IMPACT OF COMPUTER AS A RESOURCE IN THE LEARNING PROCESS ON ACADEMIC PERFORMANCE OF STUDENTS IN THE SCHOOL OF EDUCATION, FCT COLLEGE OF EDUCATION, ZUBA-ABUJA

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Abstract
An integration of Information and Communication Technology (ICT) resources in teaching and learning processes has contributed to the attainment of educational objectives. The study investigated the impact of computer as a resource in the learning process on students' academic performance in the School of Education, FCT College of Education, Zuba-Abuja. A sample of 600 students from 4 departments participated in the study. A 13-item questionnaire was designed and validated through expert judgment and reliability co-efficient of 0.82 was obtained. Findings revealed that there was positive impact of computer as a resource in the learning process on students' academic performance. The null hypotheses were tested using Chi-square statistical analysis at 0.05 level of significance. Based on the findings, recommendations were made; seminar and workshops on computer as a resource in the learning should be organised to facilitate active and effective learning that would enhance attainment of educational objectives.

Introduction
Before the advent of technology in Nigeria, people used various media such as drums, flutes, gongs etc for communication and the classrooms' discussion was not left out. Objects such as stones and sticks were used to count numbers. The use of writing and invention of printing materials transformed the type and context of recorded history communication in a tremendous progression. Through the utilization of books, newspapers, magazines and radio; instructions were given to students at different levels of education. The advancement in technology has created so many ICT tools necessary and useful in education. In the last two decades, the higher institutions have invested heavily in Information and Communication Technologies (ICTs) by procuring facilities such as computers, installation of internet technology and projectors for teaching and learning processes. The significance of ICT cannot be overemphasized in education. ICTs have been generally accepted as modern instruments that enable the teachers to select the teaching methods that will increase students' (learners') interest in learning. ICTs consist of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information (voice, texts and images) electronically (Rockoff, 2004). The students' academic performance can be referred to as the competencies, skills acquired and attitudes learned through the education experience.

The direct link between ICT resource utilization and students' academic performance was in the heart of an extensive literature during the last two decades. Several studies have tried to explain the roles and the added values of those technologies in classrooms and on students' performances. Since the internet revolution, there is a shift in the literature that focuses more on the impact of online activities; use of internet; use of educative online platforms; digital devices such as phones, calculators etc in education. These new technologies are central to contemporary society and therefore referred to this era as information technology age. The education community is not left out in this trend as consequences of ICT resource utilization on academic performance of students have been felt greatly. Some of the studies revealed that the traditional methods of teaching and learning are more effective to academic performance than the use of ICTs. Astin (1999) and Coates & Humphreys (2004) findings compared the use of face-to-face method of teaching with online teaching and learning; after taking into account students' characteristics and selection bias; reported that the students in the online format scored 15% and 14.1% higher than students in

traditional methods. Attwell and Battle (1999) examined the relationship between having a home computer and school performance, for a sample of approximately 64,300 students in the United States. Their findings confirmed that students who have access to a computer at home for educational purpose demonstrated improved scores in reading and mathematics. Although, interest has been on how to use ICTs to support teaching methods in order to enhance motivation in learning, students' characteristics as well as teachers.

The research findings showed that the students use of ICTs, can positively impact their academic performance. Firstly, 83% of students use computers daily to facilitate learning. This is supported by Ramirez (2008) who pointed out that computers can be used as a supplement but cannot fully replace the teacher's job. Thus students use computers to download and save relevant information from the internet so as to facilitate learning. Secondly, 80% of students go on the internet mostly to send e-mails, and research/study, so as to get information from the internet which is not available in the school library, while 65% go to the internet to chat with family and friends.

Generally, applications of ICTs in teaching and learning activities offer the following effects:
  i.   Improve teachers' and students' quality of work
  ii. Develop communication and vocational skills
  iii. Improve poor handwriting and languages skills through word processing
  iv. Change teachers practices, planning tools and assessment rubrics
  v.   Increase opportunities for classes to evolve and for students experiences to shape outcomes
  vi. Enhance achievement/performance due to the reinforcement and practice that ICT afforded
  vii. Increase students' motivation towards learning
  viii. Encourage use of peer coaching and peer review (group discussion)

Factors that affect students' academic performances include teachers' characteristics, students' characteristics, educational environment, selection of teaching/instructional materials, utilization of instructional materials/resources, selection of suitable teaching methods, government policies on education, etc. Data from the research revealed that more than ¾ of students (83%) use computers to facilitate learning, although specifically male students (95%) use computers than female students (72%). This is supported by Martin (2005) who found that female students in the college get internet access less often, spend less time online and don't surf for different purposes as often as men. Furthermore, male students prefer to study courses that require computer use more than female students and show interest in programming. The male students are also more experienced at the computers' use than females, apart from e-mails where no significant differences were reported. Martin's findings showed that 85.8% of male students performed excellently in their field of study than female counterparts (27.3%) because of their exposure to the relevancies of computers in education.

According to Leuven (2004), there is no evident relationship between increased educational use of ICTs and students' performance. In fact, his findings showed a consistently negative and marginally significant relationship between ICTs' applications and some students' achievement. In Martin (2005) study revealed that on average, students who use ICT-based instruction scored higher than students without computers. The students also learnt more in less time.

