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RESEARCH ARTICLE

ASSESSMENT OF COMPUTER STUDIES TEACHERS' CONSTRAINTS IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY.

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Abstract

The study investigated Computer Studies Teachers' Constraints in the use of Information and Communication Technology (ICT) in Senior Secondary Schools in Bayelsa West Senatorial District in Bayelsa State. The work was undertaken to find out if Computer Studies Teachers' constraints in the use of ICT in teaching in Senior Secondary Schools differ significantly with respect to gender, location, experience level and qualification. As a result, the researcher raised nine research questions and also formulated four null hypotheses to guide the study. The variables in the study were systematically reviewed from relevant literatures. An instrument was designed to collect data on the variables and the questionnaire was administered to 104 Computer Studies teachers obtained through simple random sampling of balloting and stratified random sampling. The instrument was validated in its content, face and constructs values. With construct validity a factor loadings matrix ranging from 0.632 to 0.910 in all items. A reliability coefficient of 0.827 was obtained with the use of Cronbach alpha technique. The data collected were analyzed and tested using the t-test statistical analysis at 0.05 level of significance. The findings showed that the four null hypotheses were rejected. This is an indication that Computer Studies teachers' constraints in the use of ICT in teaching differed significantly with respect to gender, location, experience level and qualification. From the findings, it was recommended that the National Policy on Education concerning ICT education should be reviewed in line with the New Curriculum for Senior Secondary Schools that made Computer Studies with the use of ICT compulsory and all Policy Statements regarding ICT should be implemented in all levels of the educational system.

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Introduction:-

The society in which we live is constantly changing. As we move through the information age, technological advances are changing and our educational sector is not immune to these changes (Griffin, 2003). The present importance of computer applications in virtually all the fields of human endeavour such as engineering, medicine, education, banking, business among others cannot be over emphasized. There is emphasis of being computer literate

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in the country. In this regard, Joint Admission and Matriculation Board (JAMB) have commenced implementation of computer based assessment. Hence, students in secondary school should be exposed to the use of Information and Communication Technology. Successful teaching with the use of Information and Communication Technologies in schools can help students to develop skills both specific to computer, and more generally, that will be useful for them in their future professional and academic lives. Such students will have the advantage of being able to use these computer skills to access, generate, compile, distribute and exchange information effectively.

Information and Communication Technology (ICT) is an umbrella term that includes any communication device or application encompassing radio, television, mobile phones, computer hardware and software, internet, satellite systems and so on as well as the various services and applications associated with them such as video conferencing and distance learning. It is the use of scientific devices in providing information faster and better. It involves the use of the computer software and other communication services together with their associated documentation. ICT brought about the use of internet.

The recent developments in the Nigerian education sector which indicate some level of ICT application in the secondary schools, prompted the Federal Government of Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2004), to recognize the prominent role of ICTs in the modern world, and integrated ICTs into education in Nigeria. To actualize this goal, the document states that government will provide necessary infrastructure and training for the integration of ICTs in the secondary school system. To this effect, introduce Computer Studies into our educational system. At the Junior Secondary School, computer education has been made a pre-vocational elective while it is a vocational elective at the Senior Secondary School.

Similarly, the Federal Government in 2011 launched the new Curriculum for all the Senior Secondary Schools Education in Nigeria known as SSEC aimed at producing secondary school graduates who are well prepared for higher education as well as having relevant functional trade and entrepreneurship skills needed for poverty eradication, job creation and wealth generation. The document which was expected to be operational by September 2011 was to start with the Year One of the Senior Secondary School while the old curriculum was expected to be systematically phased out completely by June 2014. The Executive Secretary, Nigerian Educational Research and Development Council, NERDC, Professor Godswill Obioma whose council developed the document, states that the National Council on Education had in 2005 proposed a restructuring of the existing Senior Secondary Education Curriculum that would lead to a complete overhaul and renewal of the obsolete contents, standard and knowledge matter. The Executive Secretary explained that the new curriculum was planned to build on the gains of the 9-year Basic Education Curriculum and to connect logically to the learning experiences in the tertiary education. On the conditions for candidates to sit for public examinations, he stated that the first public examinations based on the new SSEC would be conducted by the West African Examination Council, WAEC, National Examination Council, NECO, and the National Board for Technical and Business Education, NBTE, in 2014. The first batches of graduates were expected to graduate by June 2014. Candidates according to the Senior Secondary Education Curriculum must offer five compulsory cross-cutting subjects which include:

