ICT Use Skills As A Correlate of Secondary School Students’ Mathematics Performance in Ibadan, Nigeria

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**Abstract**

*The study investigated the relationship between Information Communication use skills and the academic performance of students in selected secondary schools in Ibadan, Nigeria. The descriptive survey research design was adopted. The population consisted of 500 secondary school II (SS2) students in selected secondary schools in Ibadan and a convenience sampling technique was used to select 250 SS2 mathematics students as sample for the study. A structured questionnaire was used to collect data on ICT usage skills of students while the Mathematics Achievement Test (MAT) was used to measure students’ achievement levels in mathematics. The MAT consist of twenty-five items of multiple-choice objectives. Frequency counts, percentages, mean, and standard deviation were used to answer the research questions, while Spearman rho was used to test the research hypothesis using the Statistical Package for the Social Science (SPSS). The result of the study revealed that students have some skills required to enhance their academic achievement. These skills are essential in their academic pursuits and will help them perform better academically. There was a negative relationship between ICT use skills and students’ achievement in mathematics which is significant at 0.05. From these findings, it is hereby concluded that Information Communication Technology (ICT) is of great importance in our secondary education, but it does not positively correlate with the academic performance of students in the selected schools. The researcher suggests that a longitudinal study that would employ quasi-experiment research design should be conducted to investigate the relationship between ICT skills and students’ achievement in mathematics.*

**Keywords:** ICT, ICT Use Skills, Achievement, Mathematics

**Introduction**

Revolutionary developments driven by information and communication technology define the world of today. Information and Communication Technologies (ICT) is a broad term that includes the collection (acquisition), organization (packaging), storage, and retrieval (dissemination) of information in textual or numerical (books, documents), visual and aural (audio-visual), or a combination of all of the above (multi-media) forms (Bappah, 2010). Therefore, in this study, information communication technology can be characterized as a world of electronic and communication devices that collect data and information, produce it, process it, store it, retrieve it, and distribute it via internal and external network technology.

Preparing students for the pervasiveness of technology in the Internet age is the most frequent justification for employing information and communication technology in the classroom. Despite

the importance of information and communication technology (ICT) in education, ICT's success and achievements depend on teachers having the various types of knowledge needed to incorporate ICT use skills into the teaching and learning process and be able to teach these skills to the students. Information and communication technology (ICT) tools, such as computers and internet use, can support students in the self-coaching process by assisting in the development and improvement of their knowledge content in various areas and by helping to clarify ambiguous themes.

Students' involvement in class, completion of homework assignments, tests, and participation in competitions and other events are all factors that affect their academic performance. There are many different ways that academic success in school is assessed. Students demonstrate their knowledge for regular grading by taking written and oral exams, giving presentations, turning in their homework, and taking part in class activities and discussions. To assess a student's performance, teachers use assignments, tests, and examinations. Poor academic performance is a performance that is deemed to be below an expected standard by the examiner and some important people (Adesemowo, 2005).

According to Baek (2010), who conducted an ICT literacy study with three groups of students with different levels of school performance (good, sufficient, and insufficient), the group with a good school performance demonstrated a level of ICT literacy higher than the other groups, academic performance has also been a significant factor in ICT literacy. Additionally, it is thought that students who have access to ICT and who attend schools with positive home and school climates perform better academically. It is crucial to note that teachers are a key determinant in ensuring that students accomplish well academically and that they play a very major and critical role in defining the quality of education that children get.

Thus, in determining academic achievement, Adeyemi and Bolarinwa (2013) emphasized the use of grades in examinations and reported that grades could serve as predictive and criterion measures. Academic performance could be measured in several ways like CGPA, GPA, standardized tests and examination results. Most researchers around the world use the GPA to measure student performance in a particular semester while some others measure students’ performance through the result of particular subjects in a previous academic term or session for secondary school students. The most well-known measure of academic accomplishment is students' grades. Grades serve as the student's overall tenure and academic "score" for each class. The majority of the time, grades are calculated by adding up or averaging exam and assignment results. Attendance and the instructor's assessment of the student may also have an impact. The grading methods used in schools vary widely; typical scales include percentages from 1 to 100 and letter grades from A to F.