Statement of the problem

Today, as the educational sector is faced with series of changes and reforms, it is good to reflect on matters concerned with the impact of computer and the students' academic performance. Numerous teaching strategies have been developed which correspond to the analysis of students' needs/challenges and provision of solutions to the educational problems through diverse learning methods. One of such strategy involves the use of information and communication technology (ICT) such as computer in the teaching and learning processes. The use of computer in teaching is a relevant and functional way of providing education to learners that will assist in imbibing in them the required capacity for the worth of work. Olobamise (2005) noted that the problem of information technology illiteracy was a serious one among teachers in the country as it cuts across the schools. He showed that many teachers in the country did not have basic computer skills and

noted that the problem was a hindrance to efforts at achieving the use of computers for educational purposes in schools. Computer facilitates information access towards solving educational problems encountered by the students. This study is therefore designed to investigate the impact of computer as a resource in the learning process on academic performance of NCE II students in the School of Education, FCT College of Education, Zuba-Abuja.

Research questions
The following questions were posed to guide the conduct of the study:
1.   What is the impact of computer as a resource on students' academic performance?
2.   Do students who use computer as a resource perform above average in school?
3.   Is there any significant difference in the performance of male and female students who use computer for learning processes?

Research Hypotheses
Two null hypotheses were postulated for the study:
1.   There is no significant relationship between application of computer as a resource in the learning process and students' academic performance.
2.   There is no significant difference in the performance of male and female students who utilize computer as a resource in the learning process.

Methodology
The study was a descriptive research design with emphasis on survey approach. This was adopted to enable the researchers gather relevant data on application of computer as a resource in the learning process and its impact on students' academic performance. The population of the respondents was made up NCE II students in the School of Education, FCT College of Education, Zuba-Abuja. The age of these respondents (students) range from 18 to 30 years with a mean age 24. With newly established department (ECCE), there are six (6) departments in the School of Education (Source: Examination and Record Unit of the College). A sample of four (4) departments was selected for the study. The selection was done through simple random sampling techniques on the basis of 150 students per department. Therefore, a total of six hundred (600) NCE II respondents constituted the sample. This is made up male and female students.

The instrument used for data collection was a questionnaire designed by the researchers and titled "Computer as a Resource in the Learning Process and Students' Academic Performance Questionnaire" (CRLPSAPQ). The questionnaire was designed to investigate the impact of ICT utilization on students' academic performance. The CRLPSAPQ consisted two (2) sections A and B. Section A was designed to elicit personal information on the respondents such as gender while Section B had 13 items to elicit responses on application of computer as a resource with respect to academic performance. The validation of the instrument was done through expert judgement to establish the face and construct validity and the necessary modifications were done. A re-test method was used to estimate the reliability co-efficient at three (3) weeks interval and it was found to be 0.82. This was considered reliable thus suitable for the study.

The instrument was scored on the basis of four-point scale of 3, 2, 1 and 0. Since the items were 13, the minimum score obtainable was 0. A mean range of 19.5 and above represented positive while a mean below 19.5 considered negative impact of computer as a resource in the learning process on students' academic performance.

The data collected were analysed using mean and standard deviations to analyse research question 1 while research question 2 was analysed using frequency count and percentages. The null hypotheses postulated for the study were tested using Chi-square statistical analysis at 0.05 level of significance.

Results
The results of data analysis on research questions and testing of hypotheses 1 and 2 are presented in tables 1 to 4. Out of the 600 questionnaires administered, only 562 (93.67%) were found suitable

for analysis. Other forms were either not returned/collected or not properly filled by the respondents.

Research question 1: What is the impact of computer as a resource on students' academic performance?

Table 1: Mean and standard deviations of impact of computer as a resource on students' academic performance

Mean range	N	$\bar{X}$	SD	Remark
19.51 - 39.0	417	23.21	0.42	positive
0 – 19.50	145	14.67	0.83	negative

Table 1 indicates that the impact of computer as a resource on academic performance had a mean of 23.21 and a standard deviation of 0.42. This means that computer as a resource in learning process affects students' academic performance positively.

Research question 2
Do students who use computer as a resource perform above average in school?

Table 2: Frequency count and percentage analysis of computer as a resource and students' academic performance

ICT	Academic Performance			
	N	High	Average	Low
ICT Usage	386	274(70.99%)	85(22.02%)	27(6.99%)
Non-ICT Usage	176	21(11.93%)	64(36.36%)	91(51.71%)
	562	295	149	118

The table 2 shows that majority of the students (respondents) (70.99%) who use comuputer as a resource in the learning process had high academic performance, only few 22.02% performed at average level while 6.99% of the students had their academic performance low with utilization of computer as a resource. The table 2 also indicates that 11.93% of the students who did not utilize computer as a resource had their academic perform high. Significantly, the table shows that students who utilize computer as a resource performed academically above average in the school.

Testing of hypothesis
The stated null hypotheses were subjected to test as follow at 0.05 level of significance.
H_{01}: There is no significant relationship between application of computer as a resource in the learning process and students' academic performance.

