

# Impact of Information Communication Technology on Academic Performance of Physics Students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria

**AWODUN, Adebisi Omotade (Ph. D.)**

Department of Physics,  
College of Education, Ikere-Ekiti, Ekiti State,  
Nigeria.

**AJISOLA, Kola T.**

Department of Computer Science,  
College of Education, Ikere-Ekiti, Ekiti State,  
Nigeria.

Received May 27, 2016

Accepted June 14, 2016

## ABSTRACT

The study investigated the impact of Information Communication Technology on academic performance of Physics students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria. The study adopts descriptive survey of research design. The population for this study consists of all students in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Stratified random sampling technique was used to select used to select 20 Physics students each from part I, part II and part III respectively among the students of College of Education, Ikere-Ekiti, Ekiti State of Nigeria. A total of sixty (60) NCE Physics students were used as samples for the study. Three research questions were raised and tested at 0.05 level of significance. The instrument for the study was self-designed questionnaire. The data collected were analysed using Chi-Square ( $X^2$ ) statistical analysis package. The results of the analyses showed that availability of ICT facilities influences academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State. The result also showed that utilization of ICT facilities influences academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Finally, analysis of the data collected also revealed that utilization of ICT facilities influences academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Based on the findings of the study, conclusion and recommendations were made.

**Key Words:** Information, Communication, Technology, ICT and College of Education

## 1. Introduction

The mandate of the teacher training programme at the Nigeria Certificate Education (NCE) level, which is the recognized minimum teaching qualification in Nigeria, is to produce quality teachers for the Basic Education (NCCE, 2012). The philosophy of the Nigeria Certificate Education (N.C.E), Physics is inspired by the desire to help students become intellectually informed in Physics, and by the need to produce competent and effective teachers with good mastery of content and method, and knowledge of the development of the learner. According to NCCE (2012) the products should be able to apply acquired knowledge to Information Technology and real life situations and also to use Information Technology (IT) effectively to support pupils/students learning Physics.

The entire world has been metamorphosed into a global village by Information and Communication Technology (ICT). Nwachukwu (2004) viewed information and communication technology in three categories: computer, storage media and telecommunication. Information and Communication Technologies (ICTs) are now of no doubt, being accepted as part of our contemporary world as they are perceived as tools for rapid changes in technology, schools, political and global economic transformation. The penetrating influence of ICT is not only limited to these spheres of human endeavor but also to the field of education where it is perceived as a transforming agent in education delivery and educational methodology. The use of Information and Communication Technology (ICT) is

becoming an integral part of Education in many parts of the globe. Nigeria is not left behind as ICT gradually finds its way into the Educational systems despite limitations brought about by economic disadvantages.

Kwache (2007) perceived information and communication technology to have the potential to accelerate, enrich and deepen skills; to motivate and engaged students in learning; to help create economic viability for tomorrow workers; contribute to radical changes in schools; to strength teaching and to provide opportunities for connecting between the schools and the world. Information Technology is the use of electronic devices or equipment, most especially computers, for storing, analyzing and sending out data. Communication is the activity or process of expressing or sending ideas and feelings or of giving people information.

Similarly, Adamu (2004) asserted that Information and Communication Technology (ICT) is a diverse set of technological tools and resources used to communicate, disseminate, store and manage information. He further stressed that information and communication technology includes the prints (magazines, newspapers, book etc) and the electronics (radio, television, video tapes, internet, tape players and recorders, fax machines, telephone, satellite device computer) etc. Information and Communication Technology (ICT) comprises the method and technical means of capturing, storing, processing, receiving, and transmitting both the data and information.

Physics students' learning ability and performance in Physics hinges seriously on the ability of Physics teachers in the utilization of modern gadgets in Information and Communication Technology. There is the need for physics teacher to be exposed to the ICT in other for him to be able to teach and guide the students. ICT can be used in teaching different areas of physics like optics, heat, sound and waves, electricity, atomic physics etc if students are exposed to different ICT materials during the cause of teaching, it will help the students to be more productive. The view is that it will lead to

more effective and efficiency in every educational process. According to Iyobhebehe and Okepurukhro (2011) application of ICT to the teaching of physics in higher institution will only be successful, if some of these challenges are tackled like ICT equipment, trained and quality teachers and personnel, preparedness by education stakeholders and infectiveness of power supply.