Therefore, a number of factors, including student inability to manage their time, peer influence, school environment, school facilities, information resources, family factors, parents, teachers, and curriculum, may be to blame for secondary school students' poor academic performance. The declining student performance in public exams has drawn the serious concern of experts and evaluators. A significant aspect that may affect children's academic success is school resources. It is crucial to provide resources in schools that can be used to raise students' academic achievement. The necessary materials should be included in the textbooks, notes, learning materials, handouts, technology, library facilities, and lab facilities, particularly in science courses. Students will be better equipped to understand academic concepts and how to conduct experiments when they are given the required instruments and equipment. In some instances, students—particularly those from disadvantaged, marginalized, and socioeconomically disadvantaged sections of society—cannot afford the books and materials necessary for learning; as a result, they depend on the resources provided by libraries and other students to get the books and other materials (Maina, 2010).

**Statement of the problem**

In-depth research has been done over the past 20 years on the relationship between ICT use and students' academic success. In reality, other academics claimed that there is no proof linking increased ICT use in school to improved student academic performance. These claims are supported by the fact that some students may utilize ICT to extend their free time and reduce their study time. Based on this, it is plausible that students' use of ICTs has pros and cons. On the one hand, using ICTs for academic-focused reasons results in considerable increases in students' academic achievement. ICTs, on the other hand, may have a negative effect on students' academic performances if they are utilized for non-academic activities that divert them from crucial academic duties and activities. This means that effective ICT use if its potential is appropriately regulated and channelled for academic objectives, is directly associated with favourable outcomes for students. Perhaps they are unaware of the potential harm that information and communication technologies may do to their academic performance. This study was conducted to ascertain the association between information communication technology use abilities and the academic performance of pupils in senior secondary schools in Ibadan in light of these worries.

**Objectives of the study**

1. Find out the types of Information Communication Technology facilities used by secondary school students.
2. Determine the Information Communication Technology use skills possessed by Secondary school students.
3. Ascertain whether the Information Communication Technology use training platform(s) is or are available to Secondary school students.
4. Ascertain the extent Computer Based Technology integrated into the teaching-learning activities.
5. Determine the relationship between Information and Communication Technology use skills and academic performance in mathematics of senior Secondary school students II(SS2).

**Research questions**

The study raised the following questions that were answered in the course of the research.

1. What are the types of Information Communication Technology facilities used by secondary school students?
2. What are the Information Communication Technology use skills possessed by Secondary

school students?

1. What Information Communication Technology use training platform(s) is or are available to Secondary school students?
2. To what extent is Computer Based Technology integrated into the teaching-learning activities?
3. What is the relationship between Information and Communication Technology use skills and academic performance in mathematics of senior Secondary school students II(SS2)?

**Literature Review**

Effective use of ICT tools for the instructional process in the field of education strengthens the teacher's capacity to accommodate individual differences and promotes learners' involvement, participation, and understanding (Hussain, Iqbal, & Akhtar, 2010). High academic accomplishment is encouraged as a sign of high-quality learning outcomes when ICT resources are used effectively. According to Lavy (2011), both traditional (classroom instruction that prioritizes imparting knowledge and comprehension) and modern (use of technologies that equip students with analytical and critical abilities) styles of instruction have a significant positive impact on students' achievements. ICT accessibility and availability shouldn't have an impact on student's academic performance; nevertheless, this depends on if and how the new technologies are incorporated into the teaching and learning process. ICT can enhance existing teaching methods or introduce fresh, more effective ones, which will ultimately affect how well students learn.

The active participation of students, such as with generic or particular software, is a third key aspect of ICT use in the classroom. According to the evidence, teachers typically do not fully utilize the creative potential of ICT, such as by having students participate more actively in the creation of knowledge. A higher level of critical digital abilities among students, however, has a favourable impact on their learning results. There is evidence that digitally supportive teachers tend to have more technologically aware pupils (Argentin, 2013).

The knowledge economy is the driving force behind the Information and Communication Technology era. In order to keep up with the trend, the education system is motivated to invest significantly in teaching and learning methodologies by implementing the CAI. More specifically, there has been research on how ICTs might assist teaching techniques in order to improve student enthusiasm for learning and assess the effect on academic accomplishment. Based on research on ICT use in social science disciplines, including Economics, the results show that there are both direct and indirect effects of ICTs on learning depending on students' and teachers' characteristics (Mbaeze et al., 2010).

Based on a number of studies, Ben-Youssef and Dahmani (2010) claim that the impacts of ICT on students' academic performance have been inconsistent. After accounting for student characteristics and bias, Coates and Humphreys (2004) compared the utilization of the face-to-face style of teaching with the online teaching of economics. According to the report, pupils who took the traditional technique class scored 15% better than those who took the online session. Additionally, Terry (2003) found no indication of a connection between greater educational ICT use and students' academic performance when comparing three different teaching methods: online, on-campus, and hybrid. In reality, they discovered that various student achievement metrics and ICT use had a continuously unfavourable and very slightly significant connection.

