Assessment of Information and Communication Technologies Awareness Level Among Secondary School Students in Delta State

ABSTRACT

The major purpose of this study is the assessment of ICTs awareness level among senior secondary school students, Ethiope East Local Government Area in Delta State. The study made effort to examine the assessment of ICTs awareness level among senior secondary school students, based on the statement of problems, five research questions were raised and answered. The study adopted a survey oriented method design. The sample for the study consists of 119 respondents selected from 24 secondary schools in Ethiope East Local Government Area, Delta State. The responses of the 20 items questionnaire developed were analysed through the simple percentage, mean and chi-square. The findings from the analysis show(s) that lack of ICTs/computer laboratory in senior secondary schools do(does) not affect the awareness level of ICTs among senior secondary school students, second findings revealed that lack of student access to ICTs in senior secondary schools do(does) not affect the awareness level of ICTs among senior secondary schools students, the third finding revealed that inadequate ICTs facilities/equipments in senior secondary school do(does) not affect the awareness level of ICTs among senior secondary school students. Furthermore, the fourth finding revealed that students' perceive ineffectiveness of ICTs for learning in senior secondary school (does) not affect the awareness level of ICTs among senior secondary school students. The fifth and final finding revealed that factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students. Based on the findings, it was recommended that adequate ICTs instructional teaching aid should be provided in the senior secondary school. Teachers should try to introduce to the senior secondary students the current trend in ICTs education(,)(.) (At) at that level training and retraining of secondary school teachers on the use of ICTs should be encouraged by government. (T)this research work is a product of recent survey carried out by the research, hence the findings reported here are original and reflect the current views of assessment of ICTs awareness level among senior secondary students in Delta State.

Key word: Information Technology, communication, awareness level, secondary school

1.1. Background to the Study

Nigeria have witnessed the development of ICTs in various sectors over the last decade including education. The change from teacher-centered education system to learner-centered education the world over in the past view years contributes to ICTs awareness among senior secondary school students in Delta State. Borrowing from the word "Knowledge Driven World" as conceived by (Adelabu & Adu.2020). Education reform policies of government has focus(ed) on equal access and quality of education using ICTs, this necessitates the awareness of ICTs in senior secondary school in Delta State through use of ICTs and equipping secondary schools' teachers with enhanced skills to teach the senior secondary students in the 21st century, these will bring awareness of ICTs to senior secondary school students in Delta State.

The use of ICTs in Nigeria and African countries generally is increasing and dramatically growing. However, while there is a great deal of knowledge about how ICTs are being used in developed countries, there is not much information on how ICTs are being introduced into schools in developing countries (Beukes-Amiss and Chiware, 2006). Looking at the developing countries according to these authors, there is generally limited access time per month using ICTs by both the teachers and students, and even less time spent with reliable internet access. It should be noted that availability of ICTs vis-à-vis access in terms of ratio of teachers and students differs significantly. Despite this, the new and emerging technologies challenges the traditional process of teaching and learning and the way education is managed. While information and communication technologies (ICTs) is an important area of study in its own right, it is having a major impact across all curriculum areas. Easy worldwide communication provides instant access to vast array of data, challenging assimilation and assessment skills (Fowowe, 2006).

Rapid communication plus access to ICTs in Senior Secondary Schools in Delta State bring awareness of ICTs to the students of secondary schools in Delta State. Formerly the term "IT" was used to mean ICTs the term which was synonymous with computer but as (with) the passage of time, it covered other equipment created to enhance acquisition, storage and dissemination of information materials. Most of these equipment(s) were initially confine(d) to the vicinity of offices. Libraries in the course of time embraced the use of these equipment(s) to carry out their day-to-day activities as usage was adopted to carry out some routine activities (Owan & Asuquo, 2021). According to the author, its functions does (do) not end there. The current issue is the use of ICTs in the classroom by the teachers, which brings and promote awareness of ICTs among senior secondary school students. This includes specifically the use of computers, internet, telephone, digital camera, data projector.

As the world continues to revolve around, technology, teachers need to continue incorporating these new technologies into their teaching. Meanwhile, it is observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. Most of these studies were carried out in developed countries where the use of ICTs has come of age and where there are resources and material to maintain them. However, the use of ICTs by teachers in Nigeria is just beginning to gain popularity and researches in the area have just started emerging. Emphatically, the use of ICTs by teachers to teach the students is highly advantageous. This is because its enable them to demonstrate(,) understanding of the opportunities and implications of the uses for learning and teaching in the curriculum context, plan, implement and manage learning and teaching in open and flexible learning environment (UNESCO, 2004). In the light of these therefore, more research is needed to showcase further assessment of awareness level of ICTs among senior secondary school students in Delta State, Nigeria.

Information and Communication Technologies (ICTs) are electronic technologies used for information storage, processes and retrieval. Development is partly determined by the ability to establish a synergistic interaction between technological innovation and human values (Nwagwu, 2006). Information and Communication Technologies (ICTs) have a significant impact on all areas of human activity (Brakel and Chisenga, 2003). In a global economy that is driven by information and Communication Technologies (ICTs), knowledge of ICTs has become an important aspect of information literacy campaign. Moreover, ICTs applications in the education sector has revolutionized the methods of teaching and learning. Teaching and learning in the information and communication technologies (ICTs) driven environment is (are) no longer restricted to the four wall(s) of classroom as students and teachers can now communicate and interact in the virtual classroom.

Owan & Asuquo, (2021)opined that educational institutions still remain illequipped with modern ICT facilities. Again, Akomolafe (2008) noted that ICT resources in secondary schools are still grossly inadequate. The author further stressed that ICT in secondary school is still at the initial stage and the school system still faces a lot of challenges as far as infrastructural resources are concerned. The challenges ranged from financial constraints, inadequate electricity, inadequate technical experts to handle the maintenance of ICT resources and teachers' incompetence in the use of ICT tools to enhance teaching and learning at the secondary school level. Secondary education is that level of education that is aimed at producing graduates (learners) for higher education as well as equipping the students with sustained ICT skill needed to function effectively in this era of emerging technological advancement. In response to the global influence of ICTs on education, governments and non-governmental organization in developing countries are now investing in educational technologies with a view to bridge digital divide and enhance teaching and learning in the new information society. In line with this global development, the Federal Government of Nigeria in the National Policy on

education (Metu 2020), recognizes the prominent roles of ICTs in the modern world and has integrated ICTs into education in Nigeria. The general objectives of the policy are to ensure that the general populace appreciates the impact of information and communication technologies (ICTs) and computer on today's society and to enable the present generation of school children at all levels to appreciate the potentials of the ICTs and computer to enable them to be able to use the computer in various aspects of life and later occupations (Arthur & Adu 2022).

In order to ensure full implementation of the National Policy on Computer Education in Nigeria, the state government (including – Delta State) introduced computer education and literacy into secondary schools in 1997 (Bada, Ajibade and Ojedokun, 2009), (Adomi and Kpangban, 2010). The general objectives of the computer literacy programme are: to bring about computer literacy in each state in Nigeria; develop the use of computers as a teaching tool in all subject areas and to familiarize students with the use of computer technology (Information and Communication Technologies); enable the present generation of school children at the secondary school level to appreciate the potentials of the computer and to be able to utilize the computer in various aspects of life and later occupations; and to expose teachers and students to the latest scientific knowledge and skills.

Another major effort towards improving ICTs integration in the Nigeria society was the 2001 National Policy on Information Technologies, tagged "Use IT" (Yusuf, 2007). As a result of these steps over the years, education sector has witness tremendous improvement in the area of application of ICTs for teaching and learning in all facets of education systems. However, the situations in senior secondary schools have not been fully addressed. More than a decade ago, (Jegede and Owolabi, 2003), compares Nigeria national Computer policy of 1987 with the existing `school practice and found that computer education in Nigeria was limited to (F) federal unity schools and was scarcely offered in any of the secondary schools which constitute more than 80% of Nigerian

schools. However, the contribution of private sectors in education system has elevated the use of ICTs in both private and public schools especially in Delta State, Nigeria. And how are the secondary schools students in Delta State responding to these new technologies in their schools/environment? (These) (This poser) call(s) for a research of this nature for better understanding of how secondary school students in Delta State of Nigeria are responding to the technologies of the new information (age) (society). There is need to improve the teaching level of information and communication technologies (ICTs) in senior secondary schools in Delta State, so as to create awareness. The only method to achieve this is the availability of ICTs in the senior secondary schools in Delta State.

1.2. Statement of the Problem

Information and Communication Technologies (ICTs) awareness is needed in the senior secondary school(s) in Delta State, so as to enhance students use of ICTs in this technology driven era. However, research and observation reveal(s) that these schools have no ICTs/computer laboratory to create awareness (in the senior secondary schools in Delta State), students do not have access to ICTs in their schools, ICTs facilities/equipments available seem not to be adequate, students perceived the ineffectiveness of ICTs for learning and factors hindering teachers readiness and confidence of using ICTs. These questions prompted the researcher to embark on this study.

1.2 Objective of the study.

This study seek(s) to assess ICTs awareness level among Secondary Schools students in Delta State. The specific objective(s) seek (are) to:

- determine the effect of ICTs/computer laboratory in senior secondary schools on the awareness level of ICTs among secondary school students in Delta State of Nigeria.
- determine (the) effect of students' access to ICTs in senior secondary schools on the awareness level of ICTs among senior secondary school students in Delta State of Nigeria.

- (To) determine the impact of ICTs facilities/equipments in senior secondary schools on the awareness level of ICTs among senior secondary school students in Delta State of Nigeria.
- (To) determine whether students perceived ineffectiveness of ICTs for learning in senior secondary school affect the awareness level of ICTs among senior secondary school students in Delta State of Nigeria.

2.0 Review of Literature

2.1. Conceptual Review

2,1. 1 Concept of Information and Communication Technologies (ICTs)

Information and Communication Technologies (ICTs) have been defined in various ways by several authors. According to Ogunsola (2005) ICTs "is an electronic based system of information transmission, reception processing and retrieval, which drastically changed the way(,) we think(,) the way we live and the environment in which we live". In another dimension, Onyije and Opara (2013) defined ICTs as tools or resources that could be used to process, store,(perverse – **is this what you mean or an error?)**, retrieve and disseminate information with ease.

Another definition of ICTs in the Oxford Advanced Learners "is an electronic media used in processing(,) analysing, storing and sending out information. All these definitions of ICTs have been captured in the description of ICTs as advanced by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as: the tools and the process to access, retrieve, store, organise, manipulate, produce, present and exchange information by electronic and other automated means. These include(s) hardware, software and telecommunications in the forms of personal computers, scanners, digital cameras, phones, faxes, modems, CD and DVD players and recorders, digitized video, radio and TV programmes, database programmes and multimedia programmes" (Elege *et al* 2019).

The application of ICTs in education has affected teaching and learning in various dimensions. ICTs is said to have the potentials of being used to meet the learning needs

of individual students, promote equality of educational opportunities; offer high quality learning materials, increase self-efficacy and independence of learning among students and improve teachers professional development (Elekwa 2020). Its application has also resulted into shift in the methods of teaching and learning in the 21st century classrooms.

Elege (2019) notes that "this shift which has been driven by the plethora of new information and communication devices now increasingly available to students in senior secondary schools and at homes, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills". Studies have identified various types of ICTs available for teaching and learning. According to Asuquo (2021), ICTs available in classrooms include simple tool-based applications such as word processors, online repositories of scientific data, primary historical documents, handheld computers, closed-circuit television channels and two-way distance learning classrooms.

To successfully operate in the new e-learning environment, (the)knowledge of how these identified ICTs tools become(s) necessary for both teachers and students. Lau and Sim (2008) reported that despite the apparent benefits of the use of ICTs for educational purpose(.) (,studies)(Studies) show that in many cases the learning potential of ICTs is deprived as many teachers and students are still not fully ICT literate. The benefits derivable from the application of ICTs in the education sectors can only be maximized when the potential users are competent in the usage of the new technology.

