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Relationship between knowledge of information communication technology (ICT) and academic achievement of senior secondary school students in Nnewi education Zone of Anambra State

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Abstract

This research focused on knowledge of ICT and academic achievement of students in Anambra state. Five research questions and three hypotheses were formulated to guide the study. Correlational research design was adopted for the study. The study was carried out in Nnewi education zone of Anambra state. A total of 455 participants were selected from a population of 9105 senior students, using simple random sampling technique. A researcher crafted instrument titled knowledge of information and communication technology and academic achievement Questionnaire (KICTAA-Q), was used to collect data. In addition results of students achievements in maths and English was used to obtain data. A reliability index of.79 was obtainedusing Cronbach Alpha. Descriptive statistics and Pearson moment correlation coefficienttools were used to answer the research questions and test hypotheses. The result indicated thatthose who eagerly said they knew the ICT gadgets or material to use in practice did not know how to use them for achievement tests until after familiarization and hands-on use. The significant Relationship that existed negatively, (r = -.120; *p* =.01 for English test; r = -.131; *p* =.005 for Math) between what the students said they knew about ICT and how they tested, changed positively (r =.413; *p* =.0005 for English; r =.498; *p* =.0005 for Math) after exposure to hands-on. Based on the findings, the researcher recommends, among others, that teachers should be sensitized on the various ways and process-uses of ICT materials in classroom instruction and in test-taking.

Keywords: knowledge, information communication technology, academic achievement, senior secondary school students

Introduction

The millennium age is marked by an increased interest and attention given to computer knowledge and usage. Information and communication technology (ICT) comprises all electronic technologies used for information storage, retrieval, e-problem solving, and e-learning. The need for computer technology and computer literacy in the educational system has become more relevant according to Enuka (2000) [7]. Information and communication technologies (ICTs) provide strong roles in development and globalization Nwagwu (2006) [13]. ICTs have been found to have significant impact on all areas of human activity (Brakel & Chisenga, 2003) [3]. The Federal Government of Nigeria, in the *National Policy on Education* recognizes the prominent role of ICT in the modern world, and has integrated ICT into education in Nigeria (FRN, 2004). To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school, and at the junior secondary school, a computer education that has been made a pre-vocational elective. The need for ICT in Nigerian schools cannot be overemphasized. This calls for early acquisition of ICT skills by students. The ability to use computers effectively has become an essential part of all students' education skills such as research, communication, documenting, book-keeping, clerical and administrative work, stocktaking, and socializing. Some of these skills now constitute a set of computerized practices that form the core IT skills package such asspread-sheets, word processing, and databases (Reffell & Whitworth, 2002) [15]. There seems to be a mismatch between methods used to measure effects of ICT and type of learning promoted during ICT instruction. Successful utilization of ICT depends on the nature of the pedagogical force. As one of the key points in the hub of educational systems, teachers are believed to constitute an important aspect in students learning. Towards this end, Kessy (2006) [11], argues that advancement in the ICT in teaching of a course like biology is a crucial step in enhancing performance. The teachers may help their students to be familiar with faster development of ICT use. As it looks and generally believed, the knowledge young people have about computer and technologies tend not to relate to their academic achievement. This assertion cannot be made without an evidence- based study. Another dimension of this study is to examine if students knowledge of technologies relate to what they achieve in their subject-matter content. Anecdotal evidence abounds with the number of young people seen around with cell phones and other technological devices. This study looks at how the knowledge of these ICTs uses relate to academic achievement that goes on in the classroom.

Academic achievement is the extent to which a student, teacher or institution has achieved their short or long-term educational goals. Cumulative grade point average (CGPA), such as in the secondary schools and university levels, is made up of all graded continuous assessment class work and terminal or semester examinations. Individual differences in academic performance have been linked to differences in

intelligence and behaviours. Students with higher mental ability are believed to demonstrate a higher IQ when they are tested. Academic achievement has been found to significantly relate to motivation. Motivation is believed to be the moving force behind a student's learning behaviours (Woolfolk, 2010) [16]. Hussain, & Suleman (2017) [9] in a study on effects of Information and Communication Technology (ICT) on students' academic achievement and retention found that ICT was more compelling, effective and valuable in teaching when contrasted with conventional techniques of teaching. In a similar study, Khattak and Jan (2015) [12] reported that ICT help students to work in teams and share ideas related to the curriculum.

