# NIGERIA JOURNAL OF COMPUTER LITERACY (NJCL)

VOLUME 8, NO 1, 2007

**OLAGUNJU, A.M.** ***(Ph.D. )***
***Editor***

# NIGERIA JOURNAL OF COMPUTER LITERACY
# VOLUME 8, NUMBER 1,2007

**Nigeria Journal of Computer Literacy**

**First published June, 1996**

**ISSN: 1118-0056**



Published by the Department of Teacher Education
Faculty of Education, University of Ibadan

Printed by University of Ibadan Printing Press.

# NIGERIA JOURNAL OF COMPUTER LITERACY

## EDITORIAL BOARD

# PREFACE

The Nigeria Journal of Computer Literacy (NJCL) publishes well-researched theoretical and empirical studies in Science, Technology and Mathematics Education as well as other disciplines especially those related to computer knowledge, attitude, skills and applications.

In this edition, readers are provided with articles covering a wide range of issues on applications of ICT to the educational system, perception of teachers on barriers to successful implementation of ICT in secondary school science teaching and learning, students' level of competence in ICT as well as higher education teaching effectiveness in an ICT driven classroom.

The edition is also rich in information on the various uses of internet facilities among secondary school students, effectiveness of computer assisted instruction on mathematics learning outcomes and other issues concerning availability of ICT facilities, teachers' computer literacy and attitudes as well as the extent to which these influence utilization of computer facilities in teaching.

Some striking features of this edition include the special attention focused on the girl-child's education through ICT means, instructional delivery modes for improved performance of distance learners and transition to mobile Government.

Above all, these articles were outcomes of not only individual efforts but also collaborative research endeavours of seasoned scholars across Nigeria. Readers, therefore, have this unique opportunity of benefiting from the reports towards improved ICT knowledge, skills and its integration in teaching, learning and societal development. Indeed, students, teachers, school administrators, curriculum developers, policy makers and government at all levels would find this edition useful toward improved effectiveness, efficiency and productivity in their respective tasks.

**Dr. Alice M. Olagunju**

# NIGERIA JOURNAL OF COMPUTER LITERACY (NJCL)

**Note to Contributors:**

1. The Editorial Board of the journal is prepared to consider for publications:
   (i) ' reports of empirical/field studies concerned with expanding knowledge of the teaching and learning process in computer literacy.
   (ii) Technical, methodological reports involving computer-based education.
   (iii) Theoretical and philosophical papers in education and computers.
   (iv) Review of technical scientific and interactive research.
2. Manuscript should not be more than 15 papers of quarto or A4size sheets: double-spaced typing. Each manuscripts should be preceded by an abstract of not more than 100 words.
3. Authors name, address and a short biography note should accompany each manuscript on a separate page.
4. Footnotes are not acceptable. References appearing in the text
   should be cited using the author/data system.
5. All tables, diagrams, illustrations etc. must be on separate sheets, clearly labeled: material that contains numbers should be referred to as TABLES, materials containing diagram or artwork should be referred to as FIGURES. Each table and figure should bhave an explanatory legend, which should be typed at the bottom of the page.
6. All illustrated tables, figures, charts, graphs, diagrams and

photographs must be of high quality to permit immediate reproduction.

7. Briefly, we adopt the style of the latest edition of the publication manual of the American Psychological Association (APA). Consult it for a guide.

8. Manuscript (s) can also be submitted in diskettes following the guidelines.

(i) Use 3.5 diskette in IBM/MS-DOS windows or Microsoft word

(ii) Electronic illustrations (if desired) on a separate diskette from the text

(iii) Label diskette with your name, the file name, and word processing programme used.

9. Manuscripts are accepted for review with the understanding that the same work has not been published or submitted for publication elsewhere.

10. Manuscript which are NOT prepared in line with these notes will immediately be returned to the author(s) for necessary compliance.

Finally, manuscript must be in English and 3 copies should be submitted to:

The Editor,
Nigeria Journal of Computer Literacy,
Department of Teacher Education,
University of Ibadan,
Ibadan, Nigeria.

Please note that the above Notes are subject to change, intending contributors are therefore advised to consult most recent edition of the journal.

# EDITORIAL POLICY

Nigeria Journal of Computer Literacy (NJCL) publishes theoretical and empirical research articles in science, technology, mathematics and other disciplines in relation to computer knowledge, attitude, skills, and applications.

. It is accessible to researchers from any part of the world who have interest in having their papers published in it. It is published twice in a year – June and December.

Those wishing to submit papers for inclusion in any volume of the journal are expected to note the following guidelines carefully and allow them to guide the style and format of their papers.

1. Papers must be original and may not have been previously submitted to any journal for publication.
2. Papers must not be more than 12 pages long, typed double spacing on one side of A4 paper.
3. Contributors are required to make sure that they conform with current APA format and present their papers in MSW. Such papers must carry the names and full addresses as well as the e-mail addresses of the contributors.
4. Three copies of the paper must be sent to the Editor with a 041,000.00 assessment fee.
5. Contributors of successful papers will be contacted for the payment of the current publication fee which changes from time to time to reflect current economic realities.