1. English Language
2. General Mathematics
3. One Trade/ Entrepreneurship Studies
4. Computer Studies/ICT
5. Civic Education

Thus, by June 2014, graduates from the new SSEC were expected to possess relevant ICT skills and enterprise culture and become well prepared for their world of work or for higher education as may be applicable (NERDC, 2011).

ICT is not just the bloom of the education system, but also the primary and secondary options required to improve effective and meaningful interaction between teachers and students of secondary schools. It has the power to make students enjoy things that they would normally find time consuming and difficult because it involves practical teaching and student centred and not teachers talking and writing on the chalkboard and student copying from the chalkboard into their notebook without engaging in practical teaching which makes learning boring. ICT is a teaching tool that improves the quality of secondary school student's education and support teachers' work. ICT usage in teaching in public secondary schools will aid effective teachings and learning and help the students acquire

necessary skills that will enable them contribute to the growth, improvement and development of the nation socially and economically.

The place of the computer in the use of ICT in teaching cannot be overemphasized. A computer can be defined as an electronic machine that can accept data as input, processes the data and produces the result as output through a set of instructions called program. Computer Studies on the other hand is the study of the computer which includes the computer hardware and software but not how to use the computer. It is seen as a room (Computer/ICT laboratory) filled with treasures (ICT facilities) and can be assessed by the computer studies teachers. The teachers can take their student into the treasure room and show them the different treasures inside the treasure room and how they operate but not how to use the treasures.

The WAEC Computer Studies syllabus is developed from the National curriculum for Senior Secondary School Computer Studies. The objectives of the syllabus are to test candidates' understanding, knowledge and acquisition of Basic concepts of computer and its applications, Manipulative, computational and problem solving skills, Application of software packages, Operation of computer related devices, Online skills and their applications, Safe attitudes and good practices on effective use of computer and Potential for higher studies in computer related areas (WAEC Computer Studies Syllabus, Pp.1). The list of facilities and major equipment/materials required for the successful implementation of the Computer Studies Senior Secondary School Syllabus includes: Computer set, Laptops, Scanners, Printers, Fax machine, GSM Phone, Memory chips, Hard disks, Flash drives, Internet connectivity, DVD, Compact disks, Cables (power and data), Word processing packages, Database package, spreadsheet packages, presentation packages, BASIC program, Corel Draw (WAEC Computer studies syllabus, 2016, Pp. 43-44).

The use of ICT by Computer Studies Teachers implies that the facilities as stipulated in the computer studies syllabus are used in teaching the subject (Computer Studies). The use of ICT also implies the usage of these diverse set of technological tools and resources together with their associated documentation to communicate, to create, disseminate, store and manage and retrieve information. New instructional techniques that use ICTs provide a different modality of instruments. For the student, ICT use would allow for increased individualization of learning. In schools where ICT technologies are used, students have access to tools that adjust to their attention span and provide valuable and immediate feedback for literacy enhancement, which is currently not fully implemented in the Nigerian school system (Enuku & Enuku, 1999 & 2000). Okebukola (1997), cited by Aduwa-Ogiegbaen and Iyamu (2005), concludes that the computer is not part of classroom technology in more than 90 percent of Nigerian public schools. This implies that the chalkboard and textbook continue to dominate classroom activities in most Nigerian Secondary Schools.

