Assessment of Computer Literacy Skills and their Utilization in the Teaching of Basic Science in Junior Secondary Schools in Imo State

Theresa Ucheoma. Ettu[1] --- Scholastica Ngozi Ezeribe[2] --- Leona Eucheria Ekechukwu[3] --- Julius Okechukwu Anyanwu[4] --- Lazarus Okoroji[5]

[1,2]National Open University of Nigeria, Learner Support Services Owerri Study Centre

[3]Department of Geology/ Geo-Physics, Federal University Ndufu- Alike Ikwo, Ebonyi State

[4]Department of Maritime Management Technology, School of Management Technology, Federal University of Technology, Owerri, Imo State, Nigeria

[5]Department of Transport Management Technology, School of Management Technology, Federal University of Technology, Owerri, Imo State, Nigeria

(Corresponding Author)

ABSTRACT

Computer resource has been widely seen as a sin-quo-non to teaching in various subjects world-wide. Prior to preliminary investigations of this, it was found out that the effect of computer utilization has not been properly felt in most junior secondary schools in Nigeria. This study investigated the possession and utilization of computer literacy skills by Basic Science teachers in Owerri Education Zone I & II of Imo State. The sample consists of 90 Basic Science teachers who were drawn from a population of 135 Basic Science teachers from the area of study: Proportionate random sampling technique was used to draw 90 teachers from 11 local government areas in the zones. Relevant data were collected from the sample using a questionnaire titled "Basic Science Teachers' Questionnaire on Computer Literacy Skills". Test and re-test method was used to find out reliability co-efficient within an interval of two weeks with 10 subjects who did not form part of the final samples. The four research questions posed were answered with mean and standard deviation while the four hypotheses formulated were tested with t-test of independent mean. The results of the analysis among other things showed that gender does not significantly influence literacy skills by the teachers. It also showed that school location significantly influenced the possession and utilization of computer literacy skills by the teachers. These results were discussed and one of the major recommendations was that government should organize in-service training programmes to up-date computer literacy skill of teachers and provide avenue for their utilization.

1. INTRODUCTION

1.1. Background to the Study

The use of computer is an integral part of science education. It aspires to play a major role in the transformation of a country into a knowledge based society. The introduction of computer in the teaching and learning of science subjects in secondary schools is very important. In 1990, National Council on Education (NCE) approved the recommendation of the national committee that was constituted in 1987 which led to the introduction of computer education in the Nigeria school system (Onyenedo and Habor –Peter, 2003). In page 2 of the 2013 National Policy on Education (NPE) in Nigeria on the specific goals 7f posits that it is to promote Information Technology capacity at all levels. It also states that the philosophy and goals of education in Nigeria is for education to be qualitative, comprehensive, functional and relevant to the needs of the society.

Computer has made a great impact worldwide and the Nigerian government is bent on using it to improve its educational system particularly in the teaching and learning of science subjects as the use of computer greatly improves teaching and learning. Akude (2004) opined that the ease with which computer applies itself as a resource in teaching and learning has made it an indispensable tool for effective teaching. In recognition of the vast advantages of the utilization of computer for national development, the government has endorsed its use in the educational system at all levels'. Thus the application of computer in school setting constitutes a major source of instructional materials. However, there have been a lot of constraints in the selection and utilization of computer based instructional materials in classroom teaching. He further posited that selection and utilization of appropriate instructional materials is not an easy task for the teachers because there is need to consider many factors before deciding on the type of instructional material to be used or the one not to be used. The teachers who are expected to decide the type of instructional materials ought to be equipped with skills. In any case Onyejemezi (1996) was opined that one of the reasons why many teachers in schools and colleges do not use some available instructional media is that they lack the necessary skills to operate them. Lack of skills in operating available instructional media is traced to the fact that most junior secondary school teacher were not properly exposed to these instructional media during their pre-service training programmes and are not adequate for the integration of technologies in classroom lessons. Considering the position of Basic Science as one of the core-subjects in junior secondary schools, there is needed to ask whether Basic Science teachers in junior secondary school possess adequate skills for integrating computer in their teaching. Basic Science is the foundation subject for all science subjects that are taught in senior secondary schools. As a result of this, learner competency on the subject is a prerequisite for better performance on the science subjects in senior secondary schools.In Basic Science teaching, computer can be used for simulation, drill and practice, tutorial and so many other activities. Thus there is need for Basic science teachers in junior secondary school to be aware of the uses of computer as it will assist them in achieving their teaching objectives. On this premise, the study is to investigate computer literacy skills possessed by Basic science teachers in Owerri Education Zone I and II.

1.2. Statement of the Problem

The world's system of education is going digital. A lot of information are sourced from the web/internet, in the classroom setting with the use of interactive board and other computing facilities. Computer indeed is a

very useful instructional media. Computer literacy is the ability to understand and use computers. Its usefulness and applicability in a teaching learning situation however depends on the ability of the teacher to operate it effectively. In Nigeria, previous studies by Olusegun (2015) and Yusuf (1998) showed that great percentages of teachers are not computer literate; most Basic Science teachers in the nation's school system are computer illiterate. How then can these teachers impact knowledge effectively on these students because their lack of skill and the utilization of computer in the teaching and learning of science are believed to be one of the factors responsible for the persistent poor performance of students in science subjects. The above observations have motivated the researchers to carry out this research work.