Copies of the journal can be requested for from the Editor-in- Chief or the Editor, Department of Teacher Education, University of Ibadan, Ibadan, Nigeria, amolagunju@yahoo.cpm

Subscription rates are as follows

| | |
|---|---|
| Individual | N6,000.00 |
| Institutional | N6,000.00 |
| Price per copy | N600.00 |

# CONTENTS

# Junior Secondary School Students' Competency in ICT: An Assessment of Effectiveness of SNNG Project in Southwest, Nigeria

**S. A. Amoo and J. G. Adewale, Ph.D**
*International Centre for Educational Evaluation,*
*Institute of Education, University of Ibadan,*
*Ibadan – Nigeria*

amooadesina@yahoo.co.uk and gbengaadewale@yaho.co.uk



## Abstract

*Identifying effective and ineffective schools is a dominant issue in education in light of the increasing concern for students' achievement, performance and accountability. Educators involved in school improvement projects face the dilemma of choosing from a variety of methods for measuring school effectiveness. One of such methods to improve learning and teaching in Nigeria is not to undermine the impact of ICT in Junior Secondary Schools as well as their ability to show level of competence in ICT. This study therefore examined the Junior secondary school students' competence in ICT aspect of computer education. Purposive sampling technique was used to select the schools involved in the study. The sample consisted of 562 (51.1 %) males and 538 (48.9 %) females. The students were between 12 and 17 years old. Students' Competence in ICT Test was used to measure their ability in computer education. Data were analysed using descriptive statistics and multiple regression. The results showed that 31.1% scored above average, while 68.9% scored below the average. There was a significant composite effect of access, utilisation and quality of ICT*

*facilities on competence ($F_{(8, 1091)} = 7.74$, $p<0.05$).the most predictors of students' competence in ICT were access to computer, quality of internet and hours students spent on Internet to do homework. It is recommended that there is need to increase students' access, utilisation and quality of ICT facilities because of improved students' competence in ICT usage. Therefore, there is need to maintain the qualities of ICT facilities in the existing schools and extend its provision to other schools so as to enhance school effectiveness. More time should be given to develop skills in computer education so as to master necessary competence in ICT.*

**Keywords**: Competency in ICT, School effectiveness, Junior secondary school students, Southwest, Nigeria

## Introduction

A wealth of research has established that improving access to Information and Communication Technology (ICT), education generally including school effectiveness in handling human and inhuman resources is crucial for national development. The integration of ICT into basic education especially when students at this level are exposed to dynamics and revolutions will further facilitate or improve school effectiveness and in the long run enhance national development. For example, advances in ICT research reports have helped to position the impact of ICT among physical sciences. Its significant impact on learning and teaching has equally been widely acknowledged (Aremu, 2002; Ekoko, 2002; Sotayo, 2002; Asim, Kalu & Ani 2003; Ekweme 2003; Olagunju, 2003; Bamikole, 2004 and Adeyemo, 2005). These acknowledgements range from what use to be mere Information Technology appreciation to access, utilisation and quality in the ICT education.

ICT centred education in the classroom equally involves the use of computers online, self-learning packages, chips, satellites radio and optical fibre technologies (Akudolu, 2002). If ICT centred education is understood, then competency in the ICT involves ability to handle ICT facilities, perform task on the facilities with aim of achieving educational goals. Its integration into the school system will enhance the school effectiveness in the areas of teaching and learning thereby improving the quality of instructions, thereby achieving educational goals. Generally, ICT represents all computer and computer mediated tools, electronic devices, all its accessories capable of motivating the teachers and learners to achieve the essence of digital divide with the use of online or internet facilities. In the schools where these facilities exist, there is likelihood that students' access, utilisation and their quality will go a long way to bring about measurable competence in ICT use. Realising the importance of ICT in the school system made the (FRN, 2004) to emphasize the provision of necessary infrastructure and training for its integration. In Nigeria's bid to achieve this, the major aim is to establish the type of education system that can produce citizens who can contribute effectively to life in the society. Hence, there is justification for ICT integration in the junior school computer curriculum system as well as one of the bases to further achieve quality in school effectiveness.

On the other hand Adewale (2006) states that one of the measures of school effectiveness that has stood the test of time is student's achievement. There seems to be a relationship between school effectiveness and school quality. The studies of Farombi, (1998); Onwuakpa, (1998) and Fabayo (1999) deal with school quality. While school quality is looking at the level of material inputs allocated to schools on a per pupil level and the level of efficiency with which fixed amounts of material inputs are organized and managed to raise students' achievement (Fuller, 1986). School effectiveness is interested in such variables as: instructional leadership provided by the school head, curriculum - learning

objectives, learning activities, and achievement measures (Adewale 2004). Others are monitoring of pupils / pupils attendance, discipline and school climate, expectations for quality work supported by staff and pupils, existence of school / community partnership programmes. However, the indicator of school effectiveness that is so obvious to the society is the *product of schooling*, (that is, the achievement level of the students in examinations). If a school produces students with high grades, the school is often tagged effective while a school that cannot turn out students with high grade may be regarded as an ineffective one.