The findings by Hussain and Suleman (2017) [9] revealed that there exists a relationship between ICT adoption and academic performance in a conservative environment with improvement of the performance of female students more than the male. Ishaq, Azan, Zin, Rosdi, Abid & Ijaz (2020) noted that many students used ICTs in order to improve their essential skills and to carry out their learning effectively with much involvement. It has also been established that the productive use of ICTs has had a substantial significant impact on the students. Research has also found that students with higher academic performance, motivation and self-regulation use intrinsic goals rather than extrinsic stimulations (Zimmerman & Schunk, 2002). Despite the huge importance of ICT in education, Nigeria, like other developing countries, is still in the initial stages of integrating ICT into teaching and learning processes in the education sector. Though it is limited by a number of barriers, there are many factors influencing the use of ICT to make teaching and learning effective in Nigerian classrooms. Enhancement of teaching and learning through the use and knowledge of ICT is a popular presumption. Studies need to be done in Nigerian classrooms to provide evidence-based information related to whether use and knowledge of ICT have any relationship with academic achievement of students.

There is no evidence for any relationship between increased educational use of ICT and students' academic performance. In fact, there is consistently negative and marginally significant relationship between ICT knowledge use and students' academic achievement measures. Meanwhile, the general notion is that the more knowledge a student has in the use of ICT, the smarter the student is with school work. There seems to be a discrepancy with regards to whether knowledge and use of ICT make students achieve more in academics. The researcher wishes to verify these discrepancies with an evidence-based enquiry. In a similar note, boys' and girls' performance have always attracted attention with regards to how to are they are similar or different. Though gender is not a main variable for this study, the researcher would also like to know if gender has any relationship with knowledge use of ICT in test-taking. Specifically, the researcher wishes to document an evidence-based argument with regards to whether knowledge use of ICT relates to academic achievement among secondary school students in Anambra State.

Purpose of the Study

The main purpose of this study was to find out if there is relationship between the students' knowledge of information and communication technology, and academic achievement among senior secondary school students in Anambra state. Specifically, the study sought to:

1. Examine students' knowledge of ICT materials and gadgets related to test-taking.
2. Classify ICT materials and gadgets related to students' knowledge use of them in classroom tests.
3. Describe observed hands-on related students' ICT knowledge use in test-taking.
4. Identify gender relationship to knowledge use of ICT in achievement testing.
5. Find out the relationship between ICT knowledge use and senior secondary students' academic achievement in English and maths.

Research Questions

The following research questions guided this research work.

1. How much knowledge of ICT materials and gadgets do students have in test-taking?
2. How is students' knowledge use of ICT classified in classroom testing?
3. How does hands-on use of ICT knowledge relate to test-taking?
4. What is the relationship between gender and ICT knowledge in achievement testing?
5. What is the relationship between ICT knowledge and academic achievement?

Hypothesis

The following null hypothesis was tested at a value of $p<.05$ significant level, to further investigate proofs of some probabilities.

H_0 1. There would be no significant relationship between students' hands-on use of ICT and their achievement in English and Maths.

H_0 2. There would be no relationship between being a male or female student and participants' knowledge use of ICT in achievement testing.

H_0 3. There would be no relationship between students' knowledge of ICT and their achievement in English and Maths.

Research Design

In quantitative models, there are the correlational, the survey and the experimental designs (Nworgu, 2015, Creswell, 2009). This study employed a correlational design. Correlational designs seek to establish relationships that exist between two or more variables. It helped the researcher to collect and analyse data on the relationships between the knowledge of ICT and academic achievement of senior secondary school students in Anambra State.

Area of the Study

This study was carried out in Nnewi education zone of Anambra State of Nigeria. According to statistical records available, the indigenous ethnic groups in Nnewi are Igbo (100%). Nnewi is located in the south eastern of Nigeria. Nnewi is the second largest city in Anambra state. As at 2006, Nnewi has a population of 391,227 according to the Nigeria census. The city spans over 1,076.9 square miles (2,789km^2) in Anambra state. Nnewi education zone are made up of 4 local governments, they are Nnewi north, Nnewi south, Ekwusigo and Ihiala local government. Nnewi

people are known for business and industriazation. Nnewi education zone was selected for the study due to its characteristic nature such as urbanization and commercialization. Nnewi education zone has 50 schools with a total population of 9105. Only public senior secondary school students participated in the study.

Population of the Study

The population of the study comprised all the senior secondary school students in Nnewi educational zone of Anambra State. As earlier noted, Nnewi educational zone has fifty (50) public senior secondary schools and this has a population of 9105 students. All the schools studied were identified as those who use computers and other ICT gadgets.