In addition, students in a match-pair of an online and in-person course on the fundamentals of economics given by the same instructor were polled by Brown and Liedholm (2012). They claimed that after accounting for differences in student characteristics, exam scores for the on-campus version were about 6% higher than for the online model. They explain the relatively higher-class performance of the on-campus students by the advantages of face-to-face interactions between the teacher and students, and they explain the relatively lower-class performance of the online students by the lack of self-discipline required for successful independent learning in the online environment. According to Kulik (2014), who used a meta-analysis study, students who received computer-based instruction on average outperformed students without computers in terms of test scores, with the added benefit of being able to learn more material in less time and enjoying their classes more.

First of all, non-linear information presentation is a feature of web-based training, claim Li, LeBoeuf, Basu, and Turner (2013), allowing students to explore new material through browsing and cross-referencing activities. Second, web-based instruction promotes the constructivist theory's emphasis on active learning. Thirdly, better visualization and finally the flexibility of accessing material whenever and whenever are two ways that online education improves understanding. International data from the Programme for International Student Assessment (PISA) was used by Fuchs and Woessman in 2004. They demonstrate that whereas the bivariate correlation between students' performance and the availability of ICTs is highly and significantly favourable, the connection decreases and becomes unimportant when other aspects of the student environment are taken into account. According to them, the appropriate use of digital technologies in higher education, which can have significant positive effects both on students' attitudes and achievement, the analysis of the effects of these methodological and technological innovations on students' attitudes toward the learning process and on students' performance appears to be moving toward consensus.

Additionally, a database of 67 introductory economics sections given by 30 instructors at 15 universities across the United States of America during the spring and autumn semesters of 2002, enrolling 3,986 students, was created by Sosin, Blecha, Agrawal, Bartlett, and Daniel (2004). Due to the usage of ICT, they discovered a significant yet modest improvement in student performance. However, they demonstrate that while certain ICT appears to be positively connected to performance, others do not. According to research by Anyamene, Nwokolo, Anyachebelu, and Anemelu (2012), Paul and Babaworo (2006), Karper, Robinson, and Casado-Kehoe (2005) on the impact of computer-assisted packages on senior secondary students' performance in mathematics, chemistry, geography, and counselling education, respectively, students taught using CAI packages outperformed the control group in retention tests. However, although some of the research showed that using ICT considerably enhances students' performance in the relevant subject areas, some showed the opposite.

For instance, ICT as a teaching tool has the potential to improve learning outcomes in CRK if used by teachers during the learning process, according to research on its use in CRK instruction. The majority of researchers discovered that CRK has a sizable impact on academic achievement, and there were no contrary findings. The influence on standards was greater in classrooms where students had regular access to the necessary equipment. When students used ICT effectively, their work was presented better, they had access to a wider range of information, and they were better able to imagine themselves in other people's shoes (for example, by taking virtual field trips or reading about other people's struggles), and they understood and analysed key concepts better.

**Methodology**

The descriptive survey design was adopted for the study to investigate the relationship between the independent variable information and communication technology use skills and the dependent variable academic performance. The population of the study was 500 selected from 4 schools using a simple random and convenience sampling technique was adopted to pick a fraction of 50% of the population. This, therefore, gave a total of 250 respondents.

Questionnaire was used for data collection. The Questionnaire was titled “ICT Use Questionnaire it contained and is scaled using the Likert scale format. Equally, the second instrument is an achievement test. It contained 25 questions, and it is used to test the level of mathematics assimilation among the students. To ensure the reliability of the instrument, thirty copies of the questionnaire were administered to the senior secondary school II (SS2) students in Chancery College, Ibadan which is outside the study population. The Cronbach Alpha reliability coefficients of the scales are as follows: ICT tools (α=.737), ICT use skills (α=.73), and training platforms (α=.751). The copies of 250 questionnaires were administered but 242 copies were retrieved, coded and analysed. The data was collated and analysed using descriptive statistics such as frequency counts and percentages for research questions 1-4 while the Spearman Rank correlation coefficient was used for research question 5. The statistical package for the social sciences (SPSS) was used for computing and analysing the data generated from the study.