2.1.2 **ICTs in Education and for Education**

The idea that teaching and learning can successfully take place through the application of electronic communication facilities between teachers and students is one which had generated sometimes, hope and dismay and at other times, excitement and fear. Hope that many more learners can (could) be reached at a more convenient pace that had the infrastructure(s) necessary for deploying an effective ICTs platform is lacking in low income countries (Olakulehin, 2007). However the use of information and

communication technologies in the education process has been divided into broad categories: ICTs for Education and ICTs in Education. ICTs for education connote the development of information and communication technologies specifically for teaching/learning purposes, while the ICT in education(al) involves the adoption of general components of information and communication technologies in the teaching/learning process (Arthur & Kaku 2020).

Generally, however the educational relevance of computers and other components of information technologies cannot be overemphasized. Reference can be made to the period when (S)(s)kinner applied programmed instructions to teaching machines through Brunner's experiment with computers in instruction to the current wave of information transmission and exchange through the World Wide Web; we have seen different applications of ICTs in enhancing cognitive development. Thomas and Ranga in UNESCO (2004) in their classification divided the application of computers and other communication technologies in education into three broad, categories. These are pedagogy, training and continuing education.

The pedagogical applicability of the ICTs is concerned essentially with the more effective learning and with the support of the various components of ICTs. Almost all subjects ranging from mathematics (the most structured) to music (the least structured) can be learnt with the help of computers. Olakulehin (2007) emphasized that pedagogic application of ICTs involves effective learning with the aid of computers and other information technologies serving the purpose of learning aids which plays complementary roles in teaching/learning situations rather than supplements to the teacher/instructor/facilitator.

2.1.3 ICTs Awareness in Senior Secondary School

Adelabu & Adu (2020) revealed that many of the secondary school computer study teachers indicated that they experience a sense of isolation and a lack of collegial support within schools. Nothing (Noting) that rapid changes to ICTs computer and teaching

provide significant challenges, the teachers also indicated that their greatest development need was actually finding time for their own on-going learning.

Computer Science Teachers Association (CSTA, 2005) also indicated that that on-going battle for adequate resources, the lack of acceptance and understanding of computer study of a scientific discipline distinct from information and communication technologies training and increasing budget cuts in these times of fiscal restraint deterred many interested and qualified teachers from ICTs and teaching of computer studies in senior secondary schools.

One additional persistent and often ignored in (point is) that there is little motivation for those with the requisite (,) skills to pursue a career in teaching secondary school students computer study that can lead/promote ICTs awareness in senior secondary schools. In most jurisdictions, teachers' salaries are so low and the working conditions too unpleasant when compared to other career fields, that it is impossible for education to attract individuals with the appropriate skills for ICTs awareness. Even for those who are considering a second career in ICT for whom salary issues may not be a primary factor, the lack of consistent and readily available information concerning certification requirements make it almost impossible to determine how one should go about preparing for such a career change. At present, many of the ICTs awareness that occur within secondary schools are the result of small-scale bottom up innovation at the individual secondary school level. Usually, such change is structural and superficial and rarely translates into large-scale innovation at the system or national levels (Ekpoh & Asuquo, 2017).

2.1.4 Teacher Uses of ICTs

Previous studies into teacher use of ICTs have identified staff development as one of the contributing factors in using ICTs effectively in the classroom. McCarney (2004) give (gave) a report on an investigation into effective staff development in ICTs for teachers. Teachers have been surveyed to investigate the impact of different models of staff

development in ICTs on the teacher and to explore the knowledge and skills gained by teachers from staff development in ICTs on the teacher and to explore the knowledge and skills gained by teachers from staff development; technical; academic/content-related; pedagogy. The results indicate the need for a much greater emphasis to be placed on the pedagogy of ICTs. This should be of interest to all involved in teacher education and the continuing professional developing of teachers.

Asuquo, Emeribe & Anam, (2022), assess students' satisfaction with ICT instruction in secondary schools in Calabar Metropolis, Cross River State, Nigeria. Three research hypotheses were formulated to give direction to the study. The study sample was 5245 students drawn from the population of Senior Secondary (SS) 2 and Senior Secondary (SS) 3 classes across public and private schools in 2019/2020 academic session. A survey research design was adopted for the study. The instrument for data collection was a questionnaire entitled "Secondary School Students' Satisfaction with Computer Studies Questionnaire (SSSSCSQ)". The data collected were analyzed using population t-test and independent t-test.

2.2 Theoretical Framework

Theoretical models applied in general educational studies, in studies on assessment of ICTs awareness level among senior secondary school students and ICT use in education (Law, Yuen, Ki, Li, Lee and Chow (2000), traditionally distinguish three dimensions of analysis: Intended, Implemented and Achieved

The intended dimension refers to the learning goals or objectives of education or ICT use in education which contribute/promote the awareness level of ICTs among senior secondary school students. It is generally described in terms of the achievement targets ICTs used in senior secondary school which create awareness and strategic directions defined in policy documents at a national, regional or school system level.

The implemented dimension refers to ICTs educational processes happening at the school and/or classroom level. It is usually described in terms of use(d) of ICTs learning opportunities offered to students of senior secondary school and depends on curricula,

educational standards, assessment and other implemented structural arrangements of schooling.

B) This study is guided by the ICT-enhanced Teacher Development (ICT eTD) model of Capacity building as advanced by Engida (2011). The ICT eTD model is described as one which recognises that, in order for ICTs awareness in senior secondary school, the teachers need to innovatively and effectively use ICTs in their teaching and leanring (learning) and an in-depth use of ICTs in greater depth of the content of the subject matter they teach (UNESCO-Bangkok, 2012).

