AVAILABILITY AND UTILIZATION OF INFORMATION COMMUNICATION TECHNOLOGY IN ELECTRICAL/ELECTRONIC TECHNOLOGY IN TERTIARY INSTITUTIONS IN EKITI STATE, NIGERIA

Adameji, James Oluwasola
Department of Vocational and Technical Education
Faculty of Education, Ekiti State University, Ado Ekiti, Nigeria
adamejiolusola@gmail.com

Abstract
This survey research assessed the availability and utilization of information communication technology in electrical/electronic technology in tertiary institutions in Nigeria. Specifically, the awareness of ICT components among lecturers and students, the availability of ICT resources in the vocational and technical Education department, the extent of usage of ICT among lecturers and students and the application of ICT to school teaching and learning were studied. Three research questions and two null hypotheses guided the study. Population of the study was 405 respondents comprising of 40 lecturers and 365 electrical and electronics students of the four tertiary institutions in Ekiti State, Nigeria. Due to population size, all the lecturers were sampled while simple random sampling technique was used to select a total of 160 students from the four tertiary institutions. A four-point Likert type questionnaire was used for data collection. Mean statistic were used to answer the research questions while t-test and analysis of variance were used to test the null hypotheses at 0.05 level of significance. Results showed that ICT facilities were fully available and utilized in electrical and electronic technology in tertiary institutions.

Keywords: Teaching and learning, ICT, Availability and utilization, Electrical and electronics, Tertiary institutions

Introduction

The rapid growth in the use of computers and computer-based technologies during the past two decades have similarly had an impact on the educational system around the world, and has become a part of life for many. Teaching and learning is all about communication between the lecturer and the learner. Teaching can be seen as a process of giving information, while learning is a process of receiving and synthesizing information. That is why a learned person is said to be informed. Since the evolution of Information and Communication Technologies (ICT), the giving and receiving of information have not remained the same. Information and communication technologies in today's world refers to those tools that determine the efficiency and effectiveness with which we communicate and the devices that allow us to handle information (National Open University 2012).

ICT is associated with the most sophisticated and expensive computer-based technologies, (Kaino, 2017). It also encompasses the more conventional technologies such as radio, television and telephone technology. While definitions of ICT are varied, it might be useful to accept for this study the definition provided by the United Nations Development Programme (UNDP) that ICT is basically information-handling tools – a varied set of goods, application and services that are used to produce, store, process, distribute and exchange information (UNDP, 2016). They include both the 'old' ICT devices such as radio, television and telephone and the 'New' ICT such as computers, satellite wireless technology and internet.

ICT in education encompasses a great range of rapidly evolving technologies such as desktops, notebook and handled computers; digital cameras; local area networking; the internet and the world wide web; CD ROMs and DVDs; and applications such as word processors; spreadsheets; tutorials; simulations; electronic mails; digital libraries; computer mediated conferencing; video conferencing; and virtual reality, (Ugwu and Oboegbulem (2011). Information and Communication

Technologies also includes projectors, radio, television, telephone and other equipment with their accessories and applications that help to pass messages from a message sender to the intended receiver without undue distortion. Yusuf (2017) explained that a great deal of research has proven the benefit of ICT to the quality of education. Adoni and Kpangbam (2018) outlined ICT equipment to include computers, the internet, broadcasting technologies and telephone.