**Results**

The result of data analysis shows that 16.5% of the respondents are from God’s Blessing Comprehensive College, 8.3% are from Maverick College, 36.4% are from Abadina College while 38.8% are from Ikolaba Grammar School. Table 2 presents the frequencies of the respondents’ gender in the schools sampled. It is shown that more female views 140 (57.9%) than male views 102(42.1%) are represented in this study. This is because there were, perhaps more females than males in some of the schools used for this study.

**Table 1: Research Question One: what are the ICT gadgets and tools used in your school?**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S/NO | ICT gadgets for mathematics | VHU | HU | FU | NU | Remarks |
| 1 | Scientific Calculators | 163(67.4%) | 56(23.1%) | 20(8.3%) | 3(1.2%) | VHU |
| 2 | Internet | 63(26.0) | 79(32.6) | 48(19.8%) | 52(21.5%) | HU |
| 3 | Electronic calculator | 61(25.2%) | 46(19.0) | 52(21.5%) | 83(34.3) | NU |
| 4 | Laptops | 61(25.2%) | 46(19.0%) | 40(16.5%) | 95(39.3%) | NU |
| 5 | Spreadsheet software like Microsoft Excel, Calc | 68(28.1%) | 61(25.2%) | 48(19.8%) | 65(26.9%) | VHU |
| 6 | Data collection tools like data science | 84(34.7%) | 48(19.8%) | 41(16.9%) | 69(28.5%) | VHU |
| 7 | Computers | 127(52.5%) | 58(24.0%) | 30(12.4%) | 27(11.2%) | VHU |
| 8 | Graphics calculator | 51(21.1%) | 38(15.7%) | 53(21.9%) | 100(41.3%) | NU |
| 9 | Computerized graphing | 54(22.3%) | 36(14.9%) | 45(18.6%) | 107(44.2%) | NU |
| 10 | Smartphones | 85(35.1%) | 39(16.1%) | 44(18.2%) | 74(30.6%) | VHU |

Table 1 shows the ICT gadgets and tools used by the students in selected senior secondary schools in Ibadan. From Table 3, 163(67.4%) of the respondents indicated that scientific calculators are very highly used in their school; 79(32.6%) of the respondents highly used the internet in their schools; 68(28.1%) of the respondents indicated that spreadsheets are very highly used in their schools; 84(34.7%) of the respondents indicated that data collection tools are very highly used in their schools; 127(52.5%) of the respondents indicated that computers are very highly used in their school; 85(35.1%) indicated that smartphones are very highly used in their school.

Also, from Table 1, 83(34.3%) of the respondents indicated that electronic calculators are not used in their school; 95(39.3%) of the respondents indicated that laptops are not used in their school; 100(41.3%) of the respondents indicated that graphics calculators are not used in their school; 107(44.2%) of the respondents indicated that computerized graphing is not used in their school. From the information presented above, inference can be drawn that the ICT gadget and tools used by students in senior secondary schools include Scientific calculators, the Internet, spreadsheets, data collection tools, computers and smartphones.

**Table 2: What types of ICT use skills are possessed by the students?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SN | ICT skills possessed by students | SA | A | D | SD |
| 1 | I can use the calculator on the computer and know how it functions | 101  (41.7%) | 90  (37.2%) | 32  (13.2%) | 19  (7.9%) |
| 2 | I can use specific mathematical software | 64  (26.4%) | 88  (36.4%) | 56  (23.1%) | 34  (14.0%) |
| 3 | I can use a Scientific calculator | 152  (62.8%) | 76  (31.4%) | 9  (3.7%) | 5  (2.1%) |
| 4 | I can carry out searches about mathematics on the internet | 93  (38.4%) | 88  (36.4%) | 37  (15.3%) | 24  (9.9%) |
| 5 | I can access mathematical databases/sites on the internet | 77  (31.8%) | 86 (35.5%) | 54 (22.3%) | 25  (10.3%) |
| 6 | I can access past questions about mathematics on Google | 119  (49.2%) | 88  (36.4%) | 23  (9.5%) | 12  (5.0%) |
| 7 | I can plot graphs, and create charts using Excel sheet packages | 79  (32.6%) | 77  (31.8%) | 62  (25.6%) | 24  (9.9%) |
| 8 | I can download and save documents on mathematics | 89(36.8%) | 73(30.2%) | 58(24.0%) | 22(9.1%) |
| 9 | I can effectively use the internet to get more formulas when preparing for my upcoming examination | 92  (38.0%) | 89  (36.8%) | 41  (16.9%) | 20  (8.3%) |
| 10 | I can use the internet to get mathematical formulas about the assignment I was given in school | 96  (39.7%) | 99 (40.9%) | 33 (13.6%) | 14 (5.8%) |
| 11 | I can locate any information I need on Mathematics on the internet | 90(37.2%) | 87(36.0%) | 46(19.0%) | 19(7.9%) |
| 12 | I love using scientific calculators more than an electronic calculator | 152(62.8%) | 66(27.3%) | 12(5.0%) | 12(5.0%) |

