

Influence of Information Communication Technology Facilities on Academic Performance of Mathematics Students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria

¹OJO, Olanrewaju A. & ²EGBON, Friday O.

^{1,2}Department of Mathematics,
College of Education, Ikere-Ekiti,
Nigeria.

Received May 03, 2017

Accepted May 21, 2017

ABSTRACT

The study investigated the influence of Information Communication Technology facilities on academic performance of mathematics 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 25 mathematics 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 seventy five (75) NCE mathematics 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 mathematics in College of Education, Ikere-Ekiti, Ekiti State. The result also showed that utilization of ICT facilities influences academic performance of students in mathematics 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 mathematics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. Based on the findings of the study, conclusions and recommendations were made.

Key words: Information, Communication, Technology, ICT facilities and College of Education.

Introduction

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 access to education and provide the students with knowledge and skills necessary for the 21st 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 major function of the school is teaching and learning. Effective teaching and good performance is possible if the necessary

instructional teaching facilities are available (Pepple, 2015). Izzet and Ozkan (2008) asserted that the use of good and appropriate materials in science applications makes the lesson more interesting and encouraging.

Information and communication technologies (ICT) are electronic technologies used for information storage and retrieval (Esharenana and Emperor, 2010). According to Esharana and Emperor (2010) that ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change.

Information and communication technology (ICT) is an indispensable part of the contemporary world (Yusuf, Afolabi and Loto, 2013). ICT is a force that has changed many aspects of people's ways of life. Kirschner and Weperies (2003) cited in Yusuf, Afolabi and Loto (2013) that ICT can make the school more efficient and productive, by organizing a variety of tools to enhance and facilitate teacher's professional activities.

The need for ICT in Nigerian schools cannot be overemphasized. In this technology- driven age, everyone requires ICT competence to survive. According to Adomi and Anie (2006) organizations are finding it very necessary to train and re-train their employees to establish or increase their knowledge of computers and other ICT facilities. Etejere and Ogubdele (2013) observed that electronic information system enables the teachers, researchers, school administrators, and students to acquire, process, store and disseminates vocal, pictorial, textual and numerical information by electronic based systems.

The entire world has been transformed 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) cited in Awodun and Ajisola (2016) 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.

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.

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), mathematics is inspired by the desire to help students become intellectually informed in mathematical ideas, notations and skills for logical reasoning, scientific enquiry and for the pursuit of techno-scientific education. The need to produce non-graduates but well-groomed and qualified professional teachers of mathematics for the Basic Education levels. 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 of mathematics.

Mathematics is described as a subject that affects all aspects of human life at different degrees (Maliki, Ngban and Ibu, 2009). Mathematics is a compulsory subject offered in Nigerian primary and secondary schools and is taught daily in all the schools or at least four times in a week (Chinyere, and Uche, 2013). Furthermore, Chinyere and Uche (2013) affirmed that every individual require the knowledge of mathematics to function effectively and efficiently in today's world irrespective of his/her job or profession. Mathematics encourages the habit of self-reliance and assists learners to think and

solve their problems themselves. Mathematics is a core and compulsory subject at both junior and senior secondary levels (Federal Republic of Nigeria (FGN), 2007). Odili (2006) defines mathematics as a body of knowledge, a collection of techniques and methods, the product of human activities for solving problems. Oxford Advance learners Dictionary (2001) cited in Tall, Mbwas and Abe (2011) that mathematics is the science of size and numbers (which arithmetic, algebra, trigonometry and geometry are branches).

Mathematics students' learning ability and performance in mathematics hinges seriously on the ability of mathematics teachers in the utilization of modern gadgets in Information and Communication Technology. There is the need for mathematics teacher to be exposed to the ICT in other for him to be able to teach and guide the students. ICT facilities can be used in teaching different areas of mathematics if students are exposed to different ICT facilities 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.

The potential for ICT facilities 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.

Mathematics 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. Therefore, this study therefore investigated the influence of Information Communication Technology facilities on academic performance of mathematics students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria.

Research Questions

The following research questions were raised to guide the study:

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

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

Methodology

A descriptive survey research design was adopted for this research study on the influence of Information Communication Technology facilities on academic performance of mathematics students of 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 25 mathematics 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 seventy five (75) mathematics 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.

Results and Discussion

Results

Research Question 1

Would the availability of ICT facilities influence academic performance of students in mathematics 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 mathematics 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	14.32	7.82	3	*
2	School library are not well equipped with ICT facilities				
3	mathematics laboratories and classrooms are not well-equipped with ICT facilities				
4	Availability of ICT facilities has nothing to do with learning of mathematics				
5	Availability of ICT facilities in the College ICT centre inspired me to study mathematics.				
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 mathematics 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 mathematics 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 mathematics.	17.68	7.82	3	*
2	Use of ICT facilities gives effective mastering of concepts in mathematics.				
3	Use of ICT facilities stimulates my interest in mathematics.				
4	Use of ICT facilities helps my better understanding of mathematics.				
5	Use of ICT facilities in the College inspired me to study mathematics.				
6	Use of ICT facilities in the College cater for individual differences learning of mathematics.				

7	Use of ICT facilities in the College assists my academic performance in mathematics.				
---	--	--	--	--	--

$P < 0.05$, * = Significant

Research Question 3

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

S/N	ITEMS	X ² -Cal	X ² -tab	df	Remark
1	ICT facilities expose mathematics students to solving day to day problems.	18.76	7.82	3	*
2	ICT facilities attracts mathematics students to the learning of mathematics.				
3	ICT facilities stimulate my interest in mathematics.				
4	ICT facilities promotes students' attitude towards mathematics.				
5	With the frequent use of ICT facilities in the learning of mathematics aids retention in learning.				
6	Mathematics could be learnt better with the use of ICT facilities..				
7	Use of ICT facilities assists my academic performance in mathematics.				