2. RESEARCH QUESTIONS

The study poses the following research questions to help in directing the course of the study.

1   To what extent do the level of Basic Science teacher's possession of computer literacy skills?

2   To what extent do Basic Science teachers utilize their computer literacy skills in teaching their subjects?

3   To what extent does school location influence Basic Science teachers possession of computer literacy skills?

4   To what extent does school location influence Basic Science teachers utilization of computer literacy skills?

3. HYPOTHESES

The following hypotheses have been formulated to guide the researcher HO_1 Gender does not significantly influence Basic Science teachers possession of computer literacy skills.

HO_2 Gender does not significantly influence Basic Science teachers' utilization of computer literacy skills. HO_3 School location (urban and rural) does not significantly influence Basic Science teachers' possession of computer literacy skills. HO_4 School location (urban and rural) does not significantly influence Basic Science teachers' utilization of computer literacy skills.

3.1. Purpose of the Study

The purpose of this study is to find out computer literacy skills possessed by Basic science teachers in public junior secondary schools in Owerri Education Zone I and II of Imo State. In specific terms, the purpose of this study includes.

1   To find out the extent to which Basic Science teachers possess the computer literacy skills

2   To find out the extent to which Basic Science teachers (male and female) utilize their computer literacy skills in teaching their lessons.

3   To find out the extent of the influence of school location on Basic science teachers possession of computer literacy skills.

4   To determine the influence of school location on Basic science teachers utilization of computer literacy skills.

4. REVIEW OF RELATED LITERATURE

4.1. Conceptual Framework

- **Computer Literacy Skills**

A computer literacy skill is an ability to understand and handle properly to get good result in whatever one is using the computer for. Computer literacy skills are the skills that allow an individual to understand and use computers well. They are acquired through learning. This study will look into some of the listed skills that are needed by Basic Science teachers.

The following skills are to be investigated

- Handling of mouse
- Using of fax machines.
- Saving file to flash or to a specific network environment.
- Navigating the internet using fundamental keys like, back forward reload, stop.
- Underling and bolding text
- Using the scanner.
- Use of arrow keys.
- Printing of document
- Copying a text from one file to another.
- Typing with keyboard of printing of document.

According to Tech Trends (2008) computer tutorials have their roots in programmed instruction (PI). This instructional technique is based on B.F skinner's behaviourism theory and teaching machines concept that was established in 1954. During skinner's presentation entitled "the science of learning and the art of teaching" he demonstrated a machine that was intended to teach spelling and maths. By the 1960's programmed instruction teaching machines engulfed the field, engendering a shift in paradigm. Computer tutorial began at the time that programmed instruction was at its peak. In Computer Assisted Instruction (CAI) students interact directly with computer as a part of the instructional activity. This may be in the form of materials presented by the computer in a controlled sequence, such as a drill- and –practice program or as a student –initiated creative activity, like a desktop published book of student poems. It uses the computer as a self-contained teaching machine to present discrete lessons to achieve specific but limited educational objectives. There are several CAI modes, they include: Drill and practice, tutorial, simulations and games and problem solving. PLATO an acronym for Programmed Logic for Automatic Teaching Operation is a form of Computer Assisted Instruction (CAI). In 1960, a research group at the University of Illinois began producing instruction using networked computer terminals. Donald Bitzer, known as the father of PLATO focused his team's efforts on developing a computerized learning system with which students could complete instructional modules at their own pace. The goal was to develop a technological solution to deliver individualized instruction in thousands of subjects. Simulation: A simulation is an abstraction or simplification of some real-life situation or process. In simulations, participants usually play a role that involves them in interactions with other people or with elements of the simulated environment. A business management simulation might put participants into the role of manager of a mythical corporation, provide them with statistics about business conditions, and direct them to negotiate a new labour contract with the union bargaining team.

Simulations can vary greatly in the extent to which they fully reflect the realities of the situation they are intended to model. A simulation that incorporates too many details of a complex situation might be too complicated and time consuming for the intended audience. On the other hand, if the model is oversimplified, it may fail completely to communicate its intended point. A well-designed simulation provides a faithful model of elements that are most salient to the immediate objective and its informs the instructor and participants about elements that have been simplified or eliminated. Simulations are by design active. They are not a "spectator sport". Simulations provide realistic practice with feedback in a realistic context. Most simulations include social interaction. One type of simulation, role play provides relatively open-ended social interaction between and among individual. However, there are some simulations, such as flight simulators in which there is no social interaction. Team simulations allow student to use their individual differences. Some computer-based simulations adjust their difficulty level based on the ability of the "player". Newell and Simon's logic theory was described in 1956 by settler 1990. Their programme "solved by simulating human behaviour through a process of heuristic search".

- **Teaching and Learning**

Basic science is one of the core subjects in Nigerian schools. It is the basic science and as a result, it is necessary that Basic science teachers should possess adequate computer literacy skills.

According to Yusuf (2007) computer can be used in teaching Basic science in the following ways

- It can help the teacher in lesson preparation.
- It can act as link between teachers, students and parents.
- It can be used in collecting, recording and analyzing attendance sheets.
- It can be used for storage of information as well as for disciplinary records.