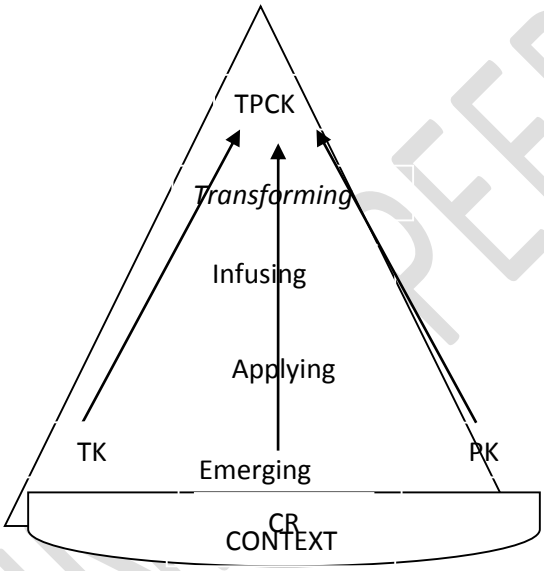

Fig.1 ICT eTD model

Source: Engida 2011

The ICT eTD model integrates the four stages of ICTs integration. A three dimensional pyramid, embedded in a cone, both tapering to the apex from the base where the emerging stage is located (that is for the pyramid) and the circular base of the cone represents the context. The apex of the circular base pyramid includes the transforming stage and is marked at the tip by the highest competence, characterised by technological pedagogical content knowledge (TPCK), which marks the highest level at circular base.

2.3 Empirical Review

Metu et.al (2022), E (e) xamined the views of secondary school students about using information and communication technology in economics classrooms. Three research questions led the investigation. The study used a descriptive research design. The study's population consists of 1675 senior secondary students studying economics in Onitsha metropolis, Anambra State, Nigeria. The multi-stage sampling procedure was used to draw a sample of 432 senior secondary two (SS2) students, with 238 (55 percent) from public and 194 (45 percent) from private secondary schools. Data was collected using a 27-item structured questionnaire. Analysis of data was done through descriptive and inferential statistics. A p-value that is greater or equal to 0.05 was taken as significant. The findings revealed that the students agreed that the ICT facilities listed could be used to teach economics, though the frequency of use by economics teachers was poor, especially in public schools since the result showed a significant difference in favour of the private schools. On the whole, the economics students were of the view that ICT facilities should be employed in teaching economics as it makes the learning of the concepts easier and the topics become clearer. Some recommendations were made based on the findings.

Asuquo, Emeribe & Anam, (2022), assess students' satisfaction with ICT instruction in secondary schools in Calabar Metropolis, Cross River State, Nigeria. Three research hypotheses were formulated to give direction to the study. The study sample was 5245 students drawn from the population of Senior Secondary (SS) 2 and Senior Secondary (SS) 3 classes across public and private schools in 2019/2020 academic session. A survey research design was adopted for the study. The instrument for data collection was a questionnaire entitled "Secondary School Students' Satisfaction with Computer Studies Questionnaire (SSSSCSQ)". The data collected were analyzed using population t-test and independent t-test. The major findings indicated that secondary school

students' satisfaction with ICT instruction was not significantly differ with respect to school ownership, gender and school location. It was recommended among others that the Government at various levels, Non-Governmental Organizations (NGOs) as well as Parents Teachers Association (PTA) should improve in their efforts towards provision of both hardware and software ICT facilities to sustain blended pedagogy in Post Covid-19 era.

Susan Chepkonga (2022) Investigate the Relationship of ICT Access of Principals and ICT integration in Management of Public Secondary Schools in Kenya. The study find out whether there exists a relationship between ICT access of principals and ICT integration in management of public secondary schools in Kenya. Descriptive survey design was used in Nairobi County where quantitative and qualitative research (methods) strategies were applied for the collection of data using questionnaires. The target population comprised of 75 secondary schools in Nairobi County at the time of data collection. Simple Random sampling was used to select the public secondary schools with 7(10%) principals participating in the pilot study. Data collected by questionnaires from 68 principals out of 75 principals were analyzed using Pearson's chi square with the help of Statistical Package for Social Sciences (SPSS) programme. The findings of the analysis of data revealed that there was a significant relationship between the principals' educational level and ICT integration in management of public secondary schools in Kenya. Out of this study recommendations were made to the county government and secondary schools in Nairobi County and Kenya in general.

Indrinal, (2022), Investigate the weak points of students in the awareness and (use) usage of essential software applications as the fundamental inputs to the Program Enhancement for Senior High School (SHS) Technical-Vocational-Livelihood – Information Communication and Technology (TVL-ICT) students at Lopez National Comprehensive High School. The study utilized descriptive method of research conducted at Lopez, Quezon. A purposive sampling method was used in selecting the sample size constituting 36 student-respondents in different age and year levels. The study used Google forms and the survey was conducted via the internet due to the pandemic. The findings of the study showed that the Grade 11 and 12 students are aware of ICT fundamentals and different computer software applications. It was further revealed that there was significant difference in the computer software application awareness between grade 11 and

grade 12 students. In order to improve students' knowledge and literacy in database applications, webpage design, and basic computer programming, an enhancement program may be applied to the specialization or integrated into other ICT subjects

Hailegebreal et al (2022), Assessed utilization ICT and its associated factors among Arba Minch University College Medicine and Health Science students. A cross sectional study design was conducted in June through August 2021 among under graduate students in college of medicine and health science at Arba Minch University, Ethiopia. A self-administered questionnaire was used to collect information on the students' socio-demographic factors as well as the utilization ICT. The data entry form was prepared with Epi-data 3.1 versions software and STATA version 14 software was used to analyze the data. A total of 355 participants enrolled in the study, with a response rate of 98.34%. The percentage of students who used ICT was 55.77% [95% CI, 0.50, 0.60]. Regarding of feld (field)of study, health informatics students (84%) used the most ICT, while midwifery students (52%) used the least. Urban resident [AOR=1.85, 95% CI=1.08, 3.16], ICT knowledge [AOR=3.8, 95% CI=2.25, 6.40], having formal training of ICT [AOR=1.9, 95% CI=1.06,3.48], having IT in current course study [AOR=2.2, 95% CI=1.23, 3.84], and had good IT skill [AOR=2.4, 95% CI=1.34, 4.23] revealed a significant and positive correlation with the use of ICT. Conclusion: In the current study previous residence, ICT knowledge, having formal training, having IT in current courses, and IT skill(s) were significantly associated with student ICT utilization. Therefore, the university should continue to invest in professional development in order to improve teaching and student performance, as well as provide the college with student-centered ICT computer labs to encourage students to use technology