Sample and Sampling Technique

The sample of this study was 455students drawn from 10 senior secondary schools in Nnewi education zone. Nnewi education zone has four local government areas in it. Five Percent of the population was taken as the sample because the population runs in thousands. Hence, Ejifugha (1998) [6] recommended that if the population is in few hundreds, the sample size shall be (40%), if the population is in many hundreds, (20%) of the population shall be considered appropriate for the study but if the population runs in thousands, (5%) of the population is considered appropriate for the study. Multi-stage sampling procedure was used for the sampling through the use of simple random sampling technique. Firstly, simple random sampling technique through balloting was used to select ten 10 public secondary schools from the 50 public secondary schools in Nnewi Education Zone of Anambra State. All the secondary students of year II (SS II)from these 10 schools drawn with ballot. Simple random sampling technique, as Nworgu (2015) notes, gives each element in the population equal and independent chance of being included in the sample. Simple random sampling technique was used in selecting the schools as to give every school equal chance of being selected and included in the study.

Instrument for Data Collection

To facilitate effective data collection for the study, a set of thirty structural questionnaires was designed by the researcher termed Knowledge level of ICT and Academic Achievement (KICTAA-Q). Section A of the questionnaire contained questions on personal data of the respondents, while section B contained information on ICT knowledge. Section B is divided into three parts tailored to address the research questions. The KICTAA – Q instrument carry a categorical scale of *true* or *false*. Another response pattern was used to elicit hands-on knowledge-use when the ICT materials and gadgets were presented namely *frequently used, sometimes used, seldom used* and *never used*

Validity of the Instrument

The initial draft of the instrument was given to three experts for face and content validation they includes an educational psychologist, and two educational Psychometrists, from University of Nigeria, Nsukka and Chukwuemeka Odumegwu Ojukwu University. They independently validated the instruments in view for reliability determination. These experts are professors in their field. They were requested to critically examine the instrument in terms of clarity, relevance and appropriateness of the items in the cluster for its corresponding research question, and also on the suitability of the rating scale. The comments from these experts including my supervisor's comment were taken into considerations while developing the final draft of the instrument.

Reliability of the Instruments

To ascertain the reliability of the instrument, the instrument was trial tested on 20 students drawn from public senior Secondary school outside the study area in Onitsha Education Zone of Anambra state. Onitsha education zone is outside the studied population but has similarity with the studied education zone, namely it commercialization and urbanization characteristics. Cronbach Alpha Reliability Coefficient technique was used to calculate the internal consistency of the scores. The reliability coefficients of 0.79 and 0.78 were obtained for the two clusters of the instrument. The overall reliability coefficient of the instrument was 0.86.

Method of Data Collection

The researcher used direct delivery method with the help of trained research assistants to administer the instrument to the respondents. The researcher in administering the instrument instructed the respondents on how to complete the questionnaires and retrieved back from the respondents immediately they finished filling them. Immediate retrieval of the copies of the questionnaires from the respondents was to ensure hundred Percent return rate.

Method of Data Analysis

For analysis of data, appropriate statistical tools from Statistical Packages for Social Sciences (SPSS) were used. Specifically, Pearson moment correlation coefficient and analysis of variance (ANOVA) were used as means of breaking down and analysing the generated data. Neither a pre-test nor post-test was given to the student-participants; so ANOVA was deemed the most suitable. For repeated mean measures, a *p-value <.05* was used to determine significance level for all calculations. An analytical module shown below was used to help to direct the researcher during a step-by-step addressing of research questions.

RQ 1: KICTAA – Q 1 – 10 was used to address researcher question one

RQ 2: KICTAA – Q 11 – 20 was used to address researcher question two

RQ 3: KICTAA – Q 21 – 30 was used to address researcher question three

RQ 4: Sex was factored into KICTAA-Q to address research question four

RQ 5: To address research question 5, mean score of KICTAA – Q 1 – 30 was used to compare with the mean achievements scores in selected subjects.

Only completed instruments were used for data analyses. There were three KICTAA-Q not fully completed. The researcher strategically removed these three uncompleted questionnaires.

Results

This chapter presented and described the result of the study according to the research questions and hypotheses of the study. The summary of the findings were also highlighted.

Research Question One

How much knowledge of ICT materials and gadgets do students have in test-taking?

Table 1: Students' Responses to the Item Descriptors to KICTAA-Q 1 – 10

S/N	Item Description	True False
1	I know how to use computer to take tests in English and Mathematics	78(17%) 374(83%)
2	My teacher uses projector to teach us.	92(20%) 360(80%)
3	We use different computer gadgets to learn and take tests.	58(13%) 394(87%)
4	I know how to use power point (ppt) to do personal project.	77(17%) 375(83%)
5	I know the names of all the computer gadgets and materials we use in taking tests	69(15%) 383(85%)
6	I have access to all computer materials and gadgets in our school for individual use.	103(23%) 349(77%)
7	We use computers to do collaborative learning exercises such as discussion.	89(20%) 363(80%)
8	We use projector as a class for group tests.	97(22%) 355(78%)
9	We use scientific calculators to learn take class-tests in mathematics.	45(10%) 407(90%)
10	We use different ICT gadgets in learning and testing all subjects.	219(48%) 233(52%)

In answer to research question one (RQ 1) as seen in Figure I, the researcher found out that students who responded categorically *"false"* to all the items of Nos. 1 to 10 outnumber those who said *"true"* to the same response items. This suggests that students have minimal to no knowledge of ICT materials and gadgets when it comes to test-taking.