It has been discovered through research that the teaching of Basic science is bedeviled with many problems such as

- Inadequate number of periods of teaching.
- Method of teaching that are used by teachers.
- Lack of adequate resources to teach the subject.

The potential uses of computers in educational settings go far beyond direct instruction. One function is administrative – keeping school records scheduling classes, doing payroll and managing students' assessment data.

Another is service oriented, as when guidance programs use computer to deliver career planning assistance.

In the domain of instruction, there are four broad classes of computer applications.

1. An object of instruction.
2. A tool.
3. An instructional device
4. A means of teaching logical thinking.

Within each of these categories, the role of the computer is varied and extensive.

1. Object of Instruction – The computer may itself be the object of instruction. For example, in computer literacy courses students learn about computers, and in vocational courses students learn to use computers on the job for data processing and analysis purposes. In this role, the computer is treated like any other machine one is learning to use.

When a learner is studying computer programming, the computer and the associated software (programs and applications) are the objects of instruction.

2. Tool – In its role as a tool, the computer assist both teachers and students. Some of the computers are relatively simple, such as a sophisticated calculator and typewriter. Others roles are more advanced, such as multimedia composer, presentation aid, communication device, and data retrieval source. Whatever the reason for using the computer as a tool, it has become indispensable. Traditionally, computers were used for reinforcing traditional instruction. The software was designed to provide direct instruction or practice to students, often programmed to branch to other segment of the lesson based on students' responses. Many of these types of programs are still in use today.

In an effort to recognize the constructive nature of learning, current methods are based on engaging students in learning in such ways that allow them to develop, or construct their own mental structure (schemata) in a particular area of study. To engage student in this type of learning, the environment must provide them with materials that allow them to explore. Papert's "Micro worlds" – environments that permit students to freely experiment, test, and invent. It allows students to focus on a problem area and to create solutions that are meaningful to them (Papert 1993). Many computer software packages are available to create such learning environment and assist students in constructing their schemata. Programs such as inspiration, a cognitive mapping program, facilitate the construction of concept maps, providing students with the means to relate the information to their lives and to alter those relationships as they continue to explore. Other programs such as hyperstudio permit students to develop files of data that are related in meaningful ways.

3. Instructional device – Computer Assisted Instruction (CAI) help students learn specific skills. For example Math Blaster Plus assists students in learning Math facts (addition, subtraction, multiplication and division) through drill- and- practice using an arcade game format with complex task to engage them in real – world problems. Programs such as National Inspirer ask students to engage in activities related to geography. Video technologies can easily be incorporated, focusing attention on tangible examples. Word processing, graphics, and a host of computer software help students organize and communicate their ideas.

4.2. Teaching and Learning Environment

As a result of the important nature of the subject in junior secondary schools; government has set up programmes with the sole objective of achieving effective teaching and learning on the subject. The Federal government of Nigeria has made frantic efforts toward ICT development in the country.

- Development of a Comprehensive Science Technology Policy (2001).
- Development and Launching of the National Information Technology Policy (2001).
- Establishment of the Nation information Development Agency (NITDA) (2001).

Yusuf (1998) observed that introduction of computer education into the Nigeria secondary schools since 1998 has largely been unsuccessful as a result of teacher incompetence. Studies show that teachers' ability and willingness to use and integrate computer in their teaching is largely dependent on the professional development they receive (Davis 2003) and (Pearson 2003).

When several technologies (soft and hard) are Basic into a single environment to accomplish the goal of enhancing student learning, via adaptation, it is called adaptive environment. There are several well- known types of adaptive environments.

1. Adaptive hypermedia environment: Adaptive hypermedia environments or system (AHSs) combines hypertext and hypermedia, utilizes features of the learner in the model, and applies the learning method (LM) during adaptation or visible aspects of the system to the learner. (Brusilovsky 2001) distinguished between two different types of AHS. (i) adapting the presentation of content (that is different media formats or orderings) (ii) adapting the navigation or learning path, via direct guidance; hiding, reordering, or annotating links, or even disabling or removing links.

2. Adaptive Educational Hypermedia Environment: This is a particular type of AHS. The hyperspace of Adaptive educational hypermedia environmental is kept relatively small given its focus on a specific topic, consequently, the focus of the LM is entirely on the domain knowledge of the learner. AEHS consist of a document space, a learner model, observations, and an adaptive component. The document space belong to the hypermedia system and is enriched with associated information (e.g annotations, domain or knowledge graphs). The LM stores, describes and infers information, knowledge and preferences about a learner. Observations represent the information about the interaction between the learners and the AEHS and are used for updating the LM.

3. Collaborative learning Environment: An alternative approach to individualized learning is collaborative learning – that is, the notion that students, working together, can learn more than by themselves, especially when they bring complementary, rather than identical contributions to the joint enterprise. Collaboration is a process by which "individuals negotiate and share meanings relevant to the problem – solving task at hand"

- **Integration in Basic Science**

The idea of integration of computer in Basic science teaching and learning is very essential. Hypermedia can be developed and used on computers that are commonly found in schools. They are applied in all areas of the curriculum for any learning goals that are suited to individual or small group exploration of a body of information. Hypermedia programs are available as off –the- shelf courseware and teachers can create them to fit unique local needs.