Table 3: Chi-square test between application of computer as a resource and students' academic performance

		Academic Performance					
	N	High	Average	Low	df	Cal. X^2	Critical X^2
ICT Usage	386	274	85	27			
					2	48.6	12.59
Non-ICT Usage	176	21	64	91			

P=0.05

Table 3 shows that the calculated X^2 value is greater than the critical value of 12.59. This means that there is a significant relationship between application of computer as a resource and students'

academic performance [$X^2 = 48.6 > P < 0.05$; df = 2]. Therefore, the null hypothesis is rejected and replaced with an alternate hypothesis.

Ho_2:   There is no significant difference in the performance of male and female students who utilize computer as a resource in the learning process.

Table 4:   Chi-square test between application of computer as a resource
                and students' academic performance on the basis of gender

Gender	N	Academic Performance			df	Cal. X^2	Critical X^2
		High	Average	Low			
Male	209	166	49	11			
					2	0.079	5.99
Female	177	108	36	16			

P=0.05

Table 4 shows that there is no significant difference [$X^2 = 0.079$; $P > 0.05$; df = 2] in the academic performance of male and female students who utilize computer as a resource. Therefore, the null hypothesis is accepted.

Discussion of results
Findings from analysed data on table 1 shows that application of computer as a resource in the learning process affects academic performance of NCE II students in the School of Education, FCT, College of Education, Zuba-Abuja positively. This result agreed with Attwell and Battle (1999) findings which showed positive impact of computer usage on students' performance.

Table 2 indicated that students who utilize computer as a resource in the learning process performed academically above average in the school and this result answered the research question 2. This finding is similar to Fuchs and Woessman (2004) which indicated positive impact of ICT on students' academic performance.

Table 3 and 4 were results obtained from the testing of the postulated hypotheses. The table 3 indicated that there is a significant relationship between application of computer as a resource in the learning process and students' academic performance. This is similar to the Ramirez (2008) findings which showed that students who use computers for achieving educational objectives scored higher than students without computers. Table 4 showed that there is no significant difference in the academic performance of male and female students who utilize computer as a resource in the learning process. This was an unexpected result to the researchers; it was assumed that the male students would be able to demonstrate higher academic performance than the female counterparts. The result is contrary to Martin (2005) report which indicated that male students performed significantly higher than females towards computer utilization on academic performance.

Conclusion
Following the results (N=417; $\bar{X}$=23.21 & SD=0.42) obtained in the table 1, the relationship between the uses of computer as a resource in the learning process and students' academic performance is very significant. The utilization of computers in the learning process had motivated students to commit to learning and participate actively in the teaching and learning activities. The findings of the study revealed positive impact of computer as a resource in the learning process on students' academic performance.

Recommendations
Based on the findings of this study, the following recommendations were made:
i.   Adequate funds should be provided towards procurement of ICT resources such as computers, relevant textbooks to enhance students' active participation in learning processes.
ii.   Parents/guardians should provide home computer for their children to promote educational self-learning and assessment.

iii. Seminars and workshops on handling/utilization of computer as a resource should be organised for teachers towards effective teaching and learning activities.

iv. Educational environments such as e-library and classroom should be provided and conducive to promote qualitative learning.

v. Internet technology should be made affordable for students to widen their scope of knowledge through access to real world information on web that will enhance their academic performance.

vi. School management should engage their students in computer practical as it will help the students to get use to computer for achieving higher academic performance.

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APPENDIX

COMPUTER AS A RESOURCE IN THE LEARNING PROCESS AND STUDENTS' ACADEMIC PERFORMANCE QUESTIONNAIRE (CRLPSAPQ)

Dear Respondent,
This questionnaire aims at finding information from you basically for research purpose. It investigates the impact of computer as a resource in the learning process on students' academic performance.

Section A: Personal Data
Name of Department:_____
Gender: Male [   ]   Female [   ]

Do you use computer for learning: Yes [   ]   No [   ]
The statements below reveal the researchers' views on computer as a resource and students' academic performance. Kindly indicate your level of agreement or otherwise with each statement by marking a tick (√) in the column against each statement.

Note: SA means Strongly Agree
       A   "   Agree
       D   "   Disagree
       SD   "   Strongly Disagree

Section B: Computer as a Resource and Students' Academic   Performance

S/N	Items	SA	A	D	SD
1.	Computer as a resource fascinates students and makes learning interesting.				
2.	Computer as a resource in the learning process often results in a deeper focus and concentration.				
3.	Computer as a resource enhances students' rate of assimilation.				
5.	Computer as a resource develops effective communication technique.				
6.	Computer as a resource enhances students' computational skills and logical reasoning.				
7.	Computer as a resource allows students to learn independently.				
8.	Computer as a resource improves students' quality of work				
9.	Computer as a resource in the learning gives students more control in the classroom.				
10.	Computer as a resource increases retention of information.				
11.	Computer encourages use of peer coaching and reviews of lessons.				
12.	Computer as a resource in the learning encourages academic laziness.				
13.	Computer as a resource enhances students' participation in the learning process actively.				