The National Policy on Education by Federal Republic of Nigeria (2004) states that no education system can rise above the quality of its teachers. In the light of this, the policy states that Government shall provide necessary infrastructure and training for the integration of ICT in the school system in recognition of the role of ICT in advancing knowledge and skill in the modern world but made Computer Studies a vocational elective subject for student in Senior Secondary Schools. Okwudishu (2005) discovered that the unavailability of some ICT components in schools hampers teachers' use of ICTs. In order to prepare students for ICT technological education, complete ICT facilities should be made available in secondary schools. Goshit (2006) also observed that most schools, both private and government, do not offer ICT training programmes. The typical African school environment provides neither opportunity nor training in using ICTs (Adomi & Kpangban, 2010). ICT centres have been built for some of the schools in Bayelsa West Senatorial district but have not been equipped with the necessary ICT facilities. ICT facilities are so expensive in Nigeria that the state Government cannot purchase computers that can go round schools. In Bayelsa State, the State Government is the main provider of instructional materials to schools. The state Government has failed in providing computer and other ICT facilities to secondary schools, thereby becoming a problem for the schools and for the teachers to use ICT in teaching effectively. Experience has shown that some undesirable elements make away with the few ICT facilities that are available in most schools in Bayelsa West Senatorial District. Moreso, a large percentage of the teachers employed by Government went through the traditional old system of education and were not trained on the use of ICT before employment while the in-service teachers who ought to be trained and retrained on ICT have been denied the opportunity by Government. Teachers need not only be computer literate but they also need to develop skills in integrating computer (ICT) use into their teaching/learning programmes (Newhouse, 2002) Also, shortage of teachers in most schools in Bayelsa West

Senatorial District would lead to extra workload of ICT teachers resulting to insufficient time to properly implement ICT.

In addition, the Federal Government during the launching of the new curriculum for all senior secondary schools education in Nigeria stipulated that by June 2014 henceforth, graduates from the new SSEC were expected to possess relevant ICT skills to prepare them for their world of work or for higher education as may be applicable and to this effect made Computer Studies with ICT among the five compulsory cross-cutting subjects to be enrolled in WAEC, NECO and NBTE examinations (NERDC, 2011). In spite of this, the number of students offering Computer studies (ICT) in WAEC and NECO examinations in Bayelsa West Senatorial district is very low. Students are yet to embrace computer studies (ICT) as a core subject as it is still seen as a vocational elective subject in WAEC and NECO examinations probably due to poor policy formulation and implementation. It is in the light of the foregoing that this researcher deems it fit to critically examine teachers' constraints in using ICT in teaching in Bayelsa public secondary schools in this dispensation of globalization. The researcher would find out how the constraints affect the teachers based on their gender, location, experience level and qualification.

Literature Review:-

Theoretical and empirical findings related to the study were reviewed. The literature was reviewed under related subheadings.

Constraints in the use of ICT in Teaching:-

Despite the apparent benefits of the use of ICT in schools, research shows that many schools are not implementing it, thus depriving learners and the school community from accessing the potential of ICT (Manduku et al, 2012). Since the 1980s implementation of ICT in schools has been compulsory in the developed nations. This is not so in developing nations such as Nigeria, where implementation is considerably more recent, small-scale and experimental. It is however, universally acknowledged that implementation of ICT in schools has progressed in nearly identical pattern, from formulation of policies, attainment of basic computer skills, computer aided teaching and learning, communications and research, to usage in every subject. While other countries have achieved over 41% implementation of ICT in secondary schools, the percentage in African schools remains very small (Laaria, 2013).

Educators have used different categories to classify the barriers for teachers to use ICT in the classroom (Khalid, 2009). Some researchers have grouped the barriers into two major group of extrinsic and intrinsic barriers. Ertmer (1999) define extrinsic barriers as first-order barrier and cited access, time, support, resources and training and intrinsic barriers as second-order barrier and cited attitudes, beliefs, practices and resistance. Al-Alwani (2005) defined extrinsic barriers as barriers related to organizations rather than individuals and intrinsic barriers as those which are related to teachers, administrators, and individuals.