Table 2 shows that the students indicated high ICT skills as it relates to academic purposes. The majority ‘strongly agreed’ and ‘agreed’ to all the items measuring this scale. The majority 101(41.7%) and 90 (37.2%) of the respondents strongly agreed and agreed respectively that they can use the calculator on the computer and know how it functions; 88(36.4%) and 64(26.4%) of the respondents agreed and strongly agreed respectively that they can use specific mathematical software; 152(62.8%) and 76(31.4%) of the respondents strongly agreed and agreed respectively that they can use a scientific calculator; 93(38.4%) and 88(36.4%) of the respondents strongly agreed and agreed respectively that they can carry out searches about mathematics on the internet; 86(35.5%) and 77(31.8%) of the respondents agreed and strongly agreed respectively that they can access mathematical databases on the internet; 119(49.2%) and 88(36.4%) of the respondents strongly agreed and agreed respectively that they can access past questions about mathematics on Google.

In addition, Table 2 showed that 79(32.6%) and 77(31.8%) of the respondents strongly agreed and agreed respectively that they can plot graphs, and create charts using Excel sheet packages; 89(36.8%) and 73(30.2%) of the respondents strongly agreed and agreed respectively that they can download and save documents on mathematics; 92(38.0%) and 89(36.8%) of the respondents strongly agreed and agreed respectively that they can effectively use internet to get more formulas when preparing for their upcoming examination; 99(40.9%) and 96(39.7%) of the respondents agreed and strongly agreed that they can use internet to get mathematical formulas about the assignment give in school; 90(37.2%) and 87(36.0%) of the respondents strongly agreed and agreed respectively that they can locate any information they need about mathematics on the internet; 152(62.8%) and 66(27.3%) of the respondents strongly agreed and agreed that they love using scientific calculator to electronic calculator.

From the information presented above, it can be described that the ICT skills possessed by the students include: using calculator on the computer and knowing how it functions, using specific mathematical software, carrying out searches on the internet, using a scientific calculator, accessing mathematical databases on the internet, accessing past questions about mathematics on Google, plotting graphs and drawing charts using excel packages, downloading and saving documents on mathematics, effectively using internet to get more formulas when preparing for examination and doing assignments, locating information about mathematics on internet and using scientific calculator judiciously.

**Table 3: ICT training organized by the school**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Training Platform** | **YES** | **NO** | **REMARKS** |
| 1 | My school organises training on ICT use in the school computer laboratory | 176(72.7%) | 66(27.3%) | YES |
| 2 | My school organises internet search skills training | 119(49.2%) | 122(50.8%) | NO |
| 3 | My teacher uses a computer to teach us in class | 83(34.3%) | 159(65.7%) | NO |
| 4 | My school organises seminars on ICT skills acquisition | 99(39.9%) | 143(59.1%) | NO |
| 5 | My school offers data processing as a subject | 200(82.6%) | 41(16.9%) | YES |
| 6 | My school offers Computer science as a core subject | 161(66.5%) | 79(33.5%) | YES |
| 7 | My teacher uses online videos to teach us | 51(21.1%) | 191(78.9%) | N0 |
| 8 | My school organises computer training for students. | 132(54.5%) | 110(45.5%) | YES |

Table 3 shows that 176(72.7%) of the respondents affirmed that their school organizes training on ICT use in the school computer laboratory; 122(50.8%) of the respondents indicated that their school does not organize internet search skills training; 159(65.7%) of the respondents indicated that their teachers do not use computers to teach them in class; 143(59.1%) of the respondents indicated that their school does not organize a seminar on ICT skills acquisition; 200(82.6%) of the respondents indicated that their school offers data processing as a subject; 161(66.5%) of the respondents indicated that their school offers computer as a core subject; 191(78.9%) 0f the respondents indicated that their teacher does not use online videos to teach them; 132(54.5%) of the respondents indicated that their school organizes computer training for students. From the information presented above, inference can be drawn that the training platforms that are available in the schools sampled are: training on ICT use in the school computer laboratory, offering of data processing and computer as a core subject and computer training for students.

