IMPACT OF PEER-MEDIATED LEARNING ON ACQUISITION OF BASIC COMPUTER SKILLS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN MINNA METROPOLIS,NIGER STATE

***Ohadugha, R. O.,Nsofor C.C.& Umeh,A. E.**
Department of Educational Technology, Federal University of Technology Minna, Nigeria
Email: rosemary_ibe@yahoo.com **Phone No:** +2348063541441.

Abstract
The study examined the Impact of Peer-Mediated Learning on Acquisition of Basic Computer Skills among Senior Secondary School Students' in Minna Metropolis, Niger State. The study adopted a randomized pre-test, post-test control group design. Two hypotheses were formulated to guide the study. Purposive sampling technique was used to select four (4) Private Secondary Schools in Minna, Metropolis. Eighty (80) Students were drawn from the four Secondary Schools as sample size using stratified random sampling technique. A validated test instrument vetted by experts in Computer Science and Educational Technology Department was used for data collection. The reliability of the instrument was determined to be 0.75. t-test statistic was used for data analysis and was tested at 0.05 level of significance. The study revealed that students taught using Peer-Mediated Learning (PML) performed better than their counterpart taught using conventional teaching method. The study also revealed that there was no statistically significant difference in the mean scores of male and female students taught using PML. It was recommended that peer-mediated learning should be given emphasis in the teaching of computer among secondary schools in Niger State.

Keywords: Peer-Mediated Learning, Basic Computer Skills Acquisition, Gender.

Introduction

As Nigeria aspires to meet the vision 20:20:20 development, there is a need for proper acquisition of skills that is fully embedded in Science and Technology. As far as education chain is concerned, Danner (2013) opined that teachers serve as an important link through which the needs of the 21st Century can be met in the educational system, adding that teachers are at the fore front in leveraging technology in the society by way of using Information and Communication Technology (ICT) to improve teaching and learning. ICT driven society is a society that is consistently kept abreast with the recent happenings through technology and one of the tools of technology used to facilitate knowledge in the world is the computer (Ali, 2015). Computer systems in the educational sector has provided quick and accurate solutions to teaching and learning problems and are effective for school's instructional programs to develop, diversify, promote teaching and learning processes as oppose to traditional teaching (Sherman, 2005). The basic computer skills and knowledge an individual acquires allows such individual to perform certain tasks on the computer system (Oluwatayo 2012).It is worthy to note that without the knowledge of the computer system, students will find it challenging especially when they move to the tertiary institution where they will need the computer and the internet for their course and project works. For a student therefore, the acquisition of basic computer skills form the basic foundation and when such student can independently and effectively operate the computer and all other programs and applications loaded in the computer system, such student is regarded to be computer literate (Uniprojects, 2015).

Nigerian Government has reiterated its desire to make Nigeria a computer literate society through its National Computer Policies, stating that through the policies when implemented will enable students appreciate the potentials of using the computer and also enhance the use of computers in various works of life (Jegede & Owolabi, 2003). This agenda so far can be felt in the 2015 new national curriculum on Basic Education Programme and Implementation for Basic Science and Technology Component which introduced Computer Science as a subject in senior secondary schools calendar and its purpose is to equip senior secondary school students with computer knowledge and practical skills. This is to put them at the edge towards solving ICT problems in Nigeria and the world (Project Writers Nigeria, 2015).

The need to impact the Nigerian primary and secondary school students with the essential basic computer skills cannot be over emphasised. Unfortunately, Arugu and Chilaka, (2016) remarked that Africa and indeed Nigeria is still lagging behind in computer applications and its use and this is attributed to the following; extent of the utilization of computer facilities and packages in learning, shortage of trained personnel, unavailability of computer facilities and use of outdated computers in schools/maintenance

culture, irregular power supply in the country, overpopulated classrooms and the lack of preparedness to use the computer systems by teachers. Furthermore, Brent (2005) argued that the ability of students to acquire the proper skill lies strictly on the instructional strategy used, adding that in any learning process, students' activity should be emphasised more than the instruction. This is in line with Garrett (2008) who noted that poor academic performance at the secondary school level is attributed to the instructional strategy adopted by the teacher to manage the class and effectively drive a topic home to the students. Supporting this view, Mcleskey & Waldron (2007) indicated that educational system need to accommodate both academic and social behaviours that can be channelled towards new ways of thinking, planning and teaching. This therefore calls for new pedagogical approaches in the classroom. In order to actively engage students in a class and tackles the challenges faced by students in acquiring basic computer skills, Peer-Mediated Learning (PML) was adopted in this research.