3.1 Research Methodology

The study adopted a descriptive survey research design. The design was chosen because survey research design focuses on people, their believe opinion, attitude. The researcher considered it most appropriate because the study will elicit responses from the students on the assessment of ICTs awareness level among senior secondary school students in Ethiope East Local Government Area of Delta State. The population of the study comprised 5,944 students drawn from twenty-four (24) public senior secondary

schools in Ethiope East Local Government Area of Delta State. The sample size of the study is 119 senior secondary school students from twenty-four (24) secondary schools in Ethiope East Local Government Area of Delta State, the simple random sampling technique was used.(See table 1 in Appendix 1.)

3.2 Research Instrument

The researcher makes (made) use of structured response questionnaire, which is been (was) develop(ed) in line with the research questions. The Likert-type rating sale questionnaire was used, the questionnaire was group (ed) into sections A to F. section A: includes the bio-data of the respondents section B: Do lack of ICTs/Computer laboratory in senior secondary schools affect the awareness level of ICTs among senior secondary school students in Delta State?(.) Section C: Do lack of students access to ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary schools students in Delta State? Section D: Do inadequate ICTs facilities/equipment in senior secondary school affect the awareness level of ICTs among senior secondary schools students in Delta State? Section E: Do students perceive ineffectiveness of ICTs for learning in senior secondary school affect the awareness level of ICTs among senior secondary schools students in Delta State? Section F: Do factors hindering teacher's readiness and confidence of using ICTs in senior secondary school affect the awareness level of ICTs among senior secondary schools students in Delta State? The respondents are to responds to the items of Strongly Agree = SA, Agree = A, Undecided = U, Disagree = D, Strongly Disagree = SD.

3.3 Method of Data Analysis

The simple percentage, mean and chi-square will be used in the analysis of the generated data from the administered questionnaire. The simple percentage will be used to analyses the bio-data of the respondents, mean will be used to analyses the research question, and in testing the research hypothesis, chi-square will be used

- Simple percentage (%) = $\frac{\text{Number of Response}}{\text{Sample Size}} \times \frac{100}{1}$
- Mean = $\frac{\Sigma fx}{\Sigma x}$
- Chi-square $\left(x^2\right)$= $\frac{\left(F_0 - F_e\right)^2}{F_e}$

  where F_o = Observe frequency

  F_e = Expected frequency

4.1 Analysis of the of the Bio-Data of Respondents

Table 1: Sex Distribution of Respondents

Sex	**Number of Respondent**	**Percentage**
Male	69	58
Female	50	42
Total	119	100

Table 1 above show that the male respondents has the highest number of 58%, while female respondents has 42%. This implies that there are more male than female students in senior secondary school, Ethiope East Local Government Area of Delta State.

Table 2: Class Distribution of Respondents

Students' Class	**Number of Respondent**	**Percentage**
SSS 1	18	15
SSS 2	23	19
SSS 3	78	66
Total	119	100

Table 2 indicated that 15% of respondents are students in SSS 1 class, 19% of the respondents are students in SSS 2 class while 66% of respondents are students in SSS 3

class. This implies that majority of the senior secondary school students are in SSS 3 class in Ethiope East Local Government Area of Delta State.

Table 3: Age Distribution of Respondents

Age	**Number of Respondent**	**Percentage**
14 – 15	35	29
16 – 17	49	41
18 – 19	28	24
20 – 21	7	6
Total	119	100

Table 3 indicated that 29% of respondents are between the age bracket of 14 – 15 years, 41% of the respondents are between the age bracket of 16 – 17 years, 24% of the respondents are between the age bracket of 18 – 19 years, while 6% of the respondents are between the age bracket of 20 – 21 years. This implies that majority of the senior secondary school students in Ethiope East Local Government Area of Delta State are between the age bracket of 16 – 17 years.

Research Question 1: Do lack of ICTs/Computer Laboratory in Senior Secondary Schools affect the awareness level of ICTs among senior secondary school students?

Items	**SA**	**A**	**U**	**D**	**SD**	**Mean** $\bar{X}$	**Agg mean**	**Criterion**	**decision**
1.	99	20	0	0	0	4.83			Accept
2.	61	55	3	0	0	4.49	4.41	2.5	Accept
3.	51	46	7	14	1	4.11	4.41		Accept
4.	46	59	6	8	0	4.20		2.5	Accept

Table 4 ICTs/Computer laboratory in senior secondary schools

Table four (4) Analysis

The table one above shows that lack of ICTs/Computer laboratory in senior secondary schools affect the awareness level of ICTs among senior secondary school students because the aggregate mean (4.41) is well above the criterion mean (2.5), this is in line with Ndiku (2003), cited by Wins and Lawler (2007) who opined that insufficient numbers of computers, ICTs gadgets and peripheral devices inhibit deployment of ICTs in Secondary Schools.

Table 5: students access to ICTs in senior secondary schools

Research Question 2: Do lack of Students access to ICTs in Senior Secondary Schools affect the awareness level of ICTs among senior secondary schools students?

Items	**SA**	**A**	**U**	**D**	**SD**	**Mean** $\overline{X}$	**Agg mean**	**Criterion**	**decision**
5.	85	32	1	1	0	4.69	4.27	2.5	Accept
6.	35	63	10	10	1	4.02			Accept
7.	51	51	9	8	0	4.22			Accept
8.	40	63	12	3	1	4.16			Accept
							4.27	2.5	Accept

Table five (5) Analysis

In table two above, shows that lack of students access to ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary schools students, because the aggregate mean (4.27) is above the criterion mean (2.5); this is in line with Okwudishu (2005), which states that unavailability of some ICTs components in schools hampered teachers use of ICTs and students cannot access ICTs in their schools due to the ICTs unavailability, which affect the students' use of ICTs in schools.