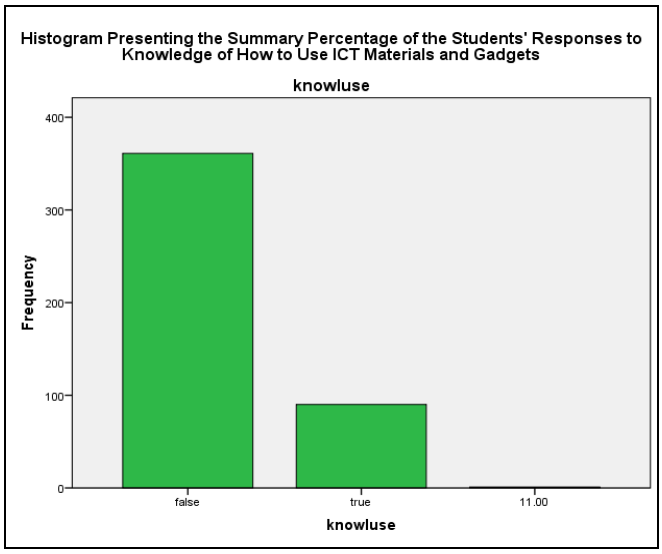

Fig 1: Percentage of the students' responses to knowledge of how to use ICT materials and gadgets

Research Question Two

How is students' knowledge use of ICT classified in classroom testing?

Table 2: Students' Responses to the Item Descriptors to KICTAA-Q 11 – 20

ICT	Frequently used Sometimes used Seldom used Never used Missing /Incomplete	Total
Sci Calculator	353(78%) 40(9%) 36(8%) 14(3%) 9(2%)	100%
Social Media	5(1%) 5(1%) 5(1%) 419(93%) 18(4%)	100%
Internet	5(1%) 18(4%) 32(7%) 379(84%) 18(4%)	100%
Projector	5(1%) 23(5%) 72(16%) 339(75%) 13(3%)	100%
Computers	40(9%) 203(45%) 167(37%) 36(8%) ---	99%
Programming	9(2%) 27(6%) 226(50%) 167(37%) 23(5%)	100%
TV/Radio	--- --- --- 416(92%) 36(8%)	100%

In answer to research question two (RQ 2) the researcher observed through opinion sampling that students used scientific calculator the most (*frequently used* = 78%) followed by their use of computer (9%) in classroom testing, (see figure II below). From Table Two above, 45% of the respondents reported that they sometimes used computers. However, only 6% of the respondents said that they use programming insinuating that the 45% *sometimes used* of computers could be for other purposes than for programming. From the report, recorded in Table Two in answer to research question two, students said they never used TV/Radio in classroom testing. Insignificant number percentage of student participants reported that they *frequently used* social media (1%), Internet (1%), projector (1%) and programming (2%) in classroom testing. The researcher noted that only one school sampled used these ICT materials and gadgets and only five students who chose computer as option were using them for classroom testing.