$P < 0.05$, * = Significant

Discussion

A cursory look at table 1 reveals that χ^2 -calculated was 14.32 and χ^2 -critical was 7.82 in research question one. Showing that χ^2 -calculated is greater than χ^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 mathematics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. This result agrees with the findings of Kwache (2007) that

information and communication technology 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 Pepple (2015) that effective teaching and good performance is possible if

the necessary instructional teaching facilities are available. Similarly, a cursory look at table 2 reveals that χ^2 -calculated was 17.68 and χ^2 - critical was 7.82 in research question one. Showing that χ^2 -calculated is greater than χ^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 mathematics 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.

Finally, a good look at table 3 reveals that χ^2 -calculated was 18.76 and χ^2 - critical was 7.82 in research question one. Showing that χ^2 -calculated is greater than χ^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 mathematics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. This result agrees with the findings of Kwache (2007) that information and communication technology have the potentials 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 Izzet and Ozkan (2008) that the use of good and appropriate materials in

science applications makes the lesson more interesting and encouraging.

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 mathematics 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 mathematics 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 mathematics in College of Education, Ikere-Ekiti, Ekiti State, Nigeria. The results of the findings strongly suggest that, ICT will significantly enhance easy delivery of mathematics education, teaching and learning. Also ICT will significantly provide necessary mathematics information for the learners on students. Furthermore ICT will significantly help the mathematics students to avail themselves with the opportunity of current knowledge and skills.

Recommendations

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

- Students should develop more interest in the learning of mathematics through the use of ICT facilities;
- the Federal and State Government should review its National ICT policies in order to ensure effective, qualitative mathematics education;
- the school management should make a provision for all mathematics students to have access to the free internet facilities;

- the school management should be able to provide infrastructure facilities, most essentially into the mathematics 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 mathematics education in Nigeria tertiary institutions.

References

1. Adomi, E.E. and Anie, S.O. (2006). An assessment of computer literacy skills of professionals in Nigerian University libraries. *Library Hi Tech News*. 23(2), 10-14.
2. Awodun, A.O. and Ajisola, K.T. (2016). Impact of Information communication technology on academic performance of Physics students of College of Education, Ikere-Ekiti, Ekiti State, Nigeria. *International Journal of Research and Analytical Review*. 3(2), 160-166.
3. Chinyere, F.O. and Uche, S.A. (2013). Nigerian Secondary Children and Mathematics phobia. How the Mathematics Teacher can Help. *American Journal of Educational Research* . 1(7), 247-251.
4. Esharenana, E.A. and Emperor, K. (2010). Application of ICTs in Nigerian Secondary school library. *Philosophy and Practice 2010*, Online. Retrieved 16/02/2017.
5. Etejere, P.A.O. and Ogundele, M.O. (2013). Computer literacy and secondary school teachers' job effectiveness in kwara state, Nkigeria. *African Journal of Teachers Education*. 3(1), 2-3.
6. Federal Ministry of Education, FME (2007). *National Policy on Education*, 5th edition NERDC press. Lagos, Nigeria.
7. Izzet, K and Ozkan, K. (2008). The effect of computer Assisted Instruction on the Achievement of students on the instruction of Physics. Topic of 7th Grade Science course at pry school. *Journal of Applied Science*. 8: 1078-1072. Institute, Denizli.
8. Kwache P (2007) The imperative of information and communication for teaches in Nigeria Higher Education. *MERCOT Journal of online learning and teaching*. 2 (1).
9. Maliki, A.E, Ngban, A.N and Ibu, J.E. (2009). Analysis of students' performance in junior secondary schools mathematics examination in Bayelsa State of Nigeria. *Students communications science*, 3(2), 131-134.
10. NCCE (2012). Nigeria Certificate in Education Minimum Standard for Sciences (2012 Edition). National Commission for Colleges of Education, Abuja. Federal Republic of Nigeria. Tef Project 2012. Produced by Department of Academic Programmes Published by: National Commission for Colleges of Education, Plot 829 Cadastral Zone AOI, Garki Abuja.
11. 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).
12. Odili, G.A. (2006). Mathematics in Nigeria Secondary School, A teaching perspective. Port- Harcourt-Rex- Charles and Patrick Ltd.
13. 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.
14. Pepple, T.F. (2015). Computer Assisted Instruction (CAI) and students' interest as Determinant of SS II Chemistry students' achievement in chemistry equilibrium in rivers state . *IOSR. Journal of Applied Chemistry*. 8(8), 50-56.
15. Tall, D.J., Mbwas, L.C. and Abe, A.S. (2011). The teaching of Mathematics in Secondary Schools as a tool for self-reliance and re-branding process in Nigeria. *Educational Research and Reviews*. 7(1), 1-4.

16. World Bank (2002). Information and Communication Technology: A World Bank Group Strategies Washington D.C., The World Bank Group.
17. Yusuf, M.O. & Yusuf, H.T. (2009) Educational reforms in Nigeria: The Potentials of Information and Communication Technology (ICT). Unpublished document.
18. Yusuf, M.A., Afolabi, F.O. & Loto, A.B. (2013). Appraising the role of information communication technology (ICT) as a change agent for higher education in Nigeria. *International Journal of Educational Administration and policy studies*. 5(8), 177-183.

An educated man is thoroughly inoculated against humbug, thinks for himself and tries to give his thoughts, in speech or on paper, some style.

~ Alan K. Simpson