A careful analysis and appraisal of Physics education in Nigeria reveals some fundamental problems (Ajayi, 2008 & Adedayo, 2010); these includes curriculum content, teaching methods, teacher's quality, negative attitude of students towards Physics and teaching materials. The potential for ICT to improve the quality of instruction, transform the schools, improve school management, increase access to education, improved in teacher education among others have been emphasized by several studies (Yusuf and Yusuf, 2009). ICT holds management the opportunity to revolutionize pedagogical methods, expand access to quality science education and improve the management of education system (World Bank, 2002).

ICT has the potential for enhancing the tools and environment for learning as it allows materials to be presented for enhancing the tools and environment for learning as it allows materials to be presented in multiple media, motivate and engage students in learning process, foster enquiry and exploration, and provides access to world wide information resources among others (Yusuf and Yusuf, 2009). Through the internet, students and teachers alike can gain access to a rich source of information to keep abreast of new sources of knowledge.

The education reform act of 2007, FME (2007) clearly highlighted the need to improve the quality of instruction of Nigerian schools, provide enriched learning environment, need to provide more aces sot education and provide the students with knowledge and skills necessary for the 21<sup>st</sup> century workplace. This can be achieved through proper integration of ICT into the educational system. Through the internet, digital

libraries, teachers can easily get access to relevant and current resources in their areas.

The quality of students learning will be enhanced through their access to needed content through ICT facilities (the internet). Through ICT, science teachers, students libraries, and schools can communicate with one another and share information to enhance understanding access and view documents richly form textbooks and pictures connect colleagues, schools, friends, friends, resource person in almost all part of the world.

Okorodudu (2010) noted that wide spread availability of the internet and common access to information, freely available novel technologies and types of social interactions have inevitable impacts in learning and teaching. He asserted that e-learning using electronic devices and now technologies is a modern learning method and that e-learning system of other learning technologies are used as a supporting tool for traditional (classroom) learning without any policies.

ICT provides a bridge between-students' prior knowledge and the learning of new physical concepts, helping students develop scientific understanding through an active reformulation of their misconceptions. Specifically, they are developing their understanding about physical laws through a process of hypothesis making, and ideas testing and isolate and manipulate parameters and therefore helping them to develop an understanding of the relationships between physical concepts, variables and employ a variety of representation (pictures, animation, graphs, vectors and numerical data displays) which are helpful in understanding the underlying concepts, relations and processes and express their representations and mental models about the physical world investigate phenomena's which are difficult to experience in a classroom or lab setting because it is extremely complex, technically difficulty or dangerous, money-consuming or time consuming, or happen too fast.

According to Gambari and Chike (2010) Physics has proven its benefits to mankind as almost every human activity and virtually every

profession involves some elements of Physics. Physics education is aimed at training students to acquire proper understanding of basic principles as well as their applications and is taught at the higher institution level of the educational system in Nigeria. However, in spite of the enormous role that Physics plays in national development and the efforts of government in the provision necessary science equipments in schools with good teachers and other stakeholders like parents/guardians in providing for their children/wards at improving science education, Physics results in the examination conducted by most certified examination bodies like the West African Examinations Council (WAEC) and National Examinations Council (NECO) have not been satisfactory. Therefore, this study therefore investigated the impact of Information Communication Technology on academic performance of Physics students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria.

## 2. Research Question

1. Would the availability of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?
2. Would the utilization of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?
3. Would the compliance in the use of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?

## 3. Methodology

A descriptive survey research design was adopted for this research study on the impact of information communication technology on academic performance of NCE Physics students of Ikere College of Education, Ikere-Ekiti, Ekiti State, Nigeria.

The population for the study consists of all students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Stratified Simple random sampling technique was used to select 20 Physics students each from part I, part II and part III respectively among the students of College of Education, Ikere-

Ekiti, Ekiti State of Nigeria. A total of sixty (60) Physics students were used as samples for the study. The instrument for the study was self-designed questionnaire.

The researchers personally administered the instrument (questionnaire) on the selected

sample to elicit the relevant information needed for the study. Three research questions were raised and tested at 0.05 level of significance. The data collected were analysed using Chi-Square ( $X^2$ ) statistical analysis package.

#### 4. Results and Discussion

##### Results

##### Research Question 1

Would the availability of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?