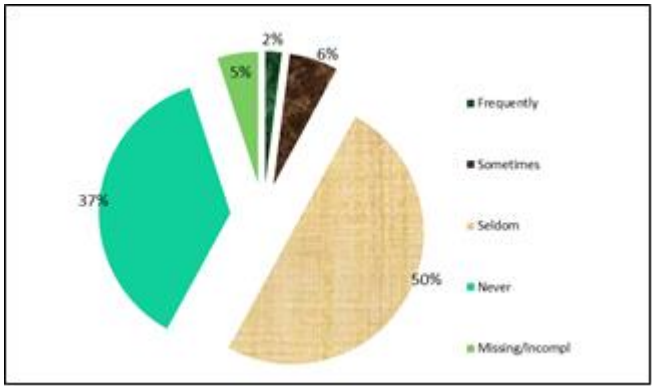

Fig 2: (A) Knowledge Use of ICT Classified for Programming

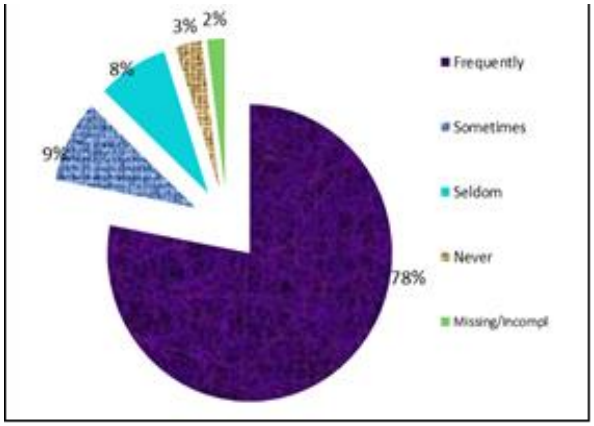

Fig 3: (B) Knowledge Use of ICT Classified for Scientific Calculator

The researcher is particularly interested in the use of

scientific calculator and programming for the test presented during the study. These two are supposed to be the most commonly used, namely scientific calculator for Mathematics and programming for English language.

Research Question Three: *How does hands-on use of ICT knowledge relate to test-taking?* To answer research question three (RQ 3), the researcher provided impromptu hands-on for concrete experiences for one week. Some ICT gadgets and materials such as scientific calculator, word documents, power point animations (ppt), TV/Records, were presented to students for classroom tests, in order to observe the actual knowledge use of these. This was in effort to match participants' responses to KICTAA-Q 21–30 to their actual experiences of taking the English and Maths tests presented. The researcher observed that participants' achievement chart was discontinuous not linearly continuous (more for English testing than for Maths testing) depending on which ICT gadget was presented, (see figure III below). Students' chart dropped significantly when they were expected to take oral tests with gadgets such as radio or recorded device. Those students who were savvy with the use of computer gadgets out-performed. This was not because of cognitive ability but because they were faster since the impromptu tests were timed.

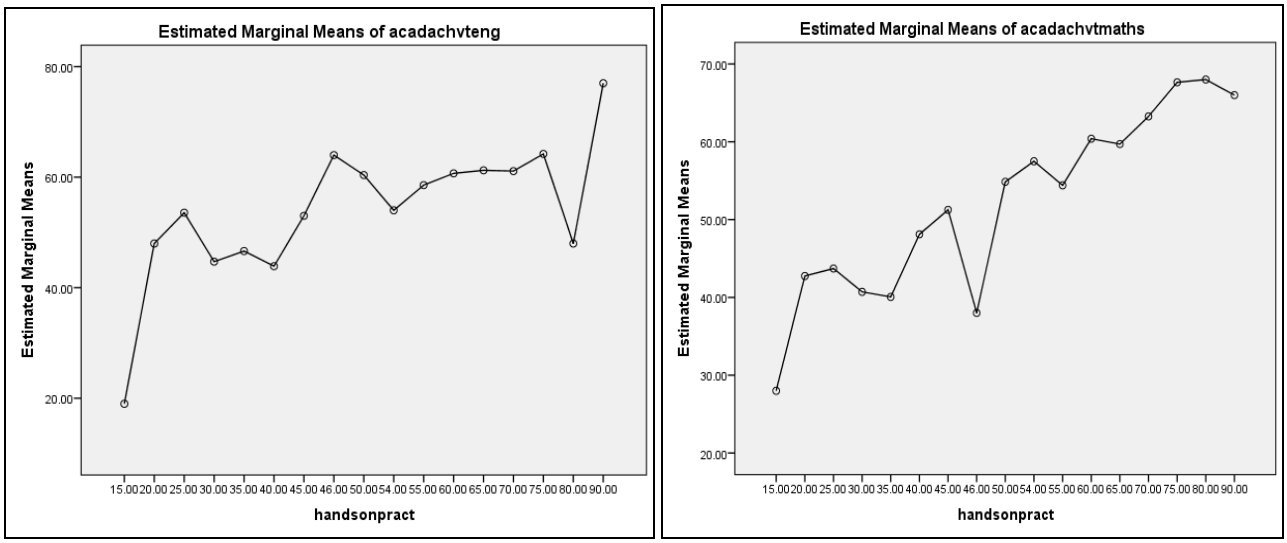

Fig 4: Relationship between hands-on use of ICT and Testing in English and Maths

H₀ 1*There would be no significant relationship between students' hands-on use of ICT and their achievement in studied subjects*

Pearson moment correlation coefficient test revealed a report for relationship between English achievement and KICTAA Hands-on (r =.41; N = 452; and significance of *p* =.0005 (one tailed); and Maths achievement and KICTAA Hands-on (r =.50; N = 452; and significance of p =.0005) (*See Appendix G, for detailed computation of the analysis*). The report presented that students were more used to scientific calculator in solving Maths problems than they were used to programming.

Research Question Four *What was the relationship between gender and ICT knowledge use in achievement testing?*

The researcher wished to know if being a boy or a girl student had any significance in their responses to KICTAA and use of ICT to test studied subjects. In answer to this research question, the researcher found that boys responded more quickly and actively to either the introduction or the use of ICT to learn and to test, than their counterpart girls. Boys asked questions at places where girls shied away.