According to Heinich, Molenda, Russell and Smaldino (2002) ready-made hypermedia instructional courseware is becoming available for teachers to use in their classrooms. Many titles have been developed for use in all areas of study. Eg. Digestion is designed to be used by secondary school science students with complex and accurate diagrams. Students can learn about the process of digestion. This programme is available as a complete package. You do not have to do anything to the software. However, you will need to consider how to best introduce the application into the curriculum and what types of follow up are appropriate.

Teachers can either adapt existing materials or create new materials to fill a need of their own students. This is so because hypermedia software eg. Hyper studio provides an easy-to-use authoring language which some teachers have learned to successfully use in developing their own hypermedia materials. Since hypermedia material' are so easy to develop, it can shift the role of teachers in the classroom.

4.3. Computer Literacy Aspects for Teaching and Learning

Computer literacy is defined as the ability to tell a computer what you want it to do to achieve a desired goal. This implies that computer literacy is associated with the awareness of the system. In Basic science education, computer can facilitate easy explanation of some concepts. There is the need for Basic science teachers to be aware of possible skills of computer as it assist them in achieving better results.

For Basic Science teachers to utilize computer properly, they need to be computer literate having adequate computer skills to function effectively in their services. Computer is an indispensable tool or an instructional resource for educators in the achievement of learning objectives. Teachers are faced with the challenges of learning styles of the learners and this is to be considered in individualized instruction. Individualized instruction does not mean that the teacher teaches a child at a go rather it means that instructional procedure is aimed at meeting the needs, interest and ability of every learner. Individualized instruction provide a wide variety to accommodate multi-sensory approach to ensure that every learner achieve mastery. Every learner progresses at his own pace and the performance of each is compared to the criterion of mastery that is why individualized instruction is criterion reference not norm –reference. Efebo (1999) adds that individualized instruction offers a wide range of choices to students.

- Objectives of learning
- Rate of learning
- Method of Learning
- Content.

If in a particular instruction choice exist in all the above four dimensions, we say that instruction is fully individualized. It is characterized with rigidity as students must carefully go through and master the course content. The teacher prescribes the content and is always around to guide, direct, explain and supervise what the students are doing. Becta (2004) identified five reasons why teachers have no access to computer as

1. Lack of computer and facilities.
2. Over population of the classrooms.
3. Time schedule for its teaching in schools
4. Lack of knowledge on how to integrate computer.
5. Lack of services to support teachers.

4.4. Empirical Frameworks

4.4.1. Empirical Research Findings on the Level of Computer Literacy Skills Possessed by Teachers

Olusegun (2015) examined the teachers' and learners' ICT-readiness assessment for agricultural science instruction in secondary schools in Oyo State, Nigeria, the sample population of 30 and 600 agricultural science teachers and learners were randomly selected individually from 15 public and 15 private senior

secondary schools (SSS) in Ibadan North Local Government Area (LGA) of Oyo State, Nigeria. Descriptive survey design of ex post-facto type was espoused for the study. Findings revealed that teachers in private SSS were more ready to utilise ICT facilities for agricultural instruction than their colleagues in public SSS. Also, learners in private SSS were more prepared and ready for the utilisation of ICT facilities for agricultural science instruction. However, male and female learners in both private and public SSS were similarly ready for the ICT-facilities utilisation for agricultural science instruction thus there were no significant differences in their ICT-readiness. The study offered that, both male and female teachers and learners should be more ICT-compliant and always ready to upgrade their skills and knowledge in ICT-facilities, utilisation for agricultural science instruction and even for other school subjects particularly in Oyo State and generally in Nigeria.

This agrees with findings of Yusuf (1998) that teachers lack computer literacy skills. The time lag between 1998 Yusuf and 2015 by Olusegun studies should have made a lot of difference. The question therefore is what is the state of Nigerian secondary school teachers today regarding their computer literacy skills in the new pedagogical share?Basic science teaching in Nigeria junior secondary schools arose because of the need to lay foundation for science subjects in senior secondary schools and it is important for technological development in the county. Despite the important nature of the subject as one of the core subjects, there are problems that are associated with its teaching. Attempts have been made to solve these problems through researches and programmes that are geared towards effective teaching and learning of the subject.

5. METHODOLOGY

5.1. Research Design

This study is descriptive survey research which elicits information on the computer literacy skills possessed by Basic science school teachers in junior secondary schools in Owerri Education Zone I and II. According to Nworgu (1991) descriptive survey are those studies that aim at collecting data on, and describing them in systematic manner the characteristic features or facts about a given population. Descriptive survey is only interested in describing certain variables in relation to the population as well as how it is concerned with the description of event as they are. Ndaggi (1998) cited in Obioha (2006) explained that descriptive research is simply concerned with the collection of data for the purpose of describing and interpreting existing conditions, practices that are prevailing as well as on-going process and belief. He further stated that descriptive survey research involves the process of classification, analysis and measurement. It helps in discovering meaning of things or facts.

5.2. Variables of the Study

Computer literacy skills
Basic science teachers

5.3. Population of the Study

This study is being carried out with Basic Science teachers in public secondary schools in Owerri Education Zone I and II.

This zone consists of eleven (11) Local Government Areas namely:

Aboh Mbaise, Ahiazu Mbaise, Ezinihitte Mbaise, Ikeduru, Mbaitoli, Ngor Okpala, Oguta, Ihaji/Egbema, Owerri Municipal, Owerri North and Owerri West. Owerri municipal local Government area is an urban area while Owerri west and Owerri North are partly urbanized and partly rural. The remaining eight local Government Areas are rural in location. The zone is the largest and contains the capital of the state. It has a total of 156 public junior secondary schools and a total of 135 Basic science teachers. These reasons justify the choice of the area for the study as adequate sample size is assured.

Statistical data collected from Owerri zonal education board put the number of Basic science teachers in the zone at one hundred and thirty five (135). This number constitutes the population of the study. The number is for Basic science teacher serving in the zone in the year 2014/2015 academic session. The table below shows the spread of teachers in the various local Government areas that constitute the zone.

Table-3.1. Spread of Basic science teacher in the local Government areas in Owerri Education Zone I & II.

Local Government Area	Number of Teachers
Aboh Mbaise	13
Ahiazu Mbaise	9
Ezinihitte Mbaise	7
Ikeduru	10
Mbaitoli	16
Ngor Okpala	8
Oguta	5
Ihaji/Egbema	5
Owerri Municipal	23
Owerri North	25
Owerri West	14
Total: 11 Local Govt. Areas	135 teachers

2015 Statistics from the respective LGAs

5.4. Sample and Sampling Technique

The subject of this study will be 90 Basic science teachers that will be drawn from the eleven (11) local Government Areas in Owerri Education zone I & II of Imo State. These teachers are those currently serving in the public schools in the state.

The proportionate random technique was used in composing the study sample from the population. The researcher used proportionate random sampling technique in selecting 66.65% of teachers from the entire teachers in the zone. The two (2) local Government Areas with the highest number of teachers were chosen first with 11.11%, the other four (4) followed with 29.62% while the remaining five (5) with the least number of teachers were chosen last with 25.92%.

5.5. Instrument for Data Collection

Copies of a structured research development instrument called "Basic Science Teachers Questionnaire on Computer Literacy Skills (ISTQCLS) was used to collect relevant data for the study. The instrument consisted of four sessions.Section A collected background information on Basic science teachers which included gender, academic qualification, school location/L.G.A year of working experience.

Section B surveyed the extent to which Basic science teachers possess computer literacy skills.

Section C sought information on ways Basic science teachers utilize computer literacy skills.

Section D surveyed major factors that militate against effective utilization of computer literacy skills.

Items in section A are in free response pattern while those in sections B, C and D are in the pattern of a modified 4 point likert scale with the following options:

Strongly agree   SA

Agree   A

Disagree   D

Strongly disagree   SD

5.6. Validity and Reliability of the Instrument

The contributions and suggestions by experts were considered in the final validation of the instrument. They critically examined the items, made some inputs and gave suggestions that helped the researcher to modify the drafted instrument. The supervisor approved the instrument before its administration. All these were done to ensure validity of the instrument.

Test-retest method was adopted to determine the reliability of the designed instrument. The researcher field tested ten (10) copies of the questionnaire among ten Basic science teachers who were not form part of the final study group. Two weeks later, the same copies of questionnaire were re-administered on the same group of teachers. The scores of the respondents during the first and second administrations were correlated using Pearson Product Moment Correlation Coefficient. The reliability coefficient obtained was 0.80 and since this is more than half or .50 the instrument is deemed very reliable and therefore suitable for this study.

5.7. Method of Data Analysis

The research questions were answered with the mean and standard deviation test statistics while the hypotheses were tested with the t-test of independent mean statistics at the 0.5 level of significance.

Table-I. Extent of possession of computer literacy skills by Basic science teachers.

S/N	Items	$\overline{X}$	SD	Decision
1	I can type with keyboard.	2.98	1.72	accept
2	I can copy a text from one file to another.	2.93	1.71	Accept
3	I can use input devices like mouse and arrow keys.	1.90	1.37	Reject
4	I can print document from the computer.	2.73	1.67	Accept
5	I can use peripheral devices like scanner and digital camera.	1.40	1.18	Reject
6	I can draw a chart.	1.95	1.39	reject
7	I can navigate the internet using fundamental keys like back, forward, reload, stop.	1.23	1.11	reject
8	I can save file to flash.	2.74	1.65	Accept
9	I can bold a text.	2.73	1.65	Accept
10	I can use fax machine in sending letter.	1.36	1.16	reject
11	I can underline a text.	2.90	1.70	accept
12	I can handle the mouse.	2.18	1.47	reject

Source: Researchers' field survey

6. DATA PRESENTATION, ANALYSES AND RESULTS

6.1. Data Analysis

Research question one "What is the level of Basic science teachers possession of computer literacy skills?" This research question is answered with statistical mean and the result of the analysis is presented in table I.

Research Question 1

The result of this analysis on table I shows that mean scores of items 1,2, 4,8,9 and 11 exceeded criterion mean which is 2.50. These results therefore show that the computer literacy skills possessed by Basic science teacher are typing with keyboard, copying a text from one file to another, printing document, saving file to flash, bolding a text and underling a text only. The conclusion which can be drawn from this is that the computer literacy skills possessed by the teachers are still minimal or average.