**Table 4: Correlation between ICT skills and students' test scores**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | ICT\_skill\_set | TEST\_SCORE |
| Spearman's rho | ICT\_skill\_set | Correlation Coefficient | 1 | -.141\* |
| Sig. (2-tailed) | . | 0.029 |
| N | 242 | 242 |
| \* Correlation is significant at the 0.05 level (2-tailed). | | | | |

Spearman rank correlation was used to determine the relationship between ICT skills and students' test scores. Table 4 illustrates how the statistical relationship between ICT skills and the student's test scores. To answer research question 5, the scores from the responses of the students on ICT skills were correlated with their test scores. The results in Table 4 showed that the correlation coefficient is –0.141. This means that there exists a negative relationship between ICT skills and achievement in mathematics among students in selected secondary schools in Ibadan. The information above, this show that ICT use skill does not influence the mathematics achievement of students in the selected schools.

**Discussion of Findings**

The result of the study shows that the ICT gadget and tools used by students in senior secondary schools include scientific calculators, the Internet, spreadsheets, data collection tools, computers and smartphones. It was revealed that other gadgets and tools like electronic calculators, laptops, graphics calculators, and computerized graphing were not used in the schools. This may be due to a lack of funds or lack of know-how among the staff in the schools.

ICT in schools might take the form of computers, internet access, audio-visual equipment, multimedia projectors, etc. Many educational institutions now have computers and internet access. ICT is expected to play a significant role in teaching and learning across all educational institutions, according to educators. Through the global exchange of ideas and experiences as well as access to a broad variety of information sources, including books, periodicals, newspapers, and many others, the usage of the internet can assist students in creating their understanding of their subjects and being completely in control of them. Today's classroom technology includes everything from straightforward tool-based programs (like word processors) to internet databases of scientific data. Primary historical records, portable computers, closed-circuit television channels, and two-way distance learning classrooms are some more resources. Students can learn via computers, which act as virtual tutors and help them gain more foundational knowledge and abilities.

Result of the study shows that the students have some skills they possess in order to enhance their academic achievement. However, these skills are essential in their academic pursuits and will help them perform better academically. The ICT skills possessed by the students include: using the calculator on the computer and knowing how it functions, using specific mathematical software, carrying out searches on the internet, using a scientific calculator, accessing mathematical databases on the internet, accessing past questions about mathematics on Google, plotting graphs and drawing charts using excel packages, downloading and saving documents on mathematics, effectively using the internet to get more formulas when preparing for examination and doing assignments, locating information about mathematics on the internet and using scientific calculator judiciously.

Also, respondents emphasize that they use the internet to get more formulas when preparing for an examination. Nonetheless, they stressed the need to use the scientific calculator because it is easier to use and saves time and it also serves as an alternative means to the electronic calculator. From the results of the findings, inference can be drawn that the training platforms that are available in the schools sampled are: training on ICT use in the school computer laboratory, offering of data processing and computer as a core subject and computer training for students. Although in my interaction with some of the respondents, they said they have computers in their school but they only use them when they have data processing or computer classes. However, the researchers observed that most of the teachers in the schools sampled can’t operate a computer effectively so this factor also can be a stumbling factor to the usage of ICT gadgets and tools by the students.

The study also shows that ICT is used quite often in secondary schools. Also, the type of ICT gadgets and tools used vary as well as the frequency of usage differs from one school to another. Based on the findings of the study, the respondents can browse on their own, they use the internet to do their assignments and prepare for upcoming examinations like WAEC and they use the internet to get any information they need. Though the schools sampled don’t use computers to teach them in class except for Computer and data processing classes, and the school do not use computers to administer their examination to students. Most of the schools sampled except Maverick College and God’s Blessing comprehensive college still use chalk to write on the board for the students while the latter schools use the whiteboard.

The result of the study in Table 4 shows that there exists a negative relationship between ICT skills and the academic performance of students. This means that ICT use skills do not influence the student’s achievement in mathematics in the selected secondary school. The outcomes are in line with According to Ben-Youssef and Dahmani (2010), there have been conflicting findings about the impact of ICT on pupils' academic performance. After accounting for the characteristics of the students and selection bias, Coates and Humphreys (2004) and Astin (1999) contrasted the utilization of the face-to-face style of teaching with the online teaching of economics. According to the report, pupils who took the traditional technique class scored 15% better than those who took the online session. Additionally, Terry, (2003) and Leuven, (2004) reported that there is no indication of a relationship between increased educational usage of ICT and students' academic performance when comparing three styles of teaching: online, on-campus, and hybrid approaches.

In reality, the researchers discovered that there is a consistently inverse and very marginally significant association between various student achievement metrics and ICT use. According to Cener, Acun, and Demirhan (2015), ICT has no impact on pupils' success levels. ICT and pupils' academic performance did not have a significant association, according to Mbaeze, Ukwandu, and Anudu (2010). This is in contrast to the results of an experimental study carried out by Carrillo, Onofa, and Ponce (2010) on the relationship between information technology and students' achievement, which found that ICT has a positive impact on math test scores but has no effect on language test scores. The use of ICT in teaching and learning, according to Ziden, Ismail, Spian, and Kumutha (2011), boosted students' achievement in science-related topics. Similar findings were reached by Safdar, Yousuf, Parveen, and Behlol (2011), who found that ICT improves students' achievement levels. Similar findings were reached by Okoro and Ekpo (2016), who found that students who were taught using ICT outperformed those who were taught using traditional instructional strategies.

**Conclusion**

From these findings, it is hereby concluded that Information Communication Technology (ICT) is of great importance in our secondary education but it does not improve the academic performance of students. Some students don’t have access to ICT yet they perform excellently in Internal and External examinations while some students who have access to ICT perform woefully in External examinations. Therefore, ICT should not be a yardstick to measure students’ academic achievement. Majority of the respondents possess ICT literacy skills but in marking the achievement test that was conducted by the researcher, it was revealed that ICT skills do not have anything to do with their achievement in mathematics.

**Recommendations**

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

1. Since my quantitative study concentrated on the relationship between ICT and student scores, a teacher survey was not introduced. Therefore, my recommendations are that a more in-depth study is warranted that would support the literature that depicts a possible lack of training for teachers in the implementation of effective technology use in the classroom. A teacher survey could also provide information on how teachers integrated (or not) technology into their teaching. It is possible that, although the technology was available in classrooms, it was not utilized effectively with students, and therefore, no change in grades was noted.
2. 2. An alternative research strategy might be used. Because it would be helpful to comprehend any inconsistencies between the quantitative data (given for this study) and qualitative conclusions (supplied by teachers), a case study with a mixed method approach, for instance, would have produced data that would explain the results. A teacher poll on ICT use and familiarity might have produced a more comprehensive set of data.
3. In the future, a more in-depth study measuring different variables with a larger sample size would help to determine a truer hypothesis because, with a larger sample size, it may be possible to reveal the true nature of the population. By using a larger sample size, it would be expected that the sample mean and the sample proportion would be closer to the population mean and proportion. A larger sample size would, therefore, provide more convincing evidence.
4. Due to the time constraint that limited the scope of this study, the researcher suggests that a longitudinal study that would employ quasi-experiment research design should be conducted to investigate the relationship between ICT skills and students’ achievement in mathematics. This would provide a more worthwhile finding of the influence ICT could have on performance. Also, the gender difference could be examined to ascertain the observation of various studies that males are more inclined to ICT usage and tend to perform better than their female counterparts.
5. Also, policymakers and curriculum planners should see to the inclusion of ICT usage on timetables beyond data processing and computer class.

**References**

Adesemowo, P. O. (2005). *Premium on affective education: panacea for scholastic malfunctioning and aberration*. Olabisi Onabanjo University Press

Adeyemi, T. O., & Bolarinwa, R. (2013). Principals’ leadership styles and student academic performance in secondary schools in Ekiti State, Nigeria. *International journal of academic research in progressive education and development*, *2*(1), 187-198.

Anyamene, A., Nwokolo, C., Anyachebelu, F., & Anemelu, V. C. (2012). Effect of computer-assisted packages on the performance of senior secondary students in mathematics in Awka, Anambra state, Nigeria. *American International Journal of Contemporary Research*, *2*(7), 61-65.

Argentin G., Gui M. & Tamanini C. (2013). A scuola di competenza digitale. Il ruolo degli insegnanti nell'uso delle ICT degli student. *Scuola Democratica (Il Mulino),* 1(1)

Baek, S. G., & Park, K. I. (2010). Analysis of the causal relationship among teacher-student relationship, academic achievement, and satisfaction for school education in the girl’s high school. *Journal of Educational Evaluation*, *23*, 281-98.