Table 6 inadequate ICTs Facilities/Equipments in Senior Secondary School

Research Question 3: Do inadequate ICTs facilities/equipment in senior secondary school affect the awareness level of ICTs among senior secondary schools students?

Items	**SA**	**A**	**U**	**D**	**SD**	**Mean** $\overline{X}$	**Agg mean**	**Criterion**	**decision**
9.	92	20	4	3	0	4.69	4.35	2.5	Accept
10.	63	45	4	6	1	4.37			Accept
11.	50	47	11	10	1	4.13			Accept
12.	40	56	17	5	1	4.08			Accept
							4.35	2.5	Accept

Table six (6) Analysis

In table three above, shows that inadequate ICTs Facilities/Equipments in Senior Secondary School affect the awareness level of ICTs among senior secondary schools students, because the aggregate mean (4.32) is greater than the criterion mean (2.5), this is in line with Lawler (2007) which states that inadequate ICTs facilities/equipments in secondary schools affect deployment of ICTs by teachers which affect the awareness level of ICTs among senior secondary school students.

Table 7 students perceive ineffectiveness of ICTs for learning in senior secondary schools

Research Question 4: Do students perceive ineffectiveness of ICTs for learning in senior secondary schools affect the awareness level of ICTs among senior secondary school students.

Items	SA	A	U	D	SD	Mean $\overline{X}$	Agg mean	Criterion	decision
13.	78	21	11	7	2	4.40	3.53	2.5	Accept
14.	41	68	4	4	2	4.22			Accept
15.	36	46	12	5	20	3.61			Accept
16.	8	17	7	6	81	1.87			Reject
							3.35	2.5	Accept

Table seven (7) Analysis

In the table four above shows that students perceive ineffectiveness of ICTs for learning in senior secondary schools affect the awareness level of ICTs among senior secondary students, because the aggregate mean (3.53) is greater than the criterion mean (2.5), this is in line with NTDA (2003), which posit that the widespread ignorance and misconceptions about ICTs among secondary schools students for learning, rather than being seen as a tool for development, ICTs for learning is seen as a hurdle. This misconception affects the awareness level of ICTs among senior secondary school students.

Table 8 Factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools

Research Questions: Do factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary school students?

Items	SA	A	U	D	SD	Mean $\overline{X}$	Agg mean	Criterion	decision
17.	82	21	7	9	0	4.48	4.20	2.5	Accept
18.	47	57	8	5	2	4.19			Accept
19.	55	49	10	5	0	4.29			Accept
20.	30	52	29	5	3	3.85			Accept
							4.20	2.5	

Table eight (8) Analysis

In the table five above, shows that factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary school students, because the aggregate mean (4.20) is greater than the criterion mean (2.5), this is in line with Author (2005), which revealed that many of the secondary school computer study teachers indicated that they experience a sense of isolation and a lack of collegial support within schools, noting that rapid changes to ICTs to ICTs and teaching provide significant challenges which can affect the awareness level of ICTs among senior secondary school students.

Testing of Hypotheses

Hypothesis 1

Table 9: Chi-square analysis of; 36

Items	**SA**	**A**	**U**	**D**	**SD**	**DF**	x^2 **cal**	x^2 **crit**	**p-value**	**Decision**
1.	99	20	0	0	0	9	107	16.92	0.05	Reject Null Hypothesis
2.	61	55	3	0	0					
3.	51	46	7	14	1					
4.	46	59	6	8	0					
F_e	64.3	45.0	4.0	5.5	0.25					

Responses	F_o	F_e	$F_o - F_e$	$(F_o - F_e)^2$	$\frac{(F_o - F_e)^2}{F_e}$
SA	257	64.3	192.7	37133.29	577.5006221
A	180	45.0	135	18225	405
U	16	4.0	12	144	36
D	22	5.5	16.5	272.25	49.5
SD	1	0.25	0.75	0.5625	2.25
Total					107

The table 9 analysis results above show that chi-square (x^2) as test statistics at significant level of 0.05 and the degree of freedom (df) = 9, computed chi-square (x^2)=107 and chi-square critical (x^2) = 16.92. This implies that the Null hypothesis (H_0) at 0.05 level of significance is rejected, because chi-square (x^2) computed is greater than chi-square (x^2)

critical. Therefore, the alternative hypothesis (H_a) accepted. This implies that lack of ICTs/computer laboratory in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students in Delta State.

Hypothesis 2:

Table 10: Chi-square analysis; Do lack of students' access to ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary school students?

Items	**SA**	**A**	**U**	**D**	**SD**	**DF**	x^2 **cal**	x^2 **crit**	**p-value**	**Decision**
5.	85	32	1	1	0	9	107	16.92	0.05	Reject Null Hypothesis
6.	35	63	10	10	1					
7.	51	51	9	8	0					
8.	40	63	12	3	1					
F_e	52.8	52.3	8	5.5	0.5					

Responses	F_o	F_e	$F_o - F_e$	$(F_o - F_e)^2$	$\frac{(F_o - F_e)^2}{F_e}$
SA	211	52.8	158.2	25027.24	474.007576
A	209	52.3	156.7	24554.89	469.5007648
U	32	8	24	576	72
D	22	5.5	16.5	272.25	49.5
SD	2	0.5	1.5	2.25	4.5
Total					107

Table 10 analysis results above show that chi-square (x^2) as test statistics at significant level of 0.05 and the degree of freedom (df) = 9 computed chi-square (x^2) computed = 107 and chi-square critical (x^2) = 16.92. This implies that the null hypothesis

(H_0) at 0.05 level of significance is rejected, because chi-square (x^2) computed is greater than chi-square (x^2) critical. Therefore, the alternative hypothesis (H_a) accepted. This implies that lack of students access to ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students.