Peer-Mediated Learning (PML) also referred to as peer instruction or peer tutoring, is an instructional process/interactive strategy used in the teaching and learning process where students learn with or without the immediate intervention of a teacher (Boud, 1999).PML is an economical, flexible and supplementary instructional strategy that involves students serving as tutors and tutees. It basically can be conducted in a small or large groups where students with higher performance are paired with students with lower performance in other for them to get remedial help in reviewing critical or difficult subject areas in the classroom through one-on-one interaction (Hott& Walker, 2012; Nguyen, 2013).According to Chan(2009) PML is as an educational strategy where peers of targeted students interact together in other to acquire the necessary educational and social behaviour. This approach of learning perhaps might have effect on student's academic achievement as well as their skill acquisition in computer science.

An experimental study conducted on the effect of peer learning on students' academic achievement in Home Economics in Dunukofia, Local Government Area of Anambra by Okoye (2013), revealed that 95 students taught with peer learning obtained a mean score of 56.20 which was significantly higher than the students in the control group with a mean score of 40.27.Another experimental research conducted by Jibrin and Zayum (2012) on the effect of Peer Tutoring Instructional Method on the academic achievement in Biology among 105 secondary school students in Zaria Metropolis, showed that the mean achievement scores of students' taught using this method was 12.22 compare to students in the control group with a mean score of 6.58. The result showed that students who interacted with their peers performed better than the students exposed to traditional method of teaching.

Ezenwosu and Nworgu (2013) investigated the efficacy of peer learning on gender and academic achievement of 228 Senior Secondary school students. The result analysed in the pre-test and post-test experimental groups showed the male mean achievement scores of 35.95% (SD=1.02) and 61.76% (SD=9.90) respectively while that of the female showed 34.64% (SD=8.45) and 61.59% (SD=9.02) respectively. On the other hand, the mean achievement score of the pre-test and post-test male students in the control group was 35.00% (SD=7.80) and 52.61% (SD=9.70) respectively while that of the female showed 33.56% (SD=8.16) and 57.06 (SD=1.05) respectively. The result revealed that students taught Biology using Peer learning significantly performed better than the students taught using conventional method irrespective of gender. This implies that Peer learning was consistent across both gender. Also a study by Ushie, Akpan, Okworo and EMA (2014) on the use of Peer-Assisted Corporative Instructional Strategy and Cognitive ability levels of chemistry students showed the performance of female students to be higher than their male counterparts with a mean score of 13.68and standard deviation of 1.99 against the male students whose mean score was 13.60 and standard deviation of 2.91. However, the difference was not significant(t-value =0.15, df = 55, P-value >0.05). In order words, there was no significant difference in the achievement scores based on gender.

Statement of the Problem

Despite the predictions made by the National policy on computer 28 years ago to make the Nigerian society computer literate by introducing the subject Computer Science into primary and secondary schools, Ezekoka (2012) concluded that the agenda is yet to make a visible impact in the students' computer literacy skills.An investigation into students' competence in the use of computer applications revealed that Nigerian schools are mostly dominated with the chalkboard and textbook method of teaching and barely go to the computer laboratory for computer practical (Arenyeka, 2012). Another drawback can be attributed to teaching strategy predominantly applied by teachers which is the conventional lecture-based method (Uniprojects, 2015).

This consequently stands as a huge setback for students who would wish to gain admission or fit into computer related schools/course in the higher institutions of learning where the use of computer and the internet to compose notes, make presentations, conduct internet researches and communicate with their teachers via email is highly competitive (Oladunjoye & Benwari, 2014).Consequent upon these challenges, the need for Nigerian students to acquire basic computer skills cannot be over emphasised. This study therefore seek measures to enhance students' basic computer skills acquisition in senior secondary schools and to bridge the gap between students' cognitive knowledge of the computer and its actual usage by using Peer-mediated Learning.