It appears that definition of school effectiveness is a complex task, one which should be expressed in terms of qualitative variables (school climate, instructional leadership, high expectations, etc.) as well as quantitative variables (achievement scores). The different methods used to measure school effectiveness can be analyzed along four basic dimensions: (1) level of aggregation; (2) criteria of effectiveness; (3) time frame of analysis; and (4) population. The patterns that have emerged in studying schools as complex social systems reveal a set of distinct characteristics in high-achieving schools. These factors include: (1) strong administrative leadership, particularly in the area of curriculum and instruction; (2) an orderly, safe environment conducive to learning; (3) a pervasive and broadly understood instructional focus emphasising a commitment to basic skills; (4) teacher behaviours that convey the expectation that all students must obtain at least minimum mastery; and must obtain at least minimum mastery; and pupil achievement as the basis of program evaluation. If our children are to achieve levels of productivity, citizenship, and personal comfort that exceed our own, they will have to be better educated. Much of that improved education must be provided in schools through a teacher's guidance. Therefore, our schools must become more effective to be able to carry out these functions (Owen 2004).

In an attempt to understand the impact of ICT integration as promoting school effectiveness, researchers' aim is to ascertain whether integration of resources, processes and organizational arrangements affect student outcomes, and if so in what way. Most educators would agree with Leithwood, Jantz and Steinbach (1999) when they concluded that conceptualizing effectiveness in terms of standardized achievement test scores was too narrow because it ignored all the effects of schooling, and the wider range of cognitive and affective variables that were essential outcomes of school effectiveness but could not be reflected by a test score. It is argued in another way that while the above observation is true, the reality of the politics of schooling demands a tangible measure that can be looked at comparatively and until more measures are ascribed to other desirable outcomes of schooling, and assessment of the psychometric properties of those outcomes are in place, students' achievement and competences would remain the yardstick by which schools are judged effective.

In almost all facets of life, ICT has become so dependable tool to carry out human activities such as banking, engineering, teaching, medicine, military, navigating, offices, and supermarkets and so on. Since computer is versatile, there is an increasing awareness of Information and communication technologies (ICTS) in Nigeria especially in schools. In order to support the use of computer, Nigeria has some initiatives such as the National Policy on Computer Education, National Policy on Information Technology (2000) and establishment of National Information Technology Development Agency (NITDA).

However, ICT in schools {primary and secondary} is not yet well developed in Nigeria (Adewale, Adesoji and Iroegbu, 2003). No example is known of a classroom in secondary schools where a teacher routinely uses the computer as a teaching aid (Adewale, 2005). Nigeria has a well-developed telephone system (with the introduction of Global System of Mobile communication (GSM))

which gives a good Internet access from most parts of the world. Internet charges are lower than the local call voice. Although, there are some problems associated with the connectivity of internet in Nigeria, one of them is power generation. This problem could be solved by students through the use of cyber-café where generating plant are often used (Adewale, 2005). As the Internet becomes a common feature in Nigeria, teachers and researchers have begun to search for ways to take advantage of its potential for students' learning. For Nigeria to develop technologically, students' competency in ICT is important.

A perusal of national policy on Nigeria states that one of the most important goals of the educational process is that children should be able to acquire some basic competences and skills in promoting permanent literacy, self-sufficiency, and some requisite attitudes necessary to function effectively in the context of the nation's socio-economic and psychological setting (FRN 2004). One of such is the competency in ICT in junior secondary schools in Nigeria. Also, In Nigeria and all over the world, educational experience and training in diverse knowledge and skills prepare one to face challenges in life. Individuals then become empowered to modify their environment to meet their needs and desires which is in line with policy on education. In order to achieve educational goals, improving the quality of education is a critical issue, particularly at a time of our educational expansion, reforms, quality and effectiveness in our education, competence in ICT should be paramount. One of the ways to achieving quality and school effectiveness in our education is not to undermine the impact ICT in our school system as stated in the policy (FRN, 2004). ICT enhances the quality of education in several ways: increasing learner motivation and engagement, facilitating the acquisition of basic skills, and enhancing teacher training.

The extent to which schooling is able to promote these knowledge and skills, i.e. the level of learning achievement, is reflected in the quality of learning outcome. Learning achievement is described as how much pupils at a specified level of schooling have acquired in the knowledge and skills defined for that level within the curriculum (Falayajo et al. 1997). Learning achievement in any subject can be measured by the achievement test in that subject (Obemeata 2000). Achievement tests in a particular subject, according to Obemeata (2000) and Ayodele, Adegbile, and Adewale (2001), are a series of questions given (using a criterion-referenced test- the curriculum) to learners in order to determine their mastery level in the subject.

Therefore, the achievement test in life skills is used to measure learners' competences in life skills. Competence according to Atherton (2003) is the ability to perform the requisite range of skills for practice. As represented here, it has a broad base. In all areas of practice there will be some skills in which experts are 'merely competent': for example, in some instances, many nurses are far more competent than doctors in taking blood samples. There are inconsistencies in the way competence is measured. It appears to these investigators that it all depends on competences in what' we are interested in.