Hypothesis 3:

Table 11: Chi-square analysis; Do inadequate facilities/ equipment's in Senior Secondary School affect the awareness level of ICTs among senior secondary schools students?

Items	**SA**	**A**	**U**	**D**	**SD**	**DF**	x^2 **cal**	x^2 **crit**	**p-value**	**Decision**
9.	92	20	4	3	0	9	107	16.92	0.05	Reject Null Hypothesis
10.	63	45	4	6	1					
11.	50	47	11	10	1					
12.	40	56	17	5	1					
F_e	61.3	42	9	6	0.75					

Responses	F_o	F_e	$F_o - F_e$	$(F_o - F_e)^2$	$\frac{(F_o - F_e)^2}{F_e}$
SA	245	61.3	183.7	33745.69	550.5006525
A	168	42	126	15876	378
U	36	9	27	729	81
D	24	6	18	324	54
SD	3	0.75	2.25	5.0625	6.75
Total					107

Table 11 analysis results above show that chi-square (x^2) as test statistics at significant level of 0.05 and the degree of freedom (df)=9, computed chi-square (x^2) =

107 and chi-square critical (x^2)= 16.92. This implies that the null hypothesis (H_0) at 0.05 level of significance is rejected, because chi-square (x^2) computed is greater than chi-square (x^2) critical. Therefore, the alternative hypothesis (H_a) accepted. This implies that inadequate facilities/equipments in senior secondary school do not affect the awareness level of ICTs among senior secondary schools students.

Hypothesis 4

Table 12 : Chi-square analysis; Do students perceive ineffectiveness of ICTs for learning in senior secondary school affect the awareness level of ICTs among senior secondary school students?

Items	**SA**	**A**	**U**	**D**	**SD**	**DF**	x^2 **cal**	x^2 **crit**	**p-value**	**Decision**
13.	78	21	11	7	2	9	107	16.92	0.05	Reject Null Hypothesis
14.	41	68	4	4	2					
15.	36	46	12	5	20					
16.	8	17	7	6	81					
F_e	40.75	38	8.5	5.5	26.25					

Responses	F_o	F_e	$F_o - F_e$	$(F_o - F_e)^2$	$\frac{(F_o - F_e)^2}{F_e}$
SA	163	40.75	122.25	14945.0625	366.75
A	152	38	114	12996	342
U	34	8.5	25.5	650.25	76.5
D	22	5.5	16.5	272.25	49.5
SD	105	26.25	78.75	6201.5625	236.25
Total					107

Table 12 analysis results above show that chi-square (x^2) as test statistics at significant level of 0.05 and the degree of freedom (df)=9, computer chi-square (x^2)=107

and chi-square critical (x^2)=16.92. This implies that the null hypothesis (H_0) at 0.05 level of significance is rejected, because chi-square (x^2) computed is greater than chi-square (x^2) critical. Therefore, the alternative hypothesis (H_a) accepted. This implies that students perceive ineffectiveness of ICTs for learning in senior secondary school do not affect the awareness level of ICTs among senior secondary school students.

Hypothesis 5

Table 13: Chi-square analysis; Do factors hindering teachers readiness and confidence of using ICTs in senior secondary schools affect the awareness level of ICTs among senior secondary school students?

Items	**SA**	**A**	**U**	**D**	**SD**	**DF**	x^2 **cal**	x^2 **crit**	**p-value**	**Decision**
17.	82	21	7	9	0	9	107	16.92	0.05	Reject Null Hypothesis
18.	47	57	8	5	2					
19.	55	49	10	5	0					
20.	30	52	29	5	3					
F_e	53.5	44.75	13.5	6	1.25					

Responses	F_o	F_e	$F_o - F_e$	$(F_o - F_e)^2$	$\frac{(F_o - F_e)^2}{F_e}$
SA	214	53.5	160.5	25760.25	481.5
A	179	44.75	134.25	18023.0625	402.75
U	54	13.5	40.5	1640.25	121.5
D	24	6	18	324	54
SD	5	1.25	3.75	14.0625	11.25
Total					107

Table 13 analysis results above show that chi-square (x^2) as test statistics at significant level of 0.05 and the degree of freedom (df)=9, computed chi-square (x^2)=107 and chi-

square critical (x^2) = 16.92. This implies that the null hypothesis (H_o) at 0.05 level of significance is rejected, because chi-square (x^2) computed is greater than chi-square (x^2) critical. Therefore, the alternative hypothesis (H_a) accepted. This implies that factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students.

4.2 Discussion of Findings

This study is on the assessment of ICTs awareness level among senior secondary school students in Delta State. In a time of technological advances in information communication technologies, it is important that senior secondary school students learn through the use of technology. The following findings were revealed in this study. Hypothesis one which reveals that lack of ICTs/computer laboratory in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students this is in line with Ogunsola (2005) which states that ICTs is an electronic based system of information transmission, reception, processing and retrieval, which drastically change the perception, the way students think, the way we live and the environment in which we live.

Hypothesis two indicates that lack of students access to ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary schools students, this is in line with Lau and Sim (2008) reported that despite the apparent benefits of the use of ICTs for educational purpose, studies show that in many cases, the learning potential of ICTs is deprived as many teachers and students are still not fully ICT literate.

Hypothesis three shows that inadequate ICTs facilities/equipments in senior secondary school do not affect the awareness level of ICTs among senior secondary schools students; this is in line with Beattie (2004) who observed that despite the awareness of ICTs among secondary school students due to the environmental change,

ICTs have brought to the contemporary society. Inadequate ICTs facilities is a challenge to full integration of technologies in secondary schools.

The findings in hypothesis four reveal that students perceive ineffectiveness of ICTs for learning in senior secondary school do not affect the awareness level of ICTs among senior secondary school students, this is in line with Computer Science Teachers Association (CSTA, 2005), which posits that the on-going battle for adequate resources, the lack of acceptance by students deterred many interested students from ICTs.