**Table 1: Chi-Square Analysis of data on the influence of availability of ICT facilities on academic performance of students in Physics in College of Education, Ikere-Ekiti.**

S/N	ITEMS	$X^2$ -Cal	$X^2$ -tab	df	Remark
1	ICT facilities are not available in the College	16.57	7.82	3	*
2	School library are not well equipped with ICT facilities				
3	Physics laboratories and classrooms are not well-equipped with ICT facilities				
4	Availability of ICT facilities has nothing to do with learning of Physics				
5	Availability of ICT facilities in the College ICT centre inspired me to study Physics.				
6	College in general lacks modern ICT facilities.				
7	Inadequate ICT facilities in the College are affecting me negatively.				

$P < 0.05$  , \* = Significant

##### Research Question 2

Would the utilization of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?

**Table 2: Chi-Square Analysis of data on the influence of utilization of ICT facilities on academic performance of students in Physics in College of Education, Ikere-Ekiti.**

S/N	ITEMS	$X^2$ -Cal	$X^2$ -tab	df	Remark
1	Use of ICT facilities helps in effective learning of Physics.	19.27	7.82	3	*
2	Use of ICT facilities gives effective mastering of concepts in Physics.				
3	Use of ICT facilities stimulates my interest in Physics.				
4	Use of ICT facilities helps my better understanding of Physics.				
5	Use of ICT facilities in the College inspired me to study Physics.				
6	Use of ICT facilities in the College cater for individual differences learning of Physics.				
7	Use of ICT facilities in the College assists my academic performance in Physics.				

$P < 0.05$  , \* = Significant

##### Research Question 3

Would the compliance in the use of ICT facilities influence academic performance of students in Physics in College of Education, Ikere-Ekiti?

**Table 3: Chi-Square Analysis of data on the influence of compliance in the use of ICT facilities on academic performance of students in Physics in College of Education, Ikere-Ekiti.**

S/N	ITEMS	$\chi^2_{-Cal}$	$\chi^2_{-tab}$	df	Remark
1	ICT facilities expose Physics students to some practical aspects of Physics.	15.53	3.84	3	*
2	ICT facilities attract Physics students to the learning of Physics.				
3	ICT facilities stimulate my interest in Physics.				
4	ICT facilities promotes students' attitude towards Physics.				
5	With the frequent use of ICT facilities in the learning of Physics aids retention in learning.				
6	Physics could be learnt better with the use of ICT facilities..				
7	Use of ICT facilities assists my academic performance in Physics.				

$P < 0.05$  , \* = Significant

## 5. Discussion

A cursory look at table 1 reveals that  $\chi^2$ -calculated was 16.57 and  $\chi^2$ - critical was 7.82 in research question one. Showing that  $\chi^2$ -calculated is greater than  $\chi^2$ -table value at 0.05 and  $df = 3$  ( i.e..  $\chi^2_{-Cal} > \chi^2_{-tab}$  ). The result is significant; this implies that availability of ICT facilities influences academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. This result agrees with the findings of Kwache (2007) that information and communication technology to have the potential to accelerate, enrich and deepen skills; to motivate and engaged students in learning; to help create economic availability for tomorrow workers; contribute to radical changes in schools; to strength teaching and to provide opportunities for connecting between the schools and the world. The result also agrees with the findings of Iyobhebehe and Okepurukhro (2011) that application of ICT to the teaching of Physics in higher institution will be successful if some challenges like ICT equipment, trained and quality teachers and personnel, preparedness by education stakeholders and ineffectiveness of power supply are tackled.

Similarly, a cursory look at table 2 reveals that  $\chi^2$ -calculated was 19.27 and  $\chi^2$ - critical was 7.82 in research question one. Showing that  $\chi^2$ -calculated is greater than  $\chi^2$ -table value at 0.05 and  $df = 3$  ( i.e..  $\chi^2_{-Cal} > \chi^2_{-tab}$  ). The result is significant; this implies that utilization of ICT facilities influences

academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. This result agrees with the findings of Kwache (2007) that information and communication technology to have the potential to accelerate, enrich and deepen skills; to motivate and engaged students in learning; to help create economic availability for tomorrow workers; contribute to radical changes in schools; to strength teaching and to provide opportunities for connecting between the schools and the world. The result also agrees with the findings of Iyobhebehe and Okepurukhro (2011) that application of ICT to the teaching of Physics in higher institution will be successful if some challenges like ICT equipment, trained and quality teachers and personnel, preparedness by education stakeholders and ineffectiveness of power supply are tackled.