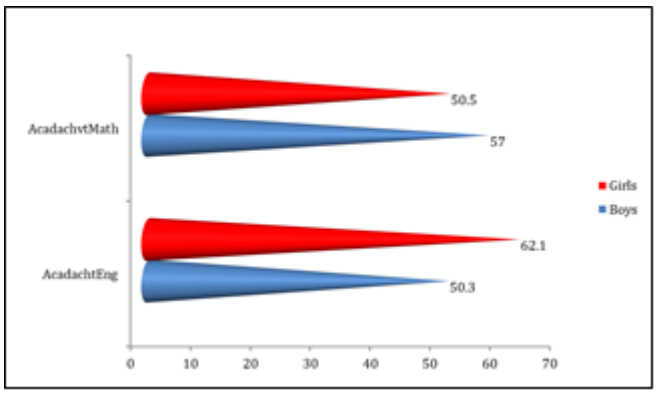

Fig 5: chart of gender responses to knowledge use of ICT in mathematics and English

H₀2: *There would be no relationship between being a male or female student and participants' knowledge use of ICT in achievement testing.*

Gender alone had significant relationship with ICT knowledge use (r =.46; n = 452; p =.0005 in English and r = -.23; n = 452; p =.0005 in Mathematics. This is to say that male and female students differed significantly in their knowledge use of ICT to test in English and but negatively in Maths. Critical analysis observed that the female students' sharp drop from mean score of 62.1 for English to mean score of 50.5 for Maths caused the negative skew.

Research Question Five: *What was the relationship between ICT knowledge use and academic achievement?*
To answer research question five the researcher observed that students showed variance in their knowledge of ICT materials and gadgets, and their use of same ICT materials and gadgets in test-taking, especially in Mathematics more than in English that served as the studied subjects. Knowledge of ICT materials was operationalized by simple identification. Those who eagerly said they knew the gadgets or material to use scored very poorly until after one week of familiarization and hands on use. The relationship between hands-on and the tests proved positive as shown above. Discussions about these analyses are presented in greater details under chapter five.

$H_0$3: *There was no significant relationship between knowledge use of ICT and academic achievement.*

The researcher further tested the probability for relationship between the mean score of participants' responses to their knowledge of ICT gadgets and materials and their final test scores in English and Mathematics. The general report of analysis, therefore, presented that those students who were savvy with ICT materials/gadgets achieved more when English and Maths were presented for test-taking. The significant relationship that existed negatively, (r = -.120; *p* =.01 for English test; r = -.131; *p* =.005 for Math) between what the students said they knew about ICT and how they tested, changed positively after exposure to hands-on. (*see appendix I*)