Different methods are used by different authors to measure competency; for example, Chun (2005) identified four levels (non-user, basic, intermediate, and advanced) of competencies in computer skills (using Microsoft WordTM). Chun went further to indicate that non-user describes someone who does not use a computer at all. For a person with basic skills, it is sufficient to perform daily word processing tasks, such as, producing routine letters, memorandums, and informal reports. A person with this level of skill is able to use basic formatting, editing, printing functions, and understands the document page setup. For intermediate level, it

is necessary for the person to use and create a variety of templates, complex tables, merges, manage table data, and sort. A person with this level of skill is able to customise toolbars, import and insert graphs, embed ExcelTM data, create elaborate reports, and create a web page based on a template and add hyperlinks. For advanced level, it is required for the person to produce very large, complex formal documents that require a table of contents, footnotes, endnotes, bookmarks, and other special elements. A person with this level of skill is able to use and create a wide range of graphic effects and has full mastery of macro commands.

Dreyfus and Dreyfus (1989) measured competency along five points: novice, advanced beginner, competent, proficient, and expert. They see a novice as a rigid adherent to taught rules or plans with little situational perception and no discretionary judgment. They observe that advanced beginners need guidelines for actions based on attributes. Advanced beginners see actions in terms of longer-term goals, conscious deliberate planning, and standardised and routinised procedures.

Dreyfus and Dreyfus (1989) postulate that proficient sees situations holistically rather than in terms of individual aspects; sees what is most important in a situation; perceives deviations from the normal pattern; has less laboured decision-making; and uses maxims for guidance, whose meaning varies according to the situation. They conclude that an expert does not rely on rules or guidelines; (s)he grasps situations intuitively based on deep tacit understanding. (S)he uses analytic approaches only in novel situations or when problems occur.

The Department of Education in South Africa (1998) in its competency framework identifies and defines the competencies needed for professional and business classes. The professional and business competencies needed are communication, personal management, interpersonal, leadership, organisational, management,

and stakeholder skills. It went further to hierarchically define competencies in three levels: basic, intermediate, and accomplished. A basic level of competency requires the incumbent to know general terms, concepts, processes, and objectives of the competency and be able to apply the competency to common tasks. An intermediate level of competency requires the incumbent to be able to apply the competency consistently to perform common tasks. An accomplished level of competency requires the incumbent to be able to use the competency consistently to perform complex tasks requiring creativity and judgement. Generally, competence of a learner is determined in terms of knowledge, skills and values in a specialised context (Department of Education in South Africa, 1998).

This can be achieved using authentic assessment strategies. Fraser (1999) describes authentic assessment tasks that resemble skills, activities and functions in the real world and in school. Assessment then becomes a learning experience in which learners are prepared to apply their knowledge, skills, and values in an integrated manner. Assessment of knowledge, values, and skills relates to assessing elements in the cognitive, affective, and psychomotor learning domains. The taxonomies of Bloom (cognitive domain), Krathwohl (affective domain), and Harrow (psychomotor domain) remain invaluable frameworks for assessing acquired knowledge, skills, and values (Van der Horst and McDonald 1997).

Competence has to do with manipulating or displaying some skills in the use of computer and other ICT facilities. In literature, Smith (2004) relates that students who have been exposed to certain skills as a result of instruction had demonstrated increased self-efficacy. In the same study, Smith shows that students indicate and claim a high degree of computer technology expertise and increased self-efficacy (confidence) rather than actual performance (competence). Smith (2004) equally reports significant difference existing between the post-course self efficacy and performance. In

the similar study, Roth & Karsten (1998) find that students demonstrate ability to use computer in future significantly improve as a result of their training experience. In a nutshell, the ability of students' performance in the ICT skills acquired will probably be as a result of access the students had to the facilities, the countless time of utilisation and at the same time the quality in the facilities as to produce learning outcomes.

The rationale for this study was to find out whether access, utilisation and quality of ICT facilities have something to do with developing skill acquisitions among the students who have been exposed to some training. If so, what is the level of these students' competence if asked to perform the specific activities within specific time frame? In this study the test administered measure competence in the students being able to interact with computer. The activities included: typing, inserting text on objects, saving documents, retrieving document opening web page, use of keyboard command keys, and opening of e-mail and how to attach mail.

This study is therefore, necessary since it will provide relevant information on the contribution of some factors such as presence of infrastructure, resources; and connectivity as prerequisite to the functionality of ICT facilities in predicting students' learning outcomes in ICT as well as enhancing the effectiveness of SchoolNet Nigeria (SNNG) project in secondary schools. This study reports the students' performance in ICT skill acquisition test as result of their interactions with SNNG-ICT facilities. Towards this trend, the following research questions were included.

**Research Questions**

**Research Question 1:** To what extent do the students competent in the use of ICT facilities?

**Research Question 2:** What are the composite and relative contributions of access, utilisation and quality of students' competence in ICT facilities?

