	39	30.7	1.17

Source: Field survey, 2021

**Table 7: Summary of Chi-square analysis of some selected socio-economic characteristics of the respondents and level of effectiveness of ICT in the study area**

Socio-economic variables	$\chi^2$ -Value	Df	p-value	Remarks
Sex	10.198	1	0.001	Significant
Marital status	2.401	1	0.121	Not Significant
Religion	4.691	2	0.096	Not Significant

*Source: Field Survey, 2021; Significant at the 0.05 level (2-tailed)*

**Table 8: Summary of correlation analysis of some selected socio-economic characteristics of the respondents and level of effectiveness of ICT**

Variables	r	p-value	Remark
Age	0.195*	0.028	Significant
Household size	0.058	0.515	Not Significant

*Source: Field Survey, 2021; Significant at the 0.05 level (2-tailed)*

**Table 9: Summary of correlation analysis of the relationship between the effectiveness of ICT and its constraints**

Constraints	r-values	p-values
Lack of ICT equipment or infrastructure for office and administrative use	.291*	.001
Teachers' incompetency in ICT skills	-.029	.747
Inadequate supply of relevant and appropriate software	.207*	.019
Unavailability of some ICT gadgets in the school	-.238*	.007
Electricity failure	-.666*	.000
High cost of internet data	.560*	.000
Inadequate training on the use of ICT	-.100	.263
Lack of interest in the job by lecturers	-.194*	.029
Lack of skilled manpower to manage available systems	-.173	.052
High cost of power supply	-.483*	.000

**Source: Field Survey, 2021; \*Significant @0.05 level**