Finally, hypothesis five indicates that factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students, this is in line with Gray and Sonter (2004), which opined that although there appeared to be an awareness of the potential for ICTs in senior secondary school students, teachers indicated that they did not see the introduction of ICTs radically changing the way in which teaching took place, nor changing the teacher-student relationship. Inspite of Elege et.al (2019) report on effective staff development in ICTs for teachers.

1.1 Summary

The research work is aimed at examining the assessment of ICTs awareness level among senior secondary school students in Ethiope East Local Government Area of Delta State. Five research questions were revised and answered based on the stated problems of the study.

Related literatures were reviewed based on theoretical frame work, conceptual framework, review of related empirical studies and appraisal of literature review of the study. The survey oriented method was adopted for this study. The sample size of 119. The sample was selected from 24 secondary schools, Ethiope East Local Government Area of Delta State. Twenty (20) items questionnaire was written by the researcher and validated by the supervisor of the research. This validated instrument was administered to 119 respondents. Based on the analysis, the first findings revealed that lack of

ICTs/computer laboratory in senior secondary schools do not affect the awareness level of ICTs among senior secondary school students. The second findings showed that lack of students access to ICts in senior secondary schools do not affect the awareness level of ICTs among senior secondary schools students.

The findings also reveal that inadequate ICTs facilities/equipments in senior secondary school do not affected the awareness level of ICTs among senior secondary schools students. The findings further reveal that students perceive ineffectiveness of ICTs for learning in senior secondary school do not affect the awareness level of ICTs among senior secondary school students. Finally, the researcher found out that factors hindering teacher's readiness and confidence of using ICTs in senior secondary schools do not affect the awareness level of ICTs among senior secondary schools students.

1.2 Conclusion

Understanding the assessment of ICTs awareness level among senior secondary school students in Ethiope East Local Government Area of Delta State, and taking steps to solve them is the first step toward effectiveness service provision. The assessments of ICTs awareness level among senior secondary school students in Ethiope East Local Government Area of Delta State has been expressed in different forms.

1.3 Recommendations

In considering the results from the study, the researcher has made the following recommendations

1. That adequate ICTs instructional teaching aid should be provided in the senior secondary schools.
2. Teachers should try introduce to the senior secondary student's the current trend in ICTs education at that level.
3. Training and retraining of secondary school teachers on the use of ICTs should be encouraged by government.

4. Existing senior secondary schools should have an ICTs to enable the students acquire good skills to browse, surf the internet and operate the computer.

1.4 Suggestions for Further Studies

The research work was carried out using 24 secondary schools in Ehiope East Local Government Area of Delta State, therefore the areas have been suggested as areas for further research to fill whatever gaps this project has left.

1. Evaluating of factors affecting the awareness level of ICTs in Senior Secondary Schools, Ethiope East Local Government Area of Delta State.
2. Similar Studies should be carried out in other Local Government Area of Delta State.

Similar studies should be carried out in other states of Nigeria.

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Appendix 1

Table 1 Sample Distribution

s/n	Name of Schools	Population	Sample
1.	Agbon College, Okpara Inland	287	5
2.	Agbon secondary school, Otorho Agbon	231	3
3.	Abraka Grammar School, Abraka	211	9
4.	Baptist Medical Centre, Eku	325	2
5.	Egbo Commercial Grammar School, Egbo-Kokori	230	3
6.	Ekpan Ovu Secondary School, Ekpan Ovu	107	3
7.	Eku Girls Secondary School, Eku	402	2
8.	Erho Secondary School, Erho Abraka	392	11
9.	Ibruvwe Secondary School, Samagidi-Kokori	248	3
10.	Igun Secondary School, Igun	285	4
11.	Isiokolo Girls Secondary School, Isiokolo	97	2
12.	Kokori Grammar School, Kokori	205	6
13.	Kokori Mixed Secondary School, Kokori	106	4
14.	Ojeta Secondary School, Abraka	308	8
15.	Okpara Boys Secondary School, Okpara Inland	222	3
16.	Okpara Mixed Secondary School, Okpara Waterside	392	2``

17.	Okurekpo Secondary School, Okurekpo	231	2
18.	Orhoakpo Secondary School, Orhoakpo	312	4
19.	Otorho Secondary School Otorho-Abraka	83	6
20.	Oviore Secondary School, Oviore	377	7
21.	Ovu College, Urhodo Ovu	145	5
22.	Ovu Grammar School, Ovu Inland	322	6
23.	Umiaghwa Secondary School, Oria-Abraka	202	8
24.	Urhroka Secondary School, Urhuoka-Abraka	224	10
	Total	5,944	119

The figures above was derived from the ministry of Basic and Secondary Education, Field office Isiokolo, Ethiope East Local Government Area, Delta State, Nigeria. The sample for the study represented 2% of the population.

GENERAL COMMENTS

- **It is a very good well researched article, however there are some fundamental points to take note.**
- **You have used research questions for your work and to which you have provided answers.**
- **Hypothesis is a different format, a predictive statement.**
- **It could be expressed as Null Hypothesis also called zero hypothesis, hypothesis of no difference, non-directional or two-sided hypothesis.**
- **It could also be expressed as Alternative Hypothesis, a predictive statement, which relates an independent variable to a dependent variable. Example:**
- **Secondary school pupils who are exposed to ICTs would perform better than those are not.**

For your work the hypothesis for Item 1 could be stated thus:

H_0: Lack of ICTs/Computer laboratory in Senior Secondary Schools will not affect the awareness level of ICTs among senior secondary school students.

H_1: Lack of ICTs/Computer laboratory in Senior Secondary Schools will affect the awareness level of ICTs among senior secondary school students.

They are used for experimentation when a treatment or an approach or a teaching method has been used and you wish to determine the effect on the both experimental and control groups and when variables are related.

Keys to the colours:

Greenish blue indicators are to be deleted
Brown indicators are to replace or to include in some of the sentences