Finally, a superficial look at table 3 reveals that  $\chi^2$ -calculated was 15.53 and  $\chi^2$ - critical was 7.82 in research question one. Showing that  $\chi^2$ -calculated is greater than  $\chi^2$ -table value at 0.05 and  $df = 3$  ( i.e..  $\chi^2_{-Cal} > \chi^2_{-tab}$  ). The result is significant; this implies that compliance in the use of ICT facilities influences academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. This result agrees with the findings of Kwache (2007) that information and communication technology to have the potential to accelerate, enrich and

deepen skills; to motivate and engaged students in learning; to help create economic availability for tomorrow workers; contribute to radical changes in schools; to strength teaching and to provide opportunities for connecting between the schools and the world. The result also agrees with the findings of Iyobhebehe and Okepurukhro (2011) that application of ICT to the teaching of Physics in higher institution will be successful if some challenges like ICT equipment, trained and quality teachers and personnel, preparedness by education stakeholders and ineffectiveness of power supply are tackled.

## 6. Conclusion

Based on the results of this study, the findings revealed that: there was statistical significant relationship between the availability of ICT facilities and academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Also, there was statistical significant relationship between the utilization of ICT facilities academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Finally, there was statistical significant relationship between the compliance in the use of ICT facilities and academic performance of students in Physics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. The results of the findings strongly suggest that, ICT will significantly enhance easy delivery of physics education, teaching and learning. Also ICT will significantly provide necessary physics information for the learners on students. Furthermore ICT will significantly help the physics students to avail themselves with the opportunity of current knowledge and skills.

## 7. Recommendations

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

- Students should develop more interest in the learning of Physics through the use of ICT facilities;
- the Federal and State Government should review its National ICT policies in order to ensure effective, qualitative Physics education;

- the school management should make a provision for all Physics students to have access to the free internet facilities;
- the school management should be able to provide infrastructure facilities, most essentially into the Physics laboratories (equipment such as projector, white board etc.);
- the ministry of education should integrate ICT into Tertiary Institutions Curricula; and
- finally, government should address the problem of irregular supply of electricity in the country in order to take full advantage of the opportunities offered by ICT for qualitative Physics education in Nigeria tertiary institutions.

## References

1. Adamu, B.J. (2004). Computer application and the use of ICT for teaching and learning. A Paper presented at the train the trainer workshop for capacity building. C.O.E Akwanga, Nigeria. August 2004.
2. Adedayo, J.O. (2010). Effect of teacher's qualification on the performance of senior secondary school students. *Educational Research Association Journal*. University of Nigeria, Nsukka. 3(1).
3. Ajayi P.O. (2008): Evaluation of Instructional Materials for the Implementation of Senior Secondary School Physics Curriculum in Nigeria. *Nigerian journal of Counselling and Applied Psychology*. 4 (1). 100-110.
4. Federal Ministry of Education, FME (2007). National Policy on Education, 5<sup>th</sup> edition NERDC press. Lagos, Nigeria.
5. Gambari, A. I and Chike, O. A. (2007). Availability and utilization of Information and Communication technology (ICT) Facilities in Higher Institutions in Niger State. *Nigeria journal of the Information Technologist*. 2 (1).
6. Iyobhebehe, A. & Okepurukhro, W. (2011). Innovation in teaching and learning experiences *Asaba journal of education*. 2(1).
7. Kwache P (2007) The imperative of information and communication for teaches in Nigeria Higher Education. *MERCOT Journal of online learning and teaching*. 2 (1).

8. NCCE (2012). Nigeria Certificate in Education Minimum Standard for Sciences (2012 Edition). National Commission for Colleges of Education, Abuja. Federal Republic of Nigeria. TETF Project 2012. Produced by Department of Academic Programmes Published by: National Commission for Colleges of Education, Plot 829 Cadastral Zone AOI, Garki Abuja.
9. Nwackukwu, V.N. (2004). Information and communication technology (ICT) education for effective human resources development in Nigeria schools. *Nigeria journal of curriculum studies*. 2(1).
10. Okorodudu R.I. (2010) Innovation in teaching and learning experiences. A paper presented at the national conference organized by Nigeria council of Psychologists, College of Education (Technical) Asaba; Unpublished.
11. World Bank (2002). Information and Communication Technology: A World Bank Group Strategies Washington D.C., The World Bank Group.
12. Yusuf, M.O. & Yusuf, H.T. (2009) Educational reforms in Nigeria: The Potentials of Information and Communication Technology (ICT). Unpublished document.

**You cannot solve a problem with the same mind that created it.**

**~ Albert Einstein.**