Discussion of the Findings
Interesting dynamics revealed themselves during data collection and computation. The researcher observed that all the participating schools have computers – some adequate number, and some inadequate numbers. Nonetheless, the researcher observed that a good number of these computers are out-of-service or not fully functioning. Five out ten schools studied reported that they have more than 100 computers extras that were unpacked and in the store for 20 months and above. One of the teachers in Anglican girls secondary school Nnewi said, "*We are waiting for school administrators to invite experts to come and install some software's so we can start using it in teaching the students*". For many schools, availability of computers was not an issue.
Another phenomenon emerging from this study is a prevalent non-use of available computers and ICT gadgets such as scientific calculators. 95% of the schools studied reported that they rarely use computers for testing subjects other than computer classes. The reason offered to the researcher was that the teachers of the studied subjects, namely English and Mathematics, do not know how to use these computer gadgets such as review page and scientific calculators to teach and test English and Mathematics respectively. This discussion is carried out based on the findings of the research questions and the hypotheses.
The analysis of the data on table 1 in chapter four arising from research question one sought to find out how much knowledge of ICT materials and gadgets students have in test-taking. The analysis revealed that students have minimal to no knowledge of ICT materials and gadgets in test-taking. The response to item no 10 received the highest score of positive response. This is because students were thinking of all ICT materials and gadgets including cell phone, printed materials and calculators. Indication is that students are only aware of ICT materials and gadgets used in and out of classroom. From the same Table 1 of KICTAA, *we use scientific calculator to learn and take test in mathematics* received the least percentage. 10% of the students responded positive to this question. This is most surprising to the researcher because scientific calculator should be the most frequently used ICT gadget in secondary school in Mathematics learning and testing. This gadget is allowed for standardized testing such as WAEC, NECO, JAMB, etc. Almost all the question descriptors got high percentage of false except item that states *we use different ICT gadget in learning,* (see figure I).During interactive sections with the students, the researcher observed that learning has ramifications that need to be discussed. When students were asked to describe learning, they argue that learning include everything they do with their phone at home. For these participating students, they do not limit their learning to the classroom instruction. Some of them argue that when their teacher finishes, they go home to browse and check. They also claim that they solved algebra equation with scientific calculator from watching a television programme at home.
Research question two that sought to find how Students' knowledge use of ICT is classified in classroom testing were rated with *frequently used, sometimes used, seldom used, and never used.* The ICT gadgets, radio and television attracted the highest percentage of *never use.* Brown, (2009) considered the following ICT materials as generally useful for the teaching of mathematics, namely Scientific calculators, Computers, Cell phones, Televisions, Radios, Internet, Weather focus devices, Audio visual devices, Magnetic compasses. Considering all these, the most available to the students would include, scientific calculator, radio and televisions. Meanwhile, the researcher observes that these basic ICT gadgets are not used for students learning and test-taking. Even though students do not use scientific calculator in taking test, the researcher observed that it attracted the highest percentage of *frequently used*. Even if the use is for adding and subtracting during test taking it is a use. Social media and internet received 1% use each for testing. This does not surprise the researcher because in as much as students claim to know how to use phone for social media/internet browsing and the use school projector to learn, these ICT gadgets are not used in test-taking and examination. So they may have nothing to do with students' achievement in terms of causation. For the purpose of this study, the researcher underscored the use of scientific calculator and programming for learning and testing. This is because these two are the most commonly used, calculator for Mathematics and programming for English. Meanwhile, the study discovered that these ICT materials and gadgets are not put to the most use in senior secondary schools.
Research question three: The researcher provided some ICT gadgets and materials such as scientific calculator, spreadsheets documents, power point animations (PPT), TV/Records, in order to observe the actual knowledge use of these. This was in effort to match participants' responses in the questionnaire to their experiences. The researcher observed that participants were eager to know how these gadgets and materials could be used. Their knowledge use of these ICT gadgets and materials to answer subject

questions were timed and scored. Maximum score obtainable by a student was 200 and minimum was 40. The researcher noticed that some of the responses the students provided in the questionnaire did not match their experiences when the researcher provided the hands-on materials and gadgets. Take for instance, students answered true to *I know how to use power point (PPT) to do personal project and frequently used to projector use in the class room.* The same students said they had never seen projector and power point (PPT) when presented.

In answer to research question four, the researcher found a significant relationship between gender and ICT knowledge use, with regards to achievement test in the studied subjects, namely English Language and Mathematics. Boys performed better than girls in the use of ICT for Mathematics and English. However, within group analysis revealed than girls score in English is higher than their score in Mathematics. The boys score for Mathematics is higher than their score in English. Thus goes to say that male students are more assertive when it comes to ICT knowledge use, than female students.

To answer research question five and test H_0 2, the researcher observed that students showed variance in their knowledge of ICT materials and gadgets, and their knowledge use of ICT materials and gadgets in test-taking, especially Mathematics more than English that served as studied subjects. Take for instance the scores on Tables 1 and 3 about frequent use of scientific calculator. For ICT knowledge, student participants scored 353(78%) under *frequently used*, but for knowledge use students participants scored 59 (13%) under *frequently used.* Meanwhile, these participating students score 9(2%) for ICT knowledge use of the same materials. It seems participants do not know that programming is something they already do but do not they do it. That being said, the researcher wishes to note that using these available gadgets and materials will not only help students in their learning and test-taking, but will enable them identify these materials and gadgets when presented.

Implication of the Study

In naming the ICT materials and gadgets all the participants scored a pass mark of 100% out of 200 maximum. Participants were not conversant with the knowledge use of these ICT gadgets and materials for testing particularly in the Mathematics. This implication could provide some explanations why some Nigerian students perform poorly in Joint Admission and Matriculation Board (JAMB). They struggle in their use of computer and other ICT gadgets during this examination because they were not knowledgeable in their use for learning and testing. The result is that, not knowing how to use ICT in test-taking may adversely impact a student's achievement grade when ICT materials and gadgets are used, such as in the Joint Admission Matriculation Board (JAMB) tests or Post Unified Tertiary Matriculation Examinations (Post UTME).

Another implication from the study is the mismatch between students' responses to KICTAA and their experiences when ICT materials and gadgets were presented. The researcher wishes to note that students' might not know that their responses would be tested with hands-on. This accentuated that even the scores received for time and *frequently used* might be a misrepresentation of students' knowledge of ICT materials/gadgets and their uses in test-taking. This is to say that students might know the name of an ICT material such as programming or ICT gadget such as projector, but same students might not know how these materials and gadgets are used in learning or testing. In this research the findings showed that students have no knowledge of ICT materials and gadgets in test-taking. This indicates that students are only using it in class when they do, but not in test-taking.