Balanskat et al. (2006) classified the barriers into micro level barriers, such as those related to teachers' attitudes and approaches to ICT, and Meso level barriers, such as those related to the institutional context. They also added a third group called macro level barriers, such as those related to the wider educational framework. Pelgrum (2001) classifies the barriers into material conditions as referring to the insufficient number of computers or copies of software and the non-material referring to teachers' insufficient ICT knowledge and skills, the difficulty of integrating ICT in instruction, and insufficient teacher time, lack of free time for learning and lack of classroom time for students to use computers.

The constraints militating against the use of Information and Communication Technology in teaching by teachers is attributable to certain human or non-material and materials factors. Some of these are highlighted as follows:

Lack of/insufficient computers and ICT facilities in schools:-

The list of facilities and major equipment/materials required for the teaching of Computer studies according to WAEC syllabus include Computer set, Laptops, Scanners, Printers, Fax machine, GSM Phone, Memory chips, Hard disks, Flash drives, Internet connectivity, DVD, Compact disks, Cables (power and data), Word processing packages, Database packages, spreadsheet packages, presentation packages, BASIC program Corel Draw (WAEC Computer studies syllabus, Pp. 43-44). Ndiku (2003) cited by Wims and Lawler (2007) discovered that insufficient numbers of computers and peripheral devices inhibit deployment of ICT by teachers. Plante and Beattie (2004) also observed that inadequate ICTs was a challenge to integration of technologies in Canadian schools. Similarly,

Okwudishu (2005) discovered that unavailability of some ICT components in schools hampered teachers' use of ICTs. Pelgrum (2001) states that in the US, the most important barriers to high school teachers' use of ICT were insufficient number of computers, teachers in larger schools and city schools reported lack of computers as a barrier and teachers in schools with high minority student populations reported outdated, unreliable computers as a barrier. Kiptalam et al. (2010) observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed country. Sabina (2012) observed that in public secondary schools there is acute shortage of e-learning materials such as on-line/internet connected computers, e-mail facilities, multimedia television, multimedia computer and digital library. Osakwe (2012) states that ICTs have not been used as a way of acquiring new knowledge and skills in secondary schools due to inadequacy of curriculum content and limited access to ICTs. According to Osborne and Hennesy (2003), the limitations on access to hardware and software resources influenced teachers' motivation to use ICT in the classroom. A teacher would have no access to ICT materials because most of these were shared with other teachers (Sicilia, 2005).

Lack of electricity/frequent electricity interruption:-

Electricity problem has been a persistent problem militating against ICT application and use in Nigeria making the few schools with ICT facilities unable to use them regularly (Adomi, 2005a; Adomi, Omodeko, and Otdo, 2004; Adomi, Okiy, and Ruteyan, 2003). According to Agyeman (2007), about 40% of Nigerians enjoy electricity from the national grid however, electric power supply is sporadic, and several communities in the urban areas lack electric power and that rural communities are worse off because of the absence of infrastructures.

Many schools are not yet connected to electricity especially in developing countries, Nigeria inclusive. In such countries the government has not been able to connect all parts of the country to the national electrical grid. Consequently those schools that fall under such areas are left handicapped and may not be able to offer computer studies (Mungai, 2011). According to Mohammed and Yarinchi (2013) Inadequate power supply is one of the major problems confronting teaching and learning process in Nigeria with particular reference to computer among others as it brings about digression, failure to achieve the desired goals and objectives in time. Electricity is essential for the operation of all ICT appliances without which they cannot function effectively (Osakwe, 2012). Rebecca & Marshall (2012) observed that in India, solar panels were used to power community computer terminals located in slum areas that were not connected to the electrical grid.

Lack of/insufficient ICT training opportunities for teachers:-

Teachers in all nations constitute a major input in the accomplishment of educational goals and objectives, also trained and effective teachers are the principal asset of any educational system. Aminu (1987) rightly observes that teachers constitute not only a vital input to education but also a major drive in the production process and in determination of the output system. Teacher education in Nigeria is faced with a lot of challenges in the modern day technology of imparting knowledge in the teaching-learning process. ICT is relatively a very new development in Nigerian educational system and plays a vital role in teacher education to effectively surmount the enormous task of capacity and nation building (Owolabi et.al, 2013). Adako (2006) posits that if Nigeria must catch up with other developing countries at a very reasonable pace, the teachers (nation builders) must be abreast of all new development around the world especially now that the world is seen as a global village. The usage of ICT in facilitating teacher education is still a myriad in Nigeria as many of the teachers are not ICT literate and those under training in colleges of education and Nigerian universities are not fully exposed to the use of ICT in the acquisition of skills and practical teaching and it could be observed that less than 10% of the teachers in Nigerian primary and secondary schools are computer literate, a great challenge facing the effective use of ICT in teaching and learning process in schools (UNESCO, 2000).

One of the objectives of the Nigeria's ICT policy is to integrate ICT into the mainstream of education and to provide training (Osei, 2007). According to Adomi and Kpangban (2010), the typical African school environment provide neither opportunity nor training in using ICTs and that 75% of responding teachers in their study have no or very limited experience and expertise regarding ICT in educational application. According to the African symposium (2011) one of the greatest barriers to proper computer education in several parts of the world is shortage of trained teachers, therefore teachers need to be trained to become sufficiently competent to make personal use of computers, to make use of information and communication technology as a mind tool, to become master of a range of educational paradigms that use ICT, and also to become sufficiently competent to make use of ICT as a tool of teaching. One finding of Pelgrum's (2001) study was that there were not enough training opportunities for teachers

in the use of ICTs in a classroom environment. Similarly, Beggs (2000) found that one of the top three barrier's to teachers' use of ICT in teaching students was the lack of training. According to Becta (2004), the issue of training is certainly complex because it is important to consider several components to ensure the effectiveness of the training which include time for the training, pedagogical training, skills training, and an ICT use in initial teacher training. However, according to Balanskat et al. (2006), inadequate or inappropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICT in the classroom. More than 90% by conservative estimate of the Nigerian secondary school students are unable to use computer (Adako & Aturamu, 2006). The reason for this is not far fetched as the teachers teaching this students are not skilled in computer education and application. Newhouse (2002, Pp.45) state that teachers need not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programmes.

Computer Studies is not a core subject:-

The Federal Government of Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2004), recognizes the prominent role of ICTs in the modern world, and integrated ICTs in education in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school and computer studies was introduced into secondary institution. At the junior secondary school, computer education has been made a pre-vocational elective, and is a vocational elective at the senior secondary school. Computer studies/ICT was introduced alongside other four subjects as one of the trade subjects in the new curriculum for senior secondary schools (NERDC, 2011). Computer studies/ICT was made compulsory in the new curriculum for senior secondary school and was registered as such last year but was deleted from compulsory subject this year; this shows that something was missing somewhere (Okunleye and Ogunleye, 2015). According to Okoye and Ogunleye, the examination bodies (NECO and WAEC) were meant to go round schools to check the availability of equipment and materials required for running a trade subject before they can be allowed to register student for such and invariably most schools do not have the materials required especially public schools.

High price of Computers/ICT facilities:-

ICT facilities are expensive and unaffordable to many individuals, private and some government establishments (Haruna, 2005). Onyeadike (2009) also observe that computer and e-learning facilities are expensive to purchase and as such not all secondary schools can afford them. Adomi (2006) also identify cost as one of the factors which influence provision and use of ICT services, indicating that cost of computers is too high for many to afford. Brakel and Chiseuga (2003) observe that monthly internet rates are exorbitant and the charges for satellite television are unaffordable for most people in Africa. High cost of ICT facilities has made it difficult for Nigerian Secondary Schools to acquire and install ICT facilities for the use of teachers and students (Adomi and Kpangan, 2010). Cost was also identified as a challenge facