

Basic Computer Literacy and Level of Attainment of Secondary School Science Teachers in Delta State Capital Territory, Nigeria

Patrick Chukwuemeka Igbojinwaekwu^{1*}, Johnson Etaverho Maciver²

¹Department of science education Niger Delta University, wilberforce Island, Bayelsa State, Nigeria

²Department of Educational Foundations Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

*Corresponding author

Patrick Chukwuemeka
Igbojinwaekwu

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Abstract: This study investigated basic computer literacy and level of attainment of the secondary school science teachers in Delta State Capital Territory, Nigeria. The study adopted descriptive survey research design. The population of the study was 150(90 male and 60 female; 110 urban and 40 rural) science teachers from 15 secondary schools. The sample of the study was 135 (84 male and 51 female; 104 urban and 31 rural) science teachers. Seven research questions were posted. A valid and reliable instrument, basic computer literacy attainment level, was used to collect data. Mean was used to analyze the data. The results revealed that secondary school science teachers in Delta State Capital Territory have high basic computer competency level using national competency standard for computer knowledge as set up by Federal Republic of Nigeria as standard. Recommendations were given to stimulate sustainable high manpower training, of science teachers, in basic computer operations.

Keywords: Computer, Basic Computer Literacy, Secondary School Science Teachers, Level of Attainment.

INTRODUCTION

Computer is an electronic system that can be instructed to accept, process, store and present data and information; it is made up of two component parts, the hardware and software [1].

According to [2], computer as a machine and its associated equipment represent the hardware. It is, also, defined as all the physical parts of a computer like the system unit or central processing unit, mouse, keyboard, monitor, etc. Software is the programme containing instruction to the computer in a language that it can understand; this programme is developed by the programmers [2]. Simply put, software is the general term for a set of instructions that controls a computer or a communications network [1]. Software is held either on any storage device on the computer such as hard disk, CD-ROM (Compact Disk-Read Only Memory), DVD (Digital Versatile Disc) or on a diskette (Floppy disk). It is from the storage device that this set of instructions is loaded or copied into the computer's RAM (Random Access Memory), when needed.

The 21st century is regarded as the era of information and communication technology (ICT). Without the computers, there will be no ICT. Therefore, [3], opine that computers have become very essential tool for the effective implementations of all ICT programmes. According to [4], ICT is the convergence of computer networking and telecommunications to process, store, retrieve and send information of all kinds. [2] states that personal computers, in recent time,

have taken a central role in information sharing between individuals, both within and outside of organizations. Stressing on the importance of computer in ICT, [2] informs that a computer network is a form of computer configuration in which two or more computers are linked together to enable them share resources like data, peripheral devices (printers, disk drives or tapes) etc or to communicate with one another. Supporting the importance of computers in ICT realities [5] affirms that a network is formed when two or more computers are connected in a manner that facilitates information to pass from one to the other; this concept of inter-connecting groups of computer systems for the purpose of sharing information among people at different locations is called networking.

Basic computer literacy knows some basics in the operation of computer. For instance, if a science teacher knows how to on a computer, turn –off a computer, save a file, open a file, send mails and receive mails via a computer, he/she is said to possess the basic computer knowledge or literacy [6]. According to [7] in ICT competency standard for teachers (ICT-CST), the basic computer literacy needed by the teachers is, (i) basic knowledge of backup files, (ii) minimize and maximize and move windows, (iii)

check how much space is left on the drive or other storage devices, (iv) start up, log in, and shut down computer system properly, (v) download and install software on a hard disk, (vi) check for and install operating system updates, (vii) understanding basic computer hardware components and terminology and (viii) understand and manage the files.

In his view, defines basic computer literacy/ICT competency as knowledge skill and ability to efficiently select and utilize all sorts of electronic devices (computers, internet, mobile equipment and software resources) for the purpose of teaching and learning; it is the ability to manipulate the technology both in terms of hardware and applications[8].

Secondary school science teachers are those who teach science subjects at either junior or senior secondary school levels. He/she teaches either integrated or basic science, biology, chemistry or physics at the secondary school level. The least qualification of a science teacher in the Nigerian schools is the National certificate in education (NCE) in any of the aforementioned science subjects [9]. Most of these science teachers do not have the opportunity of undergoing a computer programme in course of their teacher education studies. Some were opportune to have it as a semester course in general studies (GST,) which is not adequate to give the teachers the required basic computer knowledge.

Opportunities abound everywhere for a computer illiterate person to become computer literate. Such places include centres for seminars and workshops for computer literacy programmes; universities and other schools established numerous ICT centres to train people on basic computer literacy/competency. The level of attainment of science teachers in Nigeria secondary schools in basic computer literacy/knowledge/competency is the ability of the science teachers to raise their standards in relation to Information and Communication Technology Competency Standards for Teachers (ICT-CST) [7] through which the Federal Government of Nigeria developed a national working document, National Competency Standard for Teachers (NCST) [9]. The implication is that, any teacher whose computer knowledge is below the NCST is said to incompetent in basic computer operations. The importance of computer in ICT world, in general and education in particular, cannot be over emphasized. Following the importance of computers in ICT industry, which by extension very important in education, one believes that science teachers in Nigeria secondary schools should have the basic computer knowledge or literacy to fit into the ICT world.

The contemporary students in Nigeria secondary schools are taught computer studies and data processing as a subject and a trade, respectively. So, the

quest by researchers to know how ready the science teachers are in this sensitive task vis-à-vis the NCST gave birth to this study. The statement of the problem is stated thus: What is the basic computer literacy attainment level of secondary school science teachers in Delta State Capital Territory of Nigeria?

RESEARCH QUESTIONS

The following seven research questions were formulated to guide this study.

1. What is the basic computer literacy attainment level of secondary school science teachers in Delta State Capital Territory, Nigeria?
2. What is the basic computer literacy attainment level of secondary school science teachers in urban area of Delta State Capital Territory, Nigeria?
3. What is the basic computer literacy attainment level of secondary school science teachers in rural area of Delta State Capital Territory, Nigeria?
4. What is the basic computer literacy attainment level of male secondary school science teachers in Delta State Capital Territory, Nigeria?
5. What is the basic computer literacy attainment level of female secondary school science teachers in Delta State Capital Territory, Nigeria?
6. What is the difference in basic computer literacy attainment level between male and female secondary school science teachers in Delta State Capital Territory, Nigeria?
7. What is the difference in basic computer literacy attainment level between urban and rural secondary school science teachers in Delta State Capital Territory, Nigeria?

MATERIALS AND METHODS

A descriptive survey research design was applied in this study. This design was chosen because the researchers wanted to inquire into the status quo of science teachers in terms of their computer literacy level of attainment, based on NCST.

The population of the study was 150 (90 male and 60 female; 110 urban and 40 rural) science teachers from 15 secondary schools in the Delta State Capital Territory. The sample of the study was 135 (84 male and 51 female; 104 urban and 31 rural) science teachers from 15 secondary schools (a science teacher from each school). The stratified random sampling technique was applied in the selection of 135 science teachers out of 150 science teachers from the 15 secondary schools in the Delta State Capital Territory.

The instrument for data collection, Basic Computer Literacy Attainment Level (BACOLAL), was researchers made. It consisted two sections, A and B. Section A sought for the bio-data of the science teachers, while section B contained eight items on basic computer literacy which the science teachers were meant to respond to. A 4-point Likert scale approach of Highly Literate (HL), Literate (L), Illiterate (I) and

Highly Illiterate (HI) of 4, 3, 2 and 1 point, respectively, was used in Section B of BACOLAL. Three science teachers, each from those who responded as being HL, L, I and HI, respectively, were randomly selected and subjected to basic computer knowledge operations with a life computer to authenticate their claims of responses in BACOLAL. The criterion mean (\bar{X}) of BACOLAL was 2.5.

The data collecting instrument, BACOLAL, was later subjected to content and face validities by three experts (A computer scientist, science educationist and test evaluator in Niger Delta University (NDU), Nigeria. The corrections and additions from these experts were included in the final draft of the BACOLAL. Cronbach Alpha was used to determine the

reliability index of BACOLAL, which was 0.87, and was judged to be good enough, Data collected from the respondents were analysed with mean statistics.

RESULTS AND DISCUSSION

The data collected with BACOLAL were analysed to provide answers to research questions 1-7.

Research question 1

What is the basic computer literacy attainment level of secondary school science teachers in Delta State Capital Territory, Nigeria?

Answer to research questions 1

The answer to research question 1 is as shown in table 1.

Table-1: Basic Computer Literacy Item Responses by Secondary School Science Teachers in Delta State Capital Territory, Nigeria

S/N	Basic Computer Literacy Item	HL	L	I	HI	\bar{X}	Decision
1.	Do you have knowledge of backup files?	80	21	24	10	3.3	HBCL*
2	Do you have knowledge of minimizing, maximizing and moving windows?	98	12	11	14	3.4	HBCL
3	Do you have the ability to check how much space left on a drive or other storage devices?	101	10	18	6	3.5	HBCL
4	Can you start-up, log-in and shut-down a computer system, properly?	105	11	13	6	3.6	HBCL
5	Can you download and install software on a hard disk?	23	42	30	40	2.4	DHBCL**
6	Can you check for and install operating system updates?	58	24	20	33	2.8	HBCL
7	Do you know the basic computer hardware and terminology?	64	29	31	11	3.1	HBCL
8	Do you understand and know how to manage files?	42	48	20	25	2.8	HBCL
Average Mean Respondents		71	24	21	18	3.1	HBCL

* Have Basic Computer Literacy

** Don't Have Basic Computer Literacy

From table 1, it is clear that the science teachers of secondary schools in Delta State Capital Territory, Nigeria, attended high literacy level in basic computer, since they made mean (\bar{X}) above criterion mean (\bar{X}) of 2.5 in all the basic computer literacy items, except in item 5 where they made a mean (\bar{X}) of 2.4 which is lower than 2.5. This agrees with the finding of [10] that teacher education students have basic competency knowledge of computers in Niger Delta University of Nigeria. This might have been so, probably because the science teachers might have been exposed to seminars/workshops in basic computer training and that the teacher education students might have had courses in basic knowledge of computer in course of their training programme in the university. In

general, the average mean (\bar{X}) of 3.1 in table 1, showed that secondary school science teachers in Delta State Capital Territory, Nigeria, had an appreciable level of basic computer literacy as in NSCT.

Research question 2

What is the basic computer literacy attainment level of secondary school science teachers in urban area in Delta State Capital Territory, Nigeria?

Answer to research question 2

The data in table 2 provide answer to research question 2. Basic Computer Literacy Item According to School Location.

Table-2: Responses of Secondary School Science Teachers to

S/ N	Basic Computer Literacy Item	Sch. Location	N	HL	L	I	HI	\bar{X}	Decision
1	Do you have knowledge of backup files?	Urban	101	55	19	20	10	3.1	HBCL*
		Rural	34	25	2	4	0	3.7	HBCL
2	Do you have knowledge of minimizing, maximizing and moving windows?	Urban	101	72	11	9	12	3.4	HBCL
		Rural	34	26	2	1	2	3.7	HBCL
3	Do you have the ability to check how much space left on a drive or other storage devices?	Urban	101	75	9	14	6	3.5	HBCL
		Rural	34	29	1	1	0	3.9	HBCL
4	Can you start-up, log-in and shut-down a computer system, properly?	Urban	101	83	9	8	4	3.6	HBCL
		Rural	34	22	2	5	2	3.4	HBCL
5	Can you download and install software on a hard disk?	Urban	101	24	39	28	13	2.7	HBCL
		Rural	34	8	3	2	18	2.0	DHBCL**
6	Can you check for and install operating system updates?	Urban	101	41	18	14	23	2.6	HBCL
		Rural	34	18	8	2	3	3.4	HBCL
7	Do you know the basic computer hardware and terminology?	Urban	101	46	21	26	11	3.0	HBCL
		Rural	34	19	8	4	0	3.5	HBCL
8	Do you understand and know how to manage files?	Urban	101	29	37	13	25	2.7	HBCL
		Rural	34	14	11	2	4	3.1	HBCL
Average Mean Responses		Urban	104	53	20	18	13	3.1	HBCL
		Rural	31	20	5	3	3	3.3	HBCL

* Have Basic Computer Literacy

** Don't Have Basic Computer Literacy

Data in table 2 showed that secondary school science teachers in urban area exhibited high basic computer literacy level in all basic computer literacy items in BACOLAL. This agrees with the findings of [2] that people in urban area are more literate in basic computer operations than those found in rural area. This might probably be due to easy access to computers and electricity by people in the urban areas.

The average mean of 3.2 of secondary school teaches in urban areas is an indication that they had attended an appreciable level of attainment in basic computer literacy and so, met the NCST.

Research question 3

What is the basic computer literacy attainment level of secondary school science teachers in rural areas in Delta State Capital Territory Nigeria?

Answer to research question 3

The answer to research question 3 is as shown in table 2. The finding in table 2 is that secondary school science teachers in the rural area showed high level attainment in basic computer literacy items in the BACOLAL, except in item 5 where they had mean (\bar{X}) of 2.0 which is lower than criterion mean (\bar{X}) of 2.5. This finding agrees with the finding of [10] that teacher education students in Niger Delta University, Nigeria, do not have basic knowledge of computer in

downloading and installing software on a hard disk. This might be, probably, because of the acute shortage of electricity, difficulty in accessing computer and non-organization of seminars/workshops in the rural area. On a general note, the average mean respondent of secondary school science teachers in rural area is 2.9 indicating that they met the NCST in basic computer knowledge.

Research question 4

What is the basic computer literacy attainment level of male secondary school science teachers in Delta State Capital Territory, Nigeria?

Answer to research question 4

Answer to research question 4 is as shown in table 3. Data in table 3 show that male secondary school science teachers in Delta State Capital Territory of Nigeria attained high level of basic computer literacy in all the basic computer literacy items in BACOLAL. This disagrees with the findings of [10] and [11] that teachers are ill-prepared in the use of computers in teaching learning process. This disagreement might stem from the fact that teachers used in their separate studies might have, probably, been drawn from different samples. The average mean (\bar{X}) of 3.2 indicated against the male science teachers showed that, in general, they met the NCST in basic computer knowledge.

Table-3: Responses of Secondary School Science Teachers on Basic Computer Literacy Item According to Gender

S/N	Basic Computer Literacy Item	Sch. Location	N	HL	L	I	HI	\bar{X}	Decision
1	Do you have knowledge of backup files?	Male	84	42	17	18	7	3.1	HBCL*
		Female	51	38	4	6	3	3.5	HBCL
2	Do you have knowledge of minimizing, maximizing and moving windows?	Male	84	64	5	5	10	3.5	HBCL
		Female	51	33	7	6	5	3.3	HBCL
3	Do you have the ability to check how much space left on a drive or other storage devices?	Male	84	79	1	3	1	3.9	HBCL
		Female	51	22	9	10	10	2.8	HBCL
4	Can you start-up, log-in and shut-down a computer system, properly?	Male	84	72	1	6	5	3.7	HBCL
		Female	51	32	9	7	3	3.4	HBCL
5	Can you download and install software on a hard disk?	Male	84	16	28	20	20	2.5	HBCL
		Female	51	7	14	10	20	2.3	DHBCL**
6	Can you check for and install operating system updates?	Male	84	35	20	14	25	3.0	HBCL
		Female	51	25	8	8	10	2.9	HBCL
7	Do you know the basic computer hardware and terminology?	Male	84	39	18	21	6	3.1	HBCL
		Female	51	23	14	11	3	3.1	HBCL
8	Do you understand and know how to manage files?	Male	84	27	34	12	11	2.9	HBCL
		Female	51	16	15	7	13	3.0	HBCL
Average Mean Responses		Male	84	47	16	12	9	3.2	HBCL
		Female	51	26	9	8	8	3.0	HBCL

* Have Basic Computer Literacy

** Don't Have Basic Computer Literacy

Research question 5

What is the basic computer literacy attainment level of the female secondary school science teachers in Delta State Capital Territory, Nigeria?

Answer to question 5

The basic computer literacy attainment level of the female secondary school science teachers in Delta State Capital Territory of Nigeria is as shown in table 3. Data in table 3 reveals that the female secondary school science teachers exhibited high level of attainment in basic computer literacy items, except in item 5 where they had a mean (\bar{X}) of 2.3 which is below the criterion mean (\bar{X}) of 2.5. This finding agrees with the finding of [12] who reported that students in our contemporary schools are more literate in the ICT than their teachers. This might be as a result of the domestic challenges faced by the female teachers that would not allow them to go for computer training. However, average mean (\bar{X}) of 3.0 from female science teachers in table 3 shows that they have attained appreciable basic computer literacy level and so, met NCST in basic computer knowledge.

Research question 6

What is the difference in basic computer literacy attainment level between the male and female secondary school science teachers In Delta State Capital Territory, Nigeria?

Answer to research question 6

The difference in basic computer literacy attainment level between the male and female secondary school science teachers in Delta State Capital

Territory of Nigeria is as shown in table 3. The male secondary school science teachers had average mean (\bar{X}) of 3.2, while their female counterparts had average mean (\bar{X}) of 3.0. The difference in mean (\bar{X}) in basic computer literacy attainment level between the male and female science teachers is 0.2 in favour of the male science teachers. This agrees with [13], who affirms that the difference in achievement between male and female is minimal, if both of them are given equal opportunity. This minimal difference has arisen from the fact that the male and female secondary school science teachers were all selected from the same environment (Delta State Capital Territory, Nigeria).

Research question 7

What is the difference in basic computer literacy attainment level between the urban and rural secondary school science teachers in Delta State Capital Territory, Nigeria?

Answer to research question 7

The answer to the research question 7 is as found in table 2. Data in table 2 show that the average mean (\bar{X}) basic computer literacy attainment level for urban secondary schools is 3.1, while that of their counterparts in rural schools is 3.3. The average mean difference between the two set of science teachers is 0.2 in favour of rural teachers. This disagrees with the finding of [11] that teachers in urban schools have more access to computers than their counterparts in rural schools. The slight difference in average mean (\bar{X}) basic computer literacy attainment level between the science teachers in both urban and rural schools might

be based on individual interest of the teachers to be computer literate.

CONCLUSION

The secondary school science teachers in Delta State Capital Territory have attained high level of basic computer literacy as indicated by the average mean (\bar{X}) responses of science teachers in table 1. Also, science teachers in both urban and rural areas of Delta State Capital Territory have appreciable high level of attainment of basic computer literacy, having recorded average mean responses of 3.1 and 3.3, respectively, as shown in table 2. The male and female secondary school science teachers have average responses of 3.2 and 3.3, respectively, as shown in table 3, indicating that they have high level of attainment on basic computer literacy. On the basis of NCST, science teachers in secondary schools in Delta State Capital Territory of Nigeria are regarded as being highly computer literate and are said to have met the basic computer knowledge standard.

RECOMMENDATIONS

From the aforementioned results, the researchers recommend that all secondary school teachers in Delta State Capital Territory be exposed to basic computer knowledge, especially on downloading and installing software on a hard disk. In addition, constant basic computer literacy seminar/workshop should be organized for secondary school science teachers in Delta State to encourage sustainable high computer literacy level among teachers in the secondary schools.

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