Purpose of the Study

The purpose of the study is to examine the impact of Peer-Mediated Learning on Acquisition of Basic Computer Skills among Senior Secondary School Students' in Minna Metropolis.

Research Questions

1. Is there any difference in the basic computer skill acquisition of students taught using Peer-mediated Learning (PML) and those taught using conventional teaching method?
2. Is there any gender difference in the acquisition of basic computer skill of students taught using PML?

Research Hypotheses

HO_1: There is no significant difference in the basic computer skill acquisition of students taught using Peer-mediated Learning (PML) and those taught using conventional teaching method

HO_2: There is no significant gender difference in the acquisition of basic computer skill of students taught using PML.

Research Methodology

The research design adopted for this research was a pre-test, post-test, control group design. The population of this study was the entire Senior Secondary School Students (841) of 2016/2017 session in 31 Private Schools in Minna Metropolis, Niger State. Purposive sampling was used to select four (4) private secondary schools in Minna Metropolis. The sample of this study comprised of 80 Senior Secondary School Two Students (SSII).

The technique used for the selection of students was a simple random sampling. Students were first stratified based on gender, then ten (10) students were selected using the hat draw method in which 10 wrapped pieces of paper were written 'Yes' and others 'No' separately for male and female. Those that picked 'Yes' were selected while those that picked 'No' were dropped. This gave a sample size of 20 students (10 males and 10 females) from each of the secondary schools and a total sample size of 80 SSII students (40 males and 40 females).

Two instruments were designed by the researcher for data collection. The instruments include; Treatment Instrument and Test Instrument. The treatment instruments were the; Basic Computer Skill Instructional Power Point DVD Package and Class-wide Peer-mediated Drill and Practice (CWPMDP) while the test instrument was the Basic Computer Skill Acquisition Test (BCSAT). Basic Computer Skill Instructional Power Point DVD Package is a self-study instructional power point presentation that contained the instruction to be learned by students in the experimental group. A voice-over application software called Camstudio2.7 was used to capture the researcher's voice narrating the lesson on Basic Computer Skill in the power point presentation. The power point presentation captured using the Camstudio application was eventually burnt in a DVD. The classroom for the experimental group was flipped and the purpose of the instruction power point presentation on the DVD package was to allow the students have pre-existing knowledge on what they would learn interactively in the class as this formed the basis for their PML. On the other hand, Class-wide Peer-mediated Drill and Practice is an In-class game activity with a planned question and answer session that allowed the tutor and tutee in the experimental group to engage themselves in a cooperative learning activity in the classroom after they have used the Basic Computer Skill Instructional Power Point DVD to learn individually at home.

Basic Computer Skill Acquisition Test (BCSAT) contained questions drawn from related WASCE past questions papers on Computer Science. The test instrument had two sections, A and B. Section A which contained twenty (20) multiple choice items aimed at testing students' theoretical knowledge while section B which had five questions, each containing practical demonstrative steps aimed at testing students' psychomotor skills as well as their utilization of the computer in these basic computer skills (Word Processing, Internet and Email).To ensure the face and content validity of, it was validated by five experts in Computer Science and Educational Technology Department.The reliability of the instrument was also established through a pilot study. The result obtained was analysed using Kuda Richardson 20 ($K\text{-}R_{20}$). A reliability co-efficient of 0.78 was obtained which showed that the instrument was reliable.

A period ofeight (8) weeks was used for data collection. During the first and second (1st and 2nd) weeks of the study, pre-test BCSAT was administered to all the groups to determine the equivalence of both the experimental and control group before the treatment. From the third to sixth (3rd to 6th) weeks, actual teaching and learning commenced for all groups. While students in the control group learned in class using the conventional teaching method, students in the experimental group had their classroom flipped. On the seventh (7th) week, revision was done by the two groups and on the eighth (8th) week Basic Computer Skill Acquisition Test (BCSAT) was administered to the students.

Data Analysis and Results

The data collected were collated and analysed using t-test statistic. The result of the analysis provided answers to the two null hypotheses posed as presented in tables 1 and 2.

Hypothesis 1.

HO_1: There is no significant difference in the basic computer skill acquisition of students taught using Peer-Mediated Learning (PML) and those taught using conventional teaching method.

Table 1: Summary of t-test Analysis of Mean Achievement Scores of Students Taught using Peer-Mediated Learning and those taught using Conventional method.

Group	Variables	N	Df	X	SD	t-value	P-value
Pre-Test	Experimental	40		10.900	3.087		
	Control	40		9.750	3.232	1.713	0.095
			39				
Post-Test	Experimental	40		28.650	4.148		
	Control	40		21.300	3.082	8.617	0.001

NS: Not Significant at 0.05

Table 1 showed the t-test analysis of pre-test for experimental and control groups (t-value=1.713, df=39, P-value >0.05) was not significant. On the other hand,the t-test analysis of post-test for experimental and control groups(t-value = 8.617, df = 39, P-value <0.05) was significant, as such hypothesis one was rejected. The mean score of the experimental group for post-test was 28.650 and the standard deviation was 4.148 while the mean score of control for post-test was 21.300 and the standard deviation was 3.082, with a mean difference of 7.350. This implies that using Peer-Mediated Learning (PML) to teach Basic Computer Skills improved students' computer skills acquisition compared to conventional teaching method.

Hypothesis Two

There is no significant gender difference in the acquisition of basic computer skills of students taught using PML.

Table 2: Summary of t-Test Analysis of Mean Achievement Scores of Male and Female Students Taught Basic Computer Skills Using Peer-Mediated Learning.

Group	Variables	N	Df	X	SD	t-value	P-value
Post- Test	Male	20		21.15	3.183		
			38			-0.304	0.763
	Female	20		21.45	3.052		

Not Significant at 0.05

Table 2 showed the t-value was -0.304 and the P-value was 0.763, this means that it was not significant as such hypothesis two was retained. The mean score of the male group was 21.15 and the standard deviation was 3.183 while the mean score of female was 21.45 and the standard deviation was 3.052 with a minimal mean difference of 0.30 which was not significant. This implies that using Peer-Mediated Learning to teach students Basic Computer Skills have the same effect on students irrespective of gender.

Discussion

Findings of this study on the Impact of Peer-Mediated Learning (PML) shows that there was a significant impact on the post-test achievement scores of students taught Basic Computer Skills. Students taught using PML achieved significantly better than their counterpart who were taught using conventional method. This finding was supported by the study of Okoye (2013) where the result revealed that 95 students taught with Peer Tutoring Method obtained a mean score of 56.20 which was significantly higher than the students in the control group that obtained a mean score of 40.27. Also supporting this result is the research by Jibrin and Zayum (2012) on the effect of Peer Tutoring Instructional Method on the academic achievement on Biology which showed the mean achievement score of students' taught using Peer Tutoring Instructional Method to be 12.22 which was higher when compared to the mean score of students in the control group which was 6.58. The results therefore showed that students who were taught using PML achieved better than those exposed to conventional method of teaching.

The finding on the difference in the mean achievement score of male and female students taught Basic Computer Skills using PML showed that there was no significant difference in their mean achievement scores. In this study, PML was shown to be gender friendly. This finding is in agreement with the findings of Ezenwosu and Nworgu (2013) and Ushie, Akpan, Okworo and EMA (2014) who respectively found out that there was no statistical significant difference in the performance of students based on gender when taught using PML.

Conclusion

Result of statistical analyses of the post-test score of the experimental and control groups revealed that there was a significant difference in the mean achievement scores of the two groups with the experimental group taught Basic Computer Skills using Peer-Mediated Learning (PML) achieving higher than those taught with conventional teaching method. Similarly, there was no significant difference in the mean achievement scores of male and female students taught Basic Computer Skills using PML. It was therefore concluded that Peer-Mediated Learning (PML) in this study produced significantly better performance in students' Basic Computer Skill Acquisition irrespective of gender than students' taught using conventional method. Thus, PML is an effective teaching and learning strategy for students in secondary school and should be embraced by computer science teachers in Nigerian secondary schools.

Recommendations

1. Teachers should spend time in training the students on how to work in pairs and coach them in order for them to effectively achieve corrective feedbacks from PML sessions.
2. Plans should be made by school administrators on how to expose computer science teachers to training, workshops and seminars on the use of PML modes of instruction.
3. Stake holders in the educational sector should endeavour to make use of these findings and research ways to put into place educational policies that will improve computer literacy in Nigeria.

References

Ali, H. O. (2015). The use of Information and Communication Technology in technical and vocational education. *American Journal of Education Research*, 3, (7), 868-872

Arenyeka, L. (2012). Slow to boot: Nigerian students lag behind in computer education. Accessed from http://www.vanguardngr.com/2012/07/slow-to-boot-nigerian-students-lag-behind-in-computer-education/

Arugu, O.L. & Chilaka, F. C. (2016). Information and Communication Technology (ICT) Application in Social and Political system. *European Journal of Research in Social Science* 4(1)

Brent, R. (2005). Understanding students' differences. *Journal of Engineering Education*, 94 (1) 57-72

Boud, D. (1999) *Introduction; Making the move to peer learning. Peer learning for higher Education.* Kogan page limited, London, 1-20

Chan, E. K. (2009). Clicking with your audience. Evaluating the use of personal response systems in library. *CBE life Science Education,* 2, 4-24

Danner, R.B. (2013). A survey of ICT competence among students in teacher preparation programmes at the University of Benin of Benin City, Nigeria. *Journal of Information Technology Education Research*, 12.

Ezekoka, G. K. (2012). Peer tutoring strategies for Computer Literacy at Primary school level in Nigeria. Retrieved from http//www.reikojournala.org/index.phd/the-journal-of-social-and-ecomomic?id=159

Ezenwosu, S.U. &Nworgu, L.N. (2013). Efficacy of Peer Tutoring and Gender on students' achievement in Biology. *International Journal of Scientific and Engineering Research*, 4 (2). 944

Garrett, T. (2008). Student-centred and teacher centred classroom management. *Journal of Classroom Interaction*, 43 (1), 34-47.

Hott, B. & Walker, J., (2012). Peer Tutoring. Retrieved from http://www.council-for-learnigogechi1983-disabilities.org/publications/infosheets

Jegede, P.O. & Owolabi, J. A. (2003). Computer Education in Nigerian secondary schools: Gaps between policy and practice. Meridian; *A middle school computer technology online Journal,* 8(1)

Jibrin, A. G. & Zayum, S. D. (2012). Effects of peer tutoring instructional method on the academic achievement in Biology among secondary school students in Zaria metropolis, Nigeria. Science Education Programme. AbubakarTafawaBalewa University, Bauchi, Nigeria.

McLeskey, J. & Waldron, N.L. (2007). Making differences original in inclusive classrooms. *Intervention in school and clinic,* 42, 111-212

Nguyen, M. (2013). Students' reflection on peer scaffolding in making a collaborative oral presentation. *English Language teaching*, 6 (4), 64-73

Okoye, A. A (2013). Effect of peer tutoring method on students' academic achievement in Home Economics. *Academic Journal of interdisciplinary studies*, 2. (5). Published by MCSER-CEMAS-Sapienza, University of Rome

Oladunjoye, P. & Benwari, N. N. (2014). Computer literacy among undergraduate students in Nigeria Universities. *British Journal of education*. 2, (2), 1-8

Oluwatayo, J.A. (2012). Assessment of computer Literacy of secondary school teachers in Ekiti State, Nigeria. *Journal of International Education Resources*, 8(2): 1-8. Retrieved from http://www.journal.cluteonline.com/index.php/JIER/article/download/6904

Project Writers Nigeria, (2015). http://www.projectwriters.ng/new-national-curriculum-for-the-basic-science-and-technology-components/

Sherman, A. B. (2005). *Computer and Education: Towards agreement on Technology in Institution.* Heimlich F. John Wiley and sons

Uniprojects, (2015). Problems of teaching computer Science in secondary schools. Retrieved from http://www.uniprojectssrarch.com/problem-teaching-computer-science-in-secondary-schools/

Ushie, B.C., Akpan, S.J., Okworo, G.S. & EMA, P.E. (2014). Peer-Assisted Cooperative Instructional strategy and cognitive ability levels of Chemistry students in Etinan Local Government, Akwalbom, Nigeria. *International Journal Paper of Science and Technology Education Research,* 5 (1) 1-6