Research Question 2

How do Basic science teachers utilize their computer literacy skills? This research question is answered with statistical mean and the results of the analysis are presented in table 2.

Table-2. How Basic science teachers utilize their computer literacy skills.

S/N	Items	X̄	SD	Decision
1	I use computer in keeping attendance of students.	2.20	1.48	reject
2	I use computer for instruction.	2.11	1.47	reject
3	I use computer for accessing students' performance in tests.	1.83	1.35	reject
4	I use computer to present information in small units.	1.63	1.27	reject
5	I use a number of graded examples on computer to explain concepts and principles learnt earlier.	1.46	1.21	reject
6	I use computer as inductive approach to teaching and learning.	1.50	1.22	reject
7	I engage learners to playing and spelling on the computer.	1.23	1.11	reject

Source: Researchers' field survey

The result of this analysis on table 2 shows that the scores of each of the 7 items are not equal to or greater than the criterion mean score of 2.50. The conclusion which can be drawn from these results is that Basic science teachers do not utilize computer literacy skills in teaching.

Research Question 3

What are the major factors that militate against effective utilization of computer literacy skills by the teachers? This research question is answered with statistical mean and the results of the analysis is presented in table 3.

The result of this analysis on table 3 shows that the mean scores of items 1,2,and 4 are equal to or greater than the criterion mean score of 2.50.

The conclusion which can be drawn from these results is that non-availability of computer in schools, non-availability of computer laboratories in schools and high cost of computer gadgets are the factors militating against effective utilization of computer literacy skills by the teachers.

Table-3. Factors that militate against effective utilization of computer literacy skills by the teachers.

S/N	Items	$\bar{X}$	SD	Decision
1	Non-availability of computer in schools is an impediment to effective utilization of computer literacy skills.	3.61	1.90	accept
2	Non-availability of computer laboratories in schools is factors that militate against effective utilization of computer literacy skills.	3.25	1.80	accept
3	Insecurity in schools is a hindrance to effective utilization of computer literacy skills.	2.06	1.43	reject
4	High cost of computer gadgets is factors that militate against effective utilization of computer literacy skills.	2.50	1.58	accept
5	Insufficient network is an impediment to effective utilization of computer literacy skills.	2.00	1.41	reject
6	Insufficient power supply is factors that militate against effective utilization of computer literacy skills.	2.00	1.41	reject
7	Non-availability of power supply is factors that militate against effective utilization of computer literacy skills.	1.23	1.11	reject

Source: Researchers' field survey

Research Question 4

What difference exists in the level of possession of computer literacy skills between the male and the female Basic science teachers? This research question is answered with statistical mean and the results of the analysis are presented in table 4.

Table-4. Gender difference in the possession of computer literacy skills by the teachers.

Variable	$\bar{X}$	SD	Decision
Male (21)	25.42	5.04	accept
Female (69)	27.56	5.25	accept

Source: Researchers' field survey

The result on table 4 shows that the mean scores of the males and females is 25.42 and 27.56 respectively. The slight higher mean score of the females shows that they possess higher levels of computer literacy skills than the males.

Research Question 5

How does gender influence Basic science teachers utilization of computer literacy skills? This research question is answered with statistical mean and the results of the analysis is presented in table 5.

Table-5. Influence of gender on utilization of computer literacy skills by the teachers.

Variable	$\bar{X}$	SD	Decision
Male (21)	12.00	3.46	accept
Female (69)	12.04	3.47	accept

Source: Researchers' field survey

The result on table 5 shows that the females mean score of 12.04 is very slightly higher than the 12.00 mean score of the males. The conclusion which can be drawn from this result is that gender exerts very slight difference in the utilization of computer literacy skills by the teachers.

Research Question 6

How does school location influence Basic science teachers possession of computer literacy skills? This research question is answered with statistical mean and the result of the analysis is presented in table 6.

Table-6. Influence of school location on possession of computer literacy skills by the teachers.

Variable	X̄	SD	Decision
Rural (60)	23.9	4.8	accept
Urban (30)	33.2	5.7	accept

Source: Researchers' field survey

The result shows that the urban schools mean score of 33.2 is higher than the rural schools mean score of 23.9.The meaning of this result is that school location exerts influence on the possession of computer literacy skills by the teachers.

Research Question 7

How does school location influence Basic science teachers utilization of computer literacy skills? This research question is answered with statistical mean and the result of the analysis is presented in table 7.

Table-7. Influence of school location on utilization of computer literacy skills by the teachers.

Variable	X̄	SD	Decision
Rural (60)	10.7	3.2	accept
Urban (30)	14.7	3.8	accept

Source: Researchers' field survey

The result of table 7 shows that the 14.7 mean score of urban schools is greater than the 10.7 mean score of rural schools. The conclusion drawn from this result is that school location exerts influence on the utilization of computer literacy skills by the teachers.

Hypothesis 1

Gender does not significantly influence Basic science teacher possession of computer literacy skills. This hypothesis is answered with t-test of independent variable and the result of the analysis is presented in table 8.

Table-8. t-test analysis of influence of gender on possession of computer literacy skills by the teachers.

Variable	X̄	SD	DF	t-cal	t-critical	Result
Male (21)	25.42	5.04	88	1.61	1.96	
Female (69)	27.56	5.25				Not Significant

Source: Researchers' field survey

The result on table 8 shows that the t-calculated value of 1.61 is lower than the t-critical value of 1.96 at 88 degree of freedom. Based on this result, the null hypothesis was retained. The conclusion therefore is that gender does not significantly influence the teachers possession of computer literacy skills.

Hypothesis 2

Gender does not significantly influence Basic science teachers utilization of computer literacy skills. This hypothesis is answered with t-test of independent variable and the result of the analysis is presented in table 9.

Table-9. t-test analysis of influence of gender on the teachers utilization of computer literacy skills by the teachers.

Variable	X	SD	DF	t-cal	t-cal	Result
Male (21)	12.00	3.46	88	0.05	1.96	
Female (69)	12.04	3.47				Not Significant

Source: Researchers' field survey

The result on table 9 shows that the t-calculated value of 0.05 is less than the t-critical value of 1.96 at 88 degree of freedom. This result led to the retention of the null hypothesis. The conclusion therefore is that gender of the teachers does not exert significant influence on their utilization of computer literacy skills.

Hypothesis 3

School location (urban and rural) does not significantly influence Basic Science teachers' possession of computer literacy skills. This hypothesis is answered with t-test of independent variable and the result of the analysis is presented in table 10.

Table-10. t-test analysis of influence of schools location on the teachers possession of computer literacy skills.

Variable	X̄	SD	DF	t-cal	t-critical	Result
Rural (60)	23.9	4.8	88	7.69	1.96	
Urban (30)	33.2	5.7				Significant

Source: Researchers' field survey

The result on table 10 shows that the t-calculated value of 7.69 is greater than the t-critical value of 1.96 at 88 degree of freedom. Based on this result, the null hypothesis was rejected and its alternative form accepted. The conclusion which can be drawn from this result is that school location exerts significant influence on the teachers' possession of computer literacy skills.

Hypothesis 4

School location (urban and rural) does not significantly influence Basic science teachers utilization of computer literacy skills. This hypothesis is answered with t-test of independent variable and the result of the analysis is presented in table 11.

Table-11. t-test analysis of influence of schools location on utilization of computer literacy skills by the teachers.

Variable	X̄	SD	DF	t-cal	t-critical	Result
Rural (60)	10.7	3.2	88	4.94	1.96	
Urban (30)	14.7	3.8				Significant

Source: Researchers' field survey

The result on table 11 shows that at 88 degree of freedom, the t-calculated value of 4.94 is greater than the t-critical value of 1.96. In the light of this result, the null hypothesis was rejected and its alternative form accepted. The conclusion is that schools location significantly influences the teachers utilization of computer literacy skills.

6.2. Discussion of the Result

What is the level of Basic science teachers possession of computer literacy skills?

The first research question sought to find out the level of Basic science teachers possession of computer literacy skills. The result of its mean of 2.50 and above shows that

Basic science teacher possess computer literacy skills on.

1. I can type with keyboard.
2. I can copy a text from one file to another.
3. I can print document from the computer.
4. I can save file to flash.
5. I can bold a text.
6. I can underline a text.

This is so because out of 12 computer literacy skills that were included in the questionnaire, it was only in the six skills listed above that the response of the respondents was up to 2.50. This finding supports the assertion of scholars (Kinzer Sherwood and Bransford 1986) that courses in computer literacy focus primarily on the history of computer, parts of computer and computer programming. These authors identified three additional aspects of computer literacy and they include knowledge of the benefit of computer, knowledge of the general effect of technology and appreciation of different level of understanding. According to them, Basic science teachers need computer literacy skills to function effectively in their services. This agrees with findings of Yusuf (1998) that teachers lack computer literacy skills.

How do Basic science teachers utilize their computer literacy skills in teaching their subjects?

This sought to find out how Basic science teachers utilize their computer literacy skills. The results of the mean of this research question shows that teachers do not utilize their computer literacy skills in teaching their subject. The result of this research question indicates the statement of Etukudo (2003) that most of our secondary schools do not seen to have ICT facilities and hence the teachers do not use them in the teaching /learning of science subjects. This seems to contribute to students' poor performance in WAEC/SSCE science examinations. Furthermore, the result also supports the assertion of Becta (2004) who identified five reasons why teachers have no access to computer as

1. Lack of knowledge and facilities.
2. Over population of the classroom.
3. Time schedule for the teaching in school.
4. Lack of knowledge on how to integrate computer.
5. Lack of services to support teachers.

The utilization of most instructional technologies like the computer in teaching-learning is wise but it often seem to be bogged by fleeting problems. The overwhelming negative response of the respondents to the

items that were meant to test this research question is an indication of the fact that Basic science teachers have a negative attitude towards utilization of computer literacy skills in teaching their subject.

The result justifies Onyejemezi (1991) that one of the reasons why many teachers in schools and colleges do not use some available instructional media is that they lack the necessary skills to operate them. Lack of skills in operating available instructional media is traced to the fact that most junior secondary schools teachers were not properly exposed to these instructional media during their pre-service training for the integration of technologies in classroom lessons.

What are the major factors that militate against effective utilization of computer literacy skills by the teachers?

The result of its mean of 2.50 shows that the underlisted factors militate against effective utilization of computer literacy skills.

1.   Non-availability of computer in schools is an impediment to effective utilization of computer literacy skills.
2.   Non-availability of computer laboratories in schools is a factor that militates against effective utilization of computer literacy skills.
3.   High cost of computer gadgets is factors that militate against effective utilization of computer literacy skills.

This is so because out of 7 factors that militate against effective utilization of computer literacy skills that were included in the questionnaire, it was in the three listed above that the response of the respondents was up to 2.50. This findings support the assertion of Olusegun (2015) that there are no computers in schools so as to provide access to ICT to both teachers and learners.

According to the author, there should be provision of computers in schools, building of computer laboratories as well as reduction in the price of computer gadgets.

What differences exist in the levels of possession of computer literacy skills between the male and female Basic science teachers?

The result of the mean scores of 25.42 for males and 27.57 for females shows that females possess more computer literacy skills than the males because of the slight higher mean score of the females from the males. This indicates that more females have interest in possession of computer literacy skills. It could be explained in term of lack of interest by the males as they think that teaching is meant for mainly females and they take it as a last resort.

How does gender influence Basic science teachers utilization of computer literacy skills?

The result of the mean scores of 12.04 for females and 12.00 for males show that there is slight difference in the utilization of computer literacy skills by the females than the males. This is so because females are more interested in teaching than males. As a result of this, they do not take teaching serious because they assume that it is meant for females.

How does school location influence Basic science teachers possession of computer literacy skills?

The result of the mean score of 33.2 for urban schools is higher than the means score of 23.9 for rural schools. This is an indication that urban school teachers have more opportunity for the acquisition of computer literacy skills than the rural school teachers.

Teachers in the urban schools have access to acquisition of computer literacy skills due to the developed nature and availability of basic amenities than those in the rural schools that lack basic amenities.

How does school location influence Basic science teachers utilization of computer literacy skills?

The result of the mean score of urban schools of 14.7 is greater than that of rural schools of 10.7. This result shows that school location influence utilization of computer literacy skills by teachers as those in urban schools utilize the skills more than those in the rural schools.

Gender does not significantly influence Basic science teachers possession of computer literacy skills.

Hypotheses one sought to find out influence of gender on possession of computer literacy skills by the teachers. The results of t-test of independent variable analysis of this hypotheses shows that at 0.05 level of significance and 88 degree of freedom, the t-calculated value of 1.61 was less than t-critical value of 1.96 as shown in table 8. This result indicates that there is no significant difference between mean score of responses of the male teachers and those of the female teachers.

Gender does not significantly influence Basic science teachers utilization of computer literacy skills.

In a related way hypothesis two sought to find out influence of gender on Basic science teachers utilization of computer literacy skills. The result of the t-test of independent variable analysis of this hypothesis shows that at 0.05 level of significance and 88 degree of freedom, the t-calculated value of 0.05 was less than t-critical value of 1.96 as shown in table 9. This result shows that there is no significant difference between mean score of responses of the female teachers and those of the male teachers.

School location (urban and rural) does not significantly influence Basic science teachers possession of computer literacy skills

The purpose of the third hypothesis was to find out influence of school location on the teachers possession of computer literacy skills. Statistical data of this analysis using t-test of independent mean as shown in table 10 shows that at 0.05 level of significance and 88 degree of freedom, the calculated t-value of 7.69 is higher than the t-critical value of 1.96 and this makes a significant difference. This result therefore shows that school location has significant influence on Basic science teachers possession of computer literacy skills. The result indicates that, Basic science teachers in the urban schools have more computer literacy skills than those in the rural schools.

School location (urban and rural) does not significantly influence Basic science teachers utilization of computer literacy skills.

Finally, the purpose of the fourth hypothesis was to find out influence of school location on utilization of computer literacy skills by the teachers. Statistical data of this analysis using t-test of independent mean as shown in table II shows that at 0.05 level of significance and 88 degree of freedom, the t-calculated value of 4.94 is higher than the t-critical value of 1.96. This result therefore shows that school location exerts significant influence on utilization of computer literacy skills by teachers. Possible reason for this significant difference in the utilization of computer literacy skills lie on the fact that urban schools have basic amenities like electricity which enhances utilization of the skills while rural schools lack basic amenities.

6.3. Conclusion

Based on the result of this study, the following conclusions were drawn.

i. The computer literacy skills possessed by Basic science teacher are on typing with keyboard, copying a text from one file to another, printing of document, saving file to flash, bolding a text and underlining a text only.

ii. Basic science teachers do not utilize their computer literacy skills in teaching the subject.

iii. Non-availability of computer in schools is a factor that militates against effective utilization of computer literacy skill in teaching the subject.

6.4. Recommendations

In the light of the result of the study, the following recommendations are hereby made.

i. The state government should organize in-services training on computer literacy for Basic science teachers in junior secondary schools.

ii. The government should provide computers in schools as well build computer laboratories where computers will be installed.

iii. Government should provide generators to schools for powering of the computer. This is necessary in view of the irregular power supply by the Power Holding Company of Nigeria (PHCN).

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