## Methods

The study was conducted as a sample survey covering four States having SchoolNet-ICT facilities in Southwest, Nigeria. The population considered in this study is made up of students from SchoolNet project schools in Nigeria. These students were preparing for the final examinations obligatory to satisfy the minimum Basic education at JSS (pre-vocational schools) in 2006/2007 school year. The process involved in the selection was based on stratified sampling of the country into six geo-political zones. There were 140 functional centres in which southwest had 22 centres. A total of 20 centres (SchoolNet project schools) that satisfied the Basic education set up were included in the study. Third year students from each schools were randomly selected. Junior Secondary School 3 Students who have Computer and Internet Connectivity in Southwest, Nigeria were involved and these constituted the population of the study. A non probability random sampling techniques was adapted to select 1100 JSS students from each of the schools. The survey involved the administration of the competence test instruments in ICT. The competency test in ICT items computer curriculum referenced. Using the curricular requirements for JSS 3 in Computer Education, 12 items were used for the study.

The competency test underwent appropriate validation processes. The experts on the field of computer and computer education, the researchers' colleagues and experts in measurement and evaluation attested to the appropriateness of the final items included in the test. The reliability of the test was determined using a method of test re-test was 0.70, the researchers considered this good enough to use for larger audience.

## Procedure

The researchers personally administered the test on the students with the assistance of their Computer teachers who serve as research assistants coordinated the collation and return of the tests. The researchers and their assistants instructed, then observed and scored

the students' activities as the students perform the skills to be measured on the computer. The students saved works were later used to complete the final score awarded at the end of the exercise. The retrieved instruments were coded for computer analysis.

## Results and Discussion

The results of the study are presented in the tables below

**Research Question 1**: To what extent do the students competent in the use of ICT facilities? In order to answer question one, the researcher considers the scores from skills the students had when dealing with ICT concepts. Table 1 show the mean, SD, minimum and maximum scores, the skewness and kurtosis for the answer.

**Table 1 Results of Students' Competence in ICT in South West Nigeria**

| State/ Competence | N | Mean | Std Dev | Minimum | Maximum | Skewness | Kurtosis | % |
|---|---|---|---|---|---|---|---|---|
| Ekiti | 440 | 24.15 | 2.775 | 10 | 33 | 0.077 | 1.995 | 60.37 |
| Lagos | 165 | 24.93 | 3.077 | 18 | 36 | 0.686 | 0.750 | 62.33 |
| Ogun | 220 | 25.16 | 2.634 | 20 | 32 | 0.685 | 0.091 | 62.90 |
| Ondo | 275 | 24.20 | 2.515 | 18 | 32 | 0.354 | 0.933 | 60.50 |
| Total | 1100 | 24.48 | 2.763 | 10 | 36 | 0.310 | 1.372 | 61.20 |

Table 1 gives the summary of the scores (Means, Standard deviations, Skewness and Kurtosis) of the subjects on the ICT Skill acquisition test with only one State and that is Lagos (62.33%) and Ogun (62.90%) scoring above the average while Ekiti (60.37 %), and Ondo States (60.50 %) scored below the average. The possible

reason for Lagos and Ogun outshining other states might be due to the nature of urban characteristics in which most of students are exposed to and instructional practices their teachers did. In all, 55% of the schools clustered around the average score with 1 % of it a bit lower. 45% of the schools performed below average in the skill acquisition. The reasons for this result might be connected with other inherent factors off teaching and other classroom interactions like motivation and accommodation of students use towards the subject. In order to see the distributions of the performances in ICT competence test, the researcher uses skewness and kurtosis to determine degree of peakedness of the distribution of the scores and the degree of departure from symmetry of the distribution respectively. From graph 1, the smoothed frequency polygon has longer tail to the left of central maximum than to the right, the distribution is negatively skewed. Using relative standing, the researcher showed that 31.1% scored above average, while 68.9% scored below the average. The reasons for this result might be connected with how often these students were exposed to the skills, the time they set aside to practice the skills, the location of the schools and exposure to similar ICT facilities at home or other public places could be contributory to their performances.

The researchers only make inference from this study to conclude the learning outcome, because they are unaware of the kind of study presented in this chronological order. However, the results of students in skill acquisition test as a measure of competence is in line with the reports of (Rafi, 1998, Colley & Comber, 2003) who recorded that the use of computer in education has influence on students' performance in computer usage.

**Research Question 2:** What are the composite and relative contributions of access, utilisation and quality of students' competence in ICT facilities? To answer the research question two, the researcher uses the results of various skills the students displayed during field work. The scores were coded to measure their

competence or how they had mastered some skills. Tables 2 and 3 present the results of the findings.

**Table, 2: Composite contributions of Access, Utilisation and Quality of SNNG facilities to competence in ICT**

| Variable | MR (Predictor) | R square | Adjusted R square | F value | Sig. | Decision |
|---|---|---|---|---|---|---|
| Combined | 0.232 | 0.054 | 0.047 | 7.740 | 0.000 | S |

Table 2 presents the composite variables contributions to students' competence towards ICT. The Summary of Regression Analysis (SRA) MR = 0.232, R Square = 0.054 Adjusted R = 0.047 and ANOVA. $F_{(8, 1091)} = 7.740$, though significant at $P<0.05$ because it was calculated at P=0.000. R square for this regression equation is 0.054, which means that about 5.4% of the variation in ICT competence scores of students is explained by regression model. This suggests that 94.6% of the variation in ICT skill means scores can be explained by factors other than the independent predictor-variables in regression model. The adjusted R square for this regression equation is 0.047, which means that about 4.7% of the variation in ICT scores of students is explained by regression model. This suggests that 95.3% of the variation in ICT means scores can be explained by factors other than the independent predictor-variables in regression model. However, table 3 shows the contributions of each of what constituted the access, utilisation and quality to predict the competence in ICT use. The regression coefficient (ranged from -0.168 to 0.163) Standard error ranged from 0.124 to 0.587 and t-value (ranged from -4.171 to 3.511. The table shows the t-values associated with access to computer, Internet, quality of Internet, quality of computer, number of time students search for information on Internet facilities in a week with teacher are statistically significant while others are not at $P \leq 0.05$, but others at $P>0.05$. The summary of the beta values of the regression of Skill acquisition or

competence to ICT use on all the variables considered for this study. The beta values enable the researcher to generate the required regression equation showing linear relationship between dependent and independent variables. The relative contributions enables the researcher to generate a regression equation of the form below and where $Y_1$ – Competence in ICT use; A is constant; $X_1$ access to computer; $X_2$ access to internet; $X_3$ numbers of time students do computer a week with teacher; $X_4$ number of time students search for information on Internet facilities in a week with teacher; $X_5$ number of hours students spend on computer for typing to do home work in a week; $X_6$ number of hours students spend on Internet to do homework; $X_7$ quality of computer, $X_8$ quality of internet; and, e to competence to SNNG facilities' ICT use. The possible outcome of the results might be due to location, the nature of the schools and the time the studies were carried out. The directions of individual contribution of the variables are presented on table 3

**Table 3: Test of significance of the Regression Coefficient in Competence in ICT use**

| Competence Variables | Un-standardized coefficients | | Standardized Coefficients | | Sig. | |
|---|---|---|---|---|---|---|
| | B | Standard Error | Beta | T | | |
| Constant | 22.941 | 0.587 | | 39.053 | 0.000 | |
| Access to computer | 0.746 | 0.213 | 0.200 | 3.511 | 0.000 | 1st |
| Access to internet | -0.516 | 0.124 | -0.168 | -4.171 | 0.000 | 2nd |
| Time students spent to do computer in a week with teacher | 0.000 | 0.413 | 0.000 | -0.001 | 0.999 | 8th |
| Number of time students search for information on Internet facilities in a week with teacher | 0.111 | 0.453 | 0.026 | 0.246 | 0.806 | 7th |
| Hours spent on computer to do homework | -0.439 | 0.417 | -0.091 | -1.053 | 0.293 | 6th |

| | | | | | | |
|---|---|---|---|---|---|---|
| Hours students spent on Internet to do homework | 0.581 | 0.201 | 0.147 | 2.889 | 0.004 | 5th |
| Quality (Computer) | -0.558 | 0.190 | -0.164 | -2.943 | 0.003 | 3rd |
| Quality (Internet) | 0.723 | 0.216 | 0.163 | 3.346 | 0.001 | 4th |

The findings from table 3 led to the regression equation for the skill acquisition in ICT using SNNG facilities:

$Y = 22.941 + 0.746X_1 - 0.516X_2 - 0.558X_3 + 0.723X_4 + 0.581X_5 - 0.439X_6 + 0.111X_7 + e.$

However, the regression further means that SchoolNet intervention school students would have an average competence score of 22.941 in ICT if all predictor-variables are zero. The predictor-variables that could improve skills in ICT significantly are (i) access to computer; (ii) number of time students search for information on Internet facilities in a week with teacher; (iii) number hours spent on internet to do homework and (iv) the quality of Internet. Another strategy that may improve the skill acquisition in ICT is to discontinue with bad access of internet; unnecessary hours students spend on computer to do homework; computer with bad quality; and numbers of times students do computer a week with teacher.

The summary of the regression analysis of what constitutes access, utilisation and quality to students' competence in ICT use is given in form of equation above. In a nutshell, this outcome is as a result of access to, utilisation and quality in SNNG facilities, more importantly, access to and quality of these facilities showed prominence in skill acquisition of the students. This is in line with competence in the use of computer to perform tasks. Jegede (2006) report on computer skills, though the focus was on teachers. When

this work is compared with (Karsten & Roth, 1998, Karchmer, 2001 and Mumtaz & Hammond, 2002) seemed to be in congruence.

**Implication of the findings**

The study has implications for the students in JSS in the following areas the study covered:

In order to improve students' skills in ICT significantly, there is need to (i) enhance students' access to computer in order to increase the students' competence in ICT; (ii) increase number of time students search for information on Internet facilities in a week with teacher so as to monitor their competence; (iii) extend number of hours spent on internet to do homework so as to gain more access to quality educational materials and (iv) improve on the quality of Internet service so as to enhance what students do with ICT.

**Recommendations and Conclusion**

Based on the findings in this study, it is recommended that government should set aside fund to repair the ailing infrastructures in the schools. These should include the building of laboratory and making the internet facilities in the schools more functional and as well improve on the power generation supply. Another strategy that may improve the students' skill acquisition in ICT is to discontinue with access to bad internet service; to spend unnecessary hours on bad or spoilt computer to do homework

There should be monitoring team set aside to visit the schools from time to time on the general supervision of the ICT facilities this will serve as measure of effectiveness in the ICT facilities. Ministry of Education of the various States should help upgrade the old computers and possibly employ the technical officers to help improve the ICT infrastructure in the schools for the sake of effectiveness.

The infrastructures are promising; the students in those schools that have access to the ICT facilities possibly will enhance teaching and learning effectiveness if properly harnessed. Additionally, the relatively high percentage of the schools connected

to the internet enables ICT-related activities and use of ICT facilities. Relating the use of computers and internet in the schools, majority of the schools visited indicated the intensive use of ICT facilities. The reasons for these results might be due to various strategies those schools use in maintaining the infrastructures and the facilities albeit government or ICT officers inspections or supervisions. Of course, the study brings up questions relating to the effective way to shape specific ICT access, utilisation and quality of those facilities in order to develop students' level of competence and probably take this advantage to develop further the teachers' pedagogical skills in ICT so as to improve on what students and teachers already do with ICT.

## REFERENCES

Adewale, J. G. (2004). Are Head Teachers' Leadership Techniques Predictors of Classroom Teachers' Motivation to Work?: A Study in School Effectiveness. ***West African Journal of Education (WAJE). (xxiv) 1. (pp 99-106.***

Adewale, G. (2005). Postgraduate Students' Use of Information and Communication Technologies in Educational Research: A Case Study of International Centre for Educational Evaluation (ICEE), University of Ibadan. ***Journal of Computer Literacy, Vol. 5, No 1.***

Adewale, G. (2006). Item Analysis of Life Skills Achievement Test for Nigerian Non–Formal Education Learners: Implications for MDGs. ***Adult Education in Nigeria. Vol. 13. (pp 77-92).***

Adewale, Gbenga Adesoji, Francis and Iroegbu, Thomas (2003) Science, Mathematics and ICT in Sub-Saharan Africa: The Nigeria Profile. Funded by Vrije Universiteit Amsterdam CIS (Centre for International Corporation) www.cis.vu.ni

Adeyemo, A. B., 2005. The open source business model and its economic implications for Nigeria and other third world economies. ***In journal of information technology***, 121- 128.

Akudolu, L. R., 2002. Restructuring Nigerain Secondary Education system througn ICT driven curriculum. ***Journal of the World council for Curriculum and Instruction Nigeria Chapter,*** 3(1), 7 – 17.

Aremu, A., 2002. ICT and the development of scientific knowledge and skills in primary school children. ***Nigerian Journal of Computer Literacy,*** 3(1) 1-9.

Asim, A. E., Kalu, I. & Ani, B. O. E., 2003. An assessment of ICTs Skills Development focus of computer Literacy centers in Cross River State, Nigeria. In Akale, M. A. G. (ed) ***STAN conference proceedings***, 9 – 13.

Atherton, J.S. 2003. Doceo: Competence, proficiency and beyond. http://www.doceo.co.uk/ background/expertise.htm

Ayodele, S.O., J.A. Adegbile, and J.G. Adewale. 2001. Evaluation studies. Ibadan, Nigeria: Power House Publication.

Bamikole, B. B. 2004. Evaluation of computer science curriculum in JSS in Oyo, Osun and Ogun States, Nigeria. Unpublished Ph.D University of Ibadan.

Becker, Wesley C., and Russell Gersten. 1982. A follow-up of follow through: The later effects of the direct instruction model on children in fifth and sixth grades. American Educational Research Journal 19, no. 1: 75–92.

Bloom, B.S., ed. 1956. Taxonomy of educational objectives handbook 1. Cognitive domain. New York: McKay.

Burts, Diane C., Craig H. Hart, Rosalind Charlesworth, and Michele DeWolf. 1993. Developmental appropriateness of kindergarten programs and academic outcomes in first grade. Journal of Research in Childhood Education 8, no. 1: 23–31.

Chun, L.W. 2005. Levels of computer competency amongst IPBA staff: A report. Journal
IPBA/Jilid 3: Bilangan 2: 17.

Colley , A & Comber, C., 2003. Age and gender differences in computer use and attitudes among secondary school students: what has changed? ***Education Research, June, 20003****, 45(2), 155-165*

Department of Education. 1998. Norms and standards for educators. Pretoria: Government
Printer.

Dreyfus, H.L., and S.E. Dreyfus. 1989. Mind over machine: The power of human intuition and
expertise in the era of the computer. Oxford: Basil Blackwell.
Education 3–13 11

Ekoko, P.O. 2002. Computerization of modern weapon system. ***Nigeria Journal of Computer Literacy,* 3(1) 26-31.**

Fabayo, R. O. 1999 Evaluation of Some Aspects of School Quality in Secondary School in Kwara State. An Unpublished Ph.D. Thesis of the University of Ibadan.

Falayajo, Wole, G.A.E. Makoju, P. Okebukola, D.C. Onugha, and J.O. Olubodun. 1997.
Assessment of learning achievement of Primary Four pupils in Nigeria. Lagos and Abuja,
Nigeria: Federal Government of Nigeria, UNICEF and UNESCO

Farombi, J. G. 1998. 'Resource Concentration, utilisation and management as correlates of students learning outcome. A case study in school quality in Oyo State. Unpublished PhD thesis, University of Ibadan. Ibadan, Oyo State Nigeria.

Federal Republic of Nigeria, 2004. ***National Policy on Education*** (Revised Edition). Lagos, NERDC Press.

Fraser, W. J. 1999. The foundations of continuous assessment: its link to performance-based, authentic, competence- based and outcomes-based assessment.

Fuller, B. (1986). Raising School Quality in Developing Countries. Washington, D.C. World Bank Discussion Paper; 2.

Jegede, P. O. 2006. A study of the predictors of teacher educators' behaviour towards ICT in furtherance Nigeria. Unpublished Doctoral Thesis: Obafemi Awolowo University, Ile-Ife, Nigeria.

Karchmer, R., 2001. 'The journey ahead: thirteen teachers report how the Internet influences literacy and literacy instruction in their K-12 classrooms. ***Reading Research Quarterly,*** 36 (4), pp. 442-466.

Leithwood, K. Jantz D. Steinbach R. (1999). Centrally initiated school restructuring in Canada. Paper presented at the I C SEI Conference, Leeuwarden, the Netherlands.

Mumtaz, S., & Hammond, M., 2002. The word processor re-visited: observations on the use of the word processor to develop literacy at key stage 2. ***British Journal of Educational***

Nigerian National Policy for Information Technology (IT), National Information Technology Development Agency.2000. http://www.nitda.gov.ng/document/nigeriaitpolicy.pdf

Obemeata, J.O. 2000. Principles of test construction. Ibadan, Nigeria: Sterling Horden.

Onwuakpa, F. I. W. 1998. An Evaluation of Some School Quality Indicators in Imo State Secondary Schools. An Unpublished Ph.D Thesis of the University of Ibadan.

Owens, R. G. 2004. *Organizational Behavior in Education: Adaptive Leadership and School Reform*, (8th Ed). Boston: Pearson Education.

Olagunju, A. M. 2003. Science Education Students' level of awareness and utilisation of ICTs: Implication for Tertiary Institutions. In M. A. G. Akale ***STAN conference proceedings.***

Rafi, N 1998. ICT Usage by students in an Israeli High school' ***Annual Review of Information science and Technology. 11-16, 1998***

Roth, R & Karsten, K. 1998. Computer Self-efficacy: a practical indicator of student computer competency in Introduction to IS courses.

Smith, S. M. 2004, Software Skills, Acquisition: Confidence versus Competence, ***Information Technology Learning and performance Journal,*** 22(2) 33-40.

Van der Horst H & Mcdonald R 1997. OBE*: Outcomes-based education: a* teacher's manual. Pretoria*:* Kagiso *Publishers. www.up.ac.za/saafecs/vol28/malan.pdf*

## Appendix

**Measure of competence among the students in the computer laboratory**

| SN | Skills observed to measure competence | S |
|---|---|---|
| 1 | Power on UPS and computer | 4 |
| 2 | Open a Microsoft page 2, type your name 1, school 1, class 1, and the number you are given today | 6 |
| 3 | Save your document on the desktop with your name | 2 |
| 4 | Open the saved document on the desktop | 2 |
| 5 | Type your family member names at least three, 1 marks for any two | 2 |
| 6 | Click file then save your document as Web page on the desktop | 2 |
| 7 | Click insert folder, then insert date and time e.g.15/03/2007 10:00:25 | 2 |
| 8 | Click insert folder again, then insert a pyramid or sphere | 2 |
| 9 | Type your name and class on the object | 2 |
| 10 | Use keyboard to print your document | 2 |
| 11 | Open an e-mail address, write on how you would like to be in future communicate with your teacher during long vacations in your document you earlier opened | 9 |
| 12 | Attach your document and mail to amooadesina@yahoo.co.uk | 5 |
| | Total | 40 |

Power on UPS and computer, Open a Microsoft page 2, type your name 1, school 1, class 1, and the number you are given today, Save your document on the desktop with your name, Open the saved document on the desktop, Type your family member names at least

three, 1 marks for any two, Click file then save your document as Web page on the desktop, Click insert folder, then insert date and time e.g.15/03/2009 10:00:25, Click insert folder again, then insert a pyramid or sphere, Type your name and class on the object, Use keyboard to print your document, Open an e-mail address, write on how you would like to be in future communicate with your teacher during long vacations in your document you earlier opened, Attach your document and mail to amooadesina@yahoo.co.uk