Bappah, M. (2010). Availability and use of information and communication technology (ICT) in six Nigerian university library schools. www.webpages.University Library Schools. www.webpages.uidaho.edu/~mbolin/bappah-abubakar.htm.

Ben Youssef, A., Dahmani, M., & Omrani, N. (2012). Students' e-skills, organizational change and diversity of learning process: Evidence from French universities in 2010. *ZEW-Centre for European Economic Research Discussion Paper*, (12-031).

Brown, B. W., & Liedholm, C. E. (2012). Can web courses replace the classroom in principles of microeconomics? *American Economic Review*, *92*(2), 444-448.

Coates, D., Humphreys, B. R., Kane, J., & Vachris, M. A. (2004). No significant distance between face-to-face and online instruction: Evidence from principles of economics. *Economics of Education Review*, *23*(5), 533-546.

Erdogdu, F. and Erdogdu, E., 2015. The impact of access to ICT, student background and school/home environment on the academic success of students in Turkey: An international comparative analysis. *Computers & Education*, *82*, pp.26-49.

European Commission (2013). *Survey of schools: ICT in education*. Brussels, Belgium.

Federal Ministry of Education (2010). *National policy on information technologies (ICT) in education.*

Federal Republic of Nigeria (2006). *Education sector report.* Federal Ministry of Education

Fuchs, T., & Woessman, L. (2004). Computers and student learning: Bivariate and multivariate evidence on the availability and use of computers at home and school, 1321. *November. Munich*.

Hussain, M., Iqbal, M., & Akhtar, M. (2010). Technology-based learning environment and student achievement in English as a foreign language in Pakistan. *Journal of World Academy of Science, Engineering, and Technology,* 61, 129-133.

Hemalatha, T.M. & Devi, C.K., ICT in education: A critical literature review and its implications. *Implementation of ICT Skills for the Students for their Employment in Skill Based Jobs*, *1*, p.139.

Isiaka, A. (2014*). The growth and development of western education in Oyo state, Nigeria: 1980-1998*. [M.Ed. Dissertation, University of Lagos].

Karper, C., Robinson, E. H., & Casado-Kehoe, M. (2005). Computer-assisted instruction and academic performance in counselor education. *Journal of Technology in Counseling*, *4*(1), 12-15.

Kulik, C. T. (2014). Working below and above the line: Theresearch–practice gap in diversity management. *Human Resource Management Journal*, *24*(2), 129-144.

Lavy, V. (2010). *Do differences in school instruction time explain international achievement gaps in math, science, and reading?: Evidence from developed and developing countries*. Cambridge, MA: National Bureau of Economic Research.

Li, Q., & Ma, X. (2010). A meta-analysis of the effects of computer technology in school students ‘mathematics learning. *Educational Psychology Review,* 22(3), 215-243.

Li, Y., LeBoeuf, E. J., Basu, P. K., & Turner, L. H. (2013). Development of a web‐based mass transfer processes laboratory: System development and implementation. *Computer Applications in Engineering Education,* 11(1), 25-39.

Luis, F. & Andres, F. (2011). Access to computers and Academic Achievement. Where is it best; At Home or at School: Department of Economics Universidad del Rosario. Bogota Colombia

Maina, M. (2010). *Strategies employed by secondary school principals to improve academic performance in Embu West District. Kenyatta* University. <http://irlibrary.ku.ac.ke/bitstream/handle/123456789/930/Mwaura%2C%20James%20Maina.pdf?sequence=3>

Mbaeze, I. C., Ukwandu, E., & Anudu, C. (2010). The influence of information and communication technologies on students’ academic performance. *Journal of Information Technology Impact*, *10*(3), 129-136.

Paul, S. Y., & Babaworo, S. (2006). Information and communication technologies (ICTs) in teacher education: The way forward. In *Proceeding of 19th Annual National Conference of Nigerian Association of Teachers of Technology (NAIT)*.

Sosin, K., Lecha, B. J., Agarwal, R., Bartlett, R. L., & Daniel, J. I. (2004). Efficiency in the use of technology in economic education: Some preliminary results. *American Economic Review*, *94*(2), 253-258.

Suleman, Q., Hussain, I., ud Din, M.N. & Shafique, F. (2017). Effects of information and communication technology (ICT) on students’ academic achievement and retention in chemistry at secondary level. *Journal of Education and Educational Development*, *4*(1).

Terry, N. L. (2003). The efficacy of alternative instruction modes in economics*. Journal of Economics and Economic Education Review*, 23-34.