Successful assimilation of ICT in the tertiary institutions system depends largely on availability of ICT facilities. Equally important is the attitude and competence of lecturers towards the use of these modern technologies in teaching. It is essential for ICT to be integrated in teaching strategies for integrating technology into teaching Electrical/Electronics. Availability of ICT facilities as teaching instrument avail every student the opportunity to work with ICT gadgets (Ajayi and Ekundayo, 2019). Usage of Information and Communication Technologies helps to enhance and encourage creativity in lecturers and this applies also to instruction in Social Electrical/Electronics. In line with these thoughts, Akuegwu (2011) asserts that ICT has the prospect to speed up, improve and deepen lecturers' skills, and motivate them; help to relate school proficiency and contribute to radical changes in schools in order to strengthen teaching. There is therefore need to use ICT to strengthen teaching in Electrical/Electronic Technology. Hence, use of ICT facilities in teaching will only be possible when they are available and accessible. Moreover, Agbo (2015) opines that lack of access to ICT facilities when needed hinders majority of lecturers from using it in teaching. This implies that access to ICT facilities is requisite for lecturers' effective and adequate use of ICT in teaching Electrical/Electronic technology in tertiary institutions.

Moreover, Agbo (2015) opines that lack of access to ICT facilities when needed hinders majority of lecturers from using it in teaching. This implies that access to ICT facilities is requisite for Lecturers' effective and adequate use of ICT in teaching electrical/electronic in tertiary institutions. Availability of valuable Information and Communication Technology facilities in teaching and adequate utilization of the facilities add greatly to quality in education. Availability of current ICT facilities for instance, computer and other peripherals are essential for teaching in recent time. Okeke (2013) is of the opinion that the key instrument to education development is the computer. This means that computer remains the key technology available for modern teaching. The success of teaching through the use of ICT facilities is mostly dependent on the availability of facilities. With the development of technology, lecturers need to adapt to the modern facilities and improve their receptiveness, skills, and competencies in the use of ICT in teaching electrical/electronic competently in the classroom (Ike, 2014). Utilization of available ICT facilities will not be adequately engaging unless the learners have the understanding, capability and courage to incorporate and use it in their daily work (Okogu, 2011).

By introducing ICT to teaching and learning, students are exposed to and interact with other expert learners and other novice learners to develop understanding and further their knowledge. They do not have to rely on the limitations of one teacher; they can interact with peers and other experts to gain new information and to intensify their knowledge base. It helps the students study independently and experience discovery learning. Students' learning is made more robust and their knowledge and understanding increases where ICT is used in ways that promote learners to work together and where the lecturer is less high-minded (**Selinger 2015)**. ICT have the capacity to solve the problem of illiteracy and perk up the quality of education at all levels, through multimedia tools such as simulations and models and other projections. Effective use of ICT in schools guarantees more access to information and experience in this era of globalization (Ugwu & Oboegbulem (2011). In other words, there is an important link between education and ICT in a knowledge seeking society, like ours, in order to meet the challenges of the 21st century. Information and communication technologies have brought about a "personalized, just-in-time, up-to-date and user-centred educational activities" into the global teaching and learning

processes (Haddad & Draxler 2012). It can enhance learners' understanding of precepts that they previously may have considered very difficult.

Utilization of facilities suggests the reasonable use of available resources to an enterprise especially in education sector for effective execution of school curriculum. Utilization according to Hornby (2015) is to use something especially for a practical purpose. Amalu (2015) defines utilization as the means of using items to improve educational practice. Thus, utilization of available ICT facilities in teaching refers to the method of using ICT strategies in improving the value and practice of teaching in tertiary institutions. Utilization of ICT facilities involves various methods which include systematized feedback, computer-based operation/network, video conferencing and audio conferencing, internet and computer assisted instruction (Ajayi, 2018). Utilization of ICT is the arrangement and circulation of instructional content through electronic teaching in order to improve learning and communication (Yusuf, 2017). This signifies that when available ICT facilities are properly utilized, it comprises current tools for inspiring teaching, learning and conducting research. Utilization according to Ngurukwem (2015) refers to the amount of available time within which a scheme is operated in terms of educational resources usage at all levels. It becomes crucial to utilize available instructional resources especially ICT resources such as computers and other ICT peripherals in teaching electrical/electronic in both urban and rural communities in Ekiti State. Chigano (2010) opine that utilization of computers and web innovation in teaching is important evidence to teachers' capability in executing the teaching job.

According to Aggeliki, (2010), electrical technology deals with all machines, tools, devices, and systems in which a current or a flow of electrons takes place through conductors and metals. It involves the design and development of high-voltage systems and components such as motors, generators, heaters, electrical power transmission and distribution systems, radio wave and optical systems, converters, and control systems for operating light and heavy machinery. Almost all of our low or high-tech gadgets today involve the use of electrical current to operate, making electrical energy one of the most needed sources of power the world over. On the other hand, electronic technology is one of the principal branches of electrical engineering which deals with science and technology based on and concerned with the controlled flow of electrons or other carriers of electric charge, especially in semiconductor devices (Collins Discovery Encyclopedia, 2015).

Electrical/Electronic technology provides technical knowledge needed as well as the essential hands-on skills that meet the condition for achieving success in the electrical field. Electrical and Electronic Technology is the branch of engineering concerned with the practical application of electricity in all forms of human endeavour (Frank & Ryder, 2018). Electrical/Electronic Technology programme as offered in Tertiary Institution in Nigeria as an integral part of Technical Education. The institution of Nigerian National Policy on Information Technology stems from understanding ICT as an instrument that can enable the nation have access to the delivery of quality education and so help in improving the living standard of the populace (FGN 2012).

Problem of the Study

Efforts have been made to ensure that ICT facilities are available and used in tertiary institutions, though the level of uptake is still not too high. This era is technology based and it is expected that graduates of technical education be equipped with knowledge and skills that will enable them compete globally with their counterparts. ICT literacy has enhanced teaching and learning through its dynamic, interactive and engaging content, and has provided real opportunities for individualized instruction. However, findings indicated that the use of computers by academics was more on statistical analysis than on teaching. On this fact, this study is established to examine extent of the availability and utilization of ICT in the teaching and learning of electrical and electronic technology.

Research Questions

1. What are the available ICT facilities in the department of electrical/electronics in tertiary institutions?
2. What is the level of utilization of ICT facilities among electrical/electronic lecturers and students in tertiary institutions?
3. What is the level of familiarity of electrical/electronic lecturers and students with ICT concepts and components in tertiary institutions?

Hypotheses

The following hypotheses were generated for the study:

Ho1: There is no significant difference in the mean responses of tertiary institutions on the utilization of ICT for teaching and learning of electrical/electronic technology

Ho2: There is no significant difference between the mean responses of lecturers and students on the utilization of ICT for teaching and learning of electrical/electronic technology.

Methods

This is a survey research. Population of the study was 405 comprising of 40 lecturers and 365 electrical/electronics technology students of the four tertiary institutions in Ekiti State, Nigeria. A total of 200 respondents were sampled for the study. Due to the population size, all the 40 lecturers were sampled while simple random sampling technique was used to select a total of 160 students from the senior levels in the selected tertiary institutions (Ekiti State University, Ado Ekiti, Federal University, Oye Ekiti, Federal Polytechnic Ado Ekiti and Government Technical College, Ado Ekiti). A structured four-point Likert type questionnaire was adopted for data collection. Three research assistants were used to distribute and retrieve the questionnaires. Statistic Mean was used to answer research questions and items with 3.50 and above were accepted. T-test and analysis of variance were used to test the null hypotheses at 0.05 level of significance. T-test was used to find the significant difference between the mean response of lecturers and students on the assessment of availability and utilization of information communication technology in electrical/electronic technology in tertiary institutions in Ekiti State, Nigeria.

Results

Research Question 1: What are the available ICT facilities in the department of electrical/electronics in tertiary institutions?

Table 1: Descriptive Analysis of the availability of ICT facilities in electrical/electronic technology departments

S/N	ITEMS	MEAN	REMARK
1	Computers	3.65	Available
2	Internet Access	3.03	Available
3	Projectors	2.58	Not available
4	Projection Screen	2.92	Not available
5	Television Sets	3.02	Available
6	DVD/VCD Players	2.77	Not available
7	Radio Cassette Players	2.96	Not available
8	Printers	3.55	Available
9	Digital Cameras	2.07	Unavailable
10	Power Supply	3.23	Available

Table 1 above shows availability of ICT in electrical/electronic technology. Therefore, infrastructural position of electrical/electronic was encouraging for effective utilization of ICT. This results from the availability of ICT facilities in schools.

Research Question 2: What is the level of utilization of ICT facilities among electrical/electronic lecturers and students in tertiary institutions?

Table 2: Descriptive Analysis of the level of utilization of ICT facilities among electrical and electronic lecturers and students in Tertiary Institutions?

	LECTURERS			STUDENTS	
S/N	ITEM	MEAN	REMARK	MEAN	REMARK
1	Computers	3.63	Used	3.60	Used
2	Internet Access	3.78	Used	3.76	Used
3	Television Sets	2.25	Not Used	3.77	Used
4	Printers	3.58	Used	3.71	Used
5	Power Supply	3.96	Used	3.25	Used

Table 2 indicates that both lecturers and students use most of the available ICT facilities normally in their daily activities. Therefore so many people can attest to the benefit of ICT in this modern communication era.

Research Question 3: What is the level of familiarity of electrical/electronic lecturers and students with ICT concepts and components in tertiary institutions?

Table 3: Descriptive Analysis of the level of familiarity of electrical and electronic lecturers and students with ICT concepts and components in tertiary institution

	LECTURERS			STUDENTS	
S/N	ITEM	MEAN	REMARK	MEAN	REMARK
1	GSM mobile phone	3.50	Familiar	3.65	Familiar
2	Computer	3.25	Familiar	3.00	Familiar
3	Digital Camera	3.00	Familiar	3.51	Familiar
4	Power Point	2.67	Non-Familiar	2.25	Non-Familiar
5	Website	2.40	Familiar	2.42	Non-Familiar
6	Electronic Mail	3.35	Familiar	3.25	Familiar
7	Input Device	2.90	Non-Familiar	2.96	Non-Familiar
8	Internet	3.48	Familiar	3.22	Familiar
9	Output Device	2.58	Non-Familiar	3.00	Familiar
10	Networking	2.90	Non-Familiar	3.48	Familiar

The data in table 3 reveal that only six out of 10 components of ICT are known to the lecturers, while the students are acquainted with seven of them. GSM, computer, electronic mail and networking rank high in the ICT facilities that both lecturers and students are familiar with. This may result from the fact that mobile phones, computer, electronic mail, and networking are available in different shops and offices. Unfortunately, processes of using computer for communications are rated very low.

Testing of Hypotheses

Hypothesis 1: There is no significant difference in the mean responses of tertiary institutions on the utilization of ICT for teaching and learning of electrical/electronic technology

Table 4: Analysis of variance on usage of ICT for teaching and learning of electrical and electronic subjects in tertiary institutions

Variables	SS	Df	MS	α	P-Val	Decision
Between Groups	24.193	156	6.2344	0.2948	0.0739	Accept Ho
Within Groups	17.384	42	2.4847			

P>0.05 (Not Sig.)

The analysis in Table 4 indicates that there is no significant difference in the responses of the selected tertiary institutions on the utilization of ICT for the teaching and learning of electrical and electronic subjects.

Hypothesis 2: There is no significant difference between the mean responses of lecturers and students on the utilization of ICT for teaching and learning of electrical/electronic technology

Table 5: One sample T-test on the utilization of ICT for teaching and learning.

Variables	N	Mean	SD	Df	T	P-Val	Decision
Lecturers	40	3.08	0.69	198	1.06	1.96	Accept Ho
Students	160	3.14	0.55				

P>0.05 (Not Sig.)

Table 5 has indicated that there is no significant difference between the mean responses of lecturers and students on the utilization of ICT for teaching and learning of electrical and electronic subjects. The p-value (1.96) was greater than 0.05 level of significance. This means that the null hypothesis two was not rejected. Hence, there is no significant difference in responses of students and lecturers on the utilization of ICT for teaching and learning.

Discussion of Findings

This study examined the extent of the availability and utilization of ICT in the teaching and learning of electrical and electronic technology. From the analysis conducted, it was discovered that the ICT facilities available in tertiary institutions towards promoting the teaching of electrical /electronic technology include computers, internet access, television sets, printers and power supply. All these ICT components are made available to enhance effective teaching and learning of electrical/electronic technology towards achieving sustainable technological advancement in the economy. This finding is in line with the conclusion of Ugwu and Oboegbulem (2011) and Agbo (2015) that ICT facilities are highly available to tertiary institutions.

Also, it was disclosed that the available ICT facilities are adequately utilized by the electrical/electronic students and lecturers in tertiary institutions. This might be attributed to the fact that ICT facilities ease the teaching and learning process in the educational sector. Tis finding corroborate the discovery of Yusuf (2017) that ICT facility are adequately utilized in tertiary institutions to boost the teaching and learning processes.

Furthermore, it was discovered that most of the ICT components are known to the electrical/electronic lecturers and students. Some of these ICT components are GSM, computer, electronic mail, networking, output devices, website and lost more. This may result from the fact that mobile phones, computer, electronic mail, and networking are available in different shops and offices. In today's digital age, technology has become ubiquitous, with devices such as mobile phones (GSM), computers, and networking equipment being readily available in various shops and offices. This widespread availability ensures that individuals, including lecturers and students in the electrical/electronic field, are exposed to these technologies from an early stage. This finding supports the conclusion of Agbo (2015) that ICT components are highly acknowledged by both the students and lectures in tertiary institutions.

In addition, it was discovered that there is no significant difference in the responses of the selected tertiary institutions on the utilization of ICT for the teaching and learning of electrical and electronic subjects. This might be because all the selected tertiary institutions have similar access to ICT resources, including computers, software, internet connectivity, and electronic devices, ensuring equitable opportunities for utilizing ICT in teaching and learning. And these institutions employ similar pedagogical approaches and strategies for integrating ICT into the teaching and learning process. This consistency ensures that the utilization of ICT is standardized across different institutions, leading to comparable responses. This finding disagreed with the conclusion of Ajayi (2018) that a significance different exist between the level of ICT utilizations among tertiary institutions in Nigeria.

Finally, it was discovered that there is no significant difference between the mean responses of lecturers and students on the utilization of ICT for teaching and learning of electrical and electronic subjects. Both lecturers and students may perceive the utilization of ICT for teaching and learning in similar ways. They might agree on the effectiveness, relevance, and impact of ICT tools and resources in enhancing the learning experience and facilitating knowledge acquisition in electrical and electronic subjects. Also, lecturers and students may have similar experiences and exposure to ICT tools and resources within the context of teaching and learning electrical and electronic subjects. They might share comparable levels of proficiency in using ICT, leading to aligned perceptions and attitudes towards its utilization. This discovery supports the conclusion of Ajayi and Ekundayo (2019) that no significant difference exist between lecturers and students regarding level of ICT utilization.

Conclusion

Based on the findings of this study, it can be concluded that computers, internet access, television sets, printers and power supply are ICT facilities that are available in electrical/electronic technology departments and that lecturers and students are familiar with computer, mobile phone, digital camera and internet.

Recommendations

Based on the findings of this study, the following recommendations are made:

- Government should provide adequate fund for the procurement of ICT facilities through Tertiary Education Trust Fund to enhance the quality teaching in the tertiary institutions
- School authority should be made to provide ICT facilities and every department of electrical/electronics should be made beneficiaries of such ICT projects.
- Computer/ICT education should be made compulsory for all electrical/electronics students.
- Skills in ICT should be a prerequisite for employing lecturers of electrical and electronic subjects and provisions should be made to train those who are already in the service in ICT skills.

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