Conclusion

In this age and time when computer knowledge use in the classroom has proven to be most efficient ways to enhance learning among students, it becomes necessary that Nigerian students should be taught the use of computers in learning. Nigeria introduced computer based tests (CBT) for some of standardized tests such as JAMB. It becomes imperative that knowledge and use of computer and other ICT gadgets/materials should be made available to senior secondary students. As this study concludes, the researcher wishes to note that Nigeria students may continue to be disadvantaged during such international or standardized tests if they do not have adequate experiences and hands-on learning with ICT knowledge use in the classroom.

Unlike the study conducted by Anujeonye (2004) and contrary to her views, this research discovered that the problem of availability of ICT materials and gadgets seem not to exist in Anambra state schools. What this research discovered is that the students are not taught how to use these ICT materials and gadgets in their classroom learning and testing. Even when these ICT materials and gadgets are used minimally in learning, they seem almost seldom used in classroom test-taking in subjects like English and Mathematics. This concluded research also sharpens out the fact that there are some of the ICT materials and gadgets which students know, but do not know how to use them. These materials and gadgets may fall into the category of Aladejana and Aderibigbe (2007) [1] termed NKS (new kind of science). They may not be NKS because of their easy availability but they are definitely new to the students because materials and gadgets are not used in their learning and test-taking.

Recommendations

1. Based on the findings of this research, the the following recommendations are made. Teachers should be sensitize on the various ways and process of using ICT materials in teaching and in test taking of all their subjects through workshops, seminars, and conferences.
2. The government should ensure that the computers donated to the schools should all be put use to the benefits of the students.
3. The government in consultation with the school administration should train more teachers on the use of computer to improve learning.
4. The government should add computer courses to those studying education in the university because one cannot give what he/she does not have.

Suggestions for Further Studies

The following were given as suggestion for further studies:

1. Relationship between knowledge of information and communication technology (ICT) and academic achievement of students in Nigerian universities
2. Impact of teachers on the use of ICT in Nigeria classroom

3. Investigation into the survey factors militating against effective use of ICT in teaching and in test taking in Nigeria classroom.

References

1. Aladejana F, Aderibigbe O. Science laboratory environment and academic performance. Journal of Science Education & Technology,2007:16(6):500-506.
2. Anujeonye NC. Assessment of availability and usage of computer and its gadgets for teaching and learning in secondary schools in Oshimili South Local Government Area of Delta State. *ANSU Journal of Educational Research*,2014:2,23-29.
3. Brakel PA, Chisenga J. Impact of ICT based distance learning: The African story. *The Electronic Library*,2003:21(5):476-486.
4. Brown E. A.V. *Instructional technology media and technology*. New York: MacGraw-Hill, 2009.
5. Creswell J. *Educational research: planning, conducing and evaluating quantitative and research.* Upper Saddle River, Boston: Pearson, 2009.
6. Ejifugha AU. Fundamentals of research. *Benin. Ball*, 1998.
7. Enuka UA. Breaking down the walls: Computer application in correctional/prison education. *Benin Journal of Educational Studies 12/13*,2000:(1/2):64-71.
8. Federal Republic of Nigeria. National Policy on Education. Lagos: NERDC Press, 2004.
9. Hussain I, Suleman Q. Effects of Information and Communication Technology (ICT) on Students' Academic Achievement and Retention in Chemistry at Secondary Level. *Journal of Education and Educational Development*,2017:4(1):73-93.
10. Ishaq K, Azan N, Zin M, Rosdi F, Abid A, Ijaz M. The impact of ICT on students' academic performance in public private sector universities of Pakistan. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*,2020:9(3):1117-1121.
11. Kessy C. *The state and schooling in Nigeria.* London: Oxford University Press, 2006.
12. Khattak R, Jan R. The impacts of ICT on the students' Performance: A Review of Access to Information. *Res Human Soci Sci*,2015:5(1):85-94.
13. Nwagwu WE. Integrating ICTs into the globalization of the poor developing countries. *Information Development*,2006:22(3):167-179.
14. Nworgu BG. *Educational research basic issues & methodology.* (3rd ed.). Nsukka, Enugu State: University Trust Publisher, 2015.
15. Reffell P, Whitworth A. Information fluency: Critically examining IT education. *New Library World 103* (1182/1183), 2002, 427-35.
16. Woolfolk A. *Educational psychology*. Upper Saddle River, NJ: Merrill/prentice Hall, 2010.
17. Zimmerman BJ, Schunk DH. *Self-regulated learning and achievement.* Mahwah, NJ: Lawrence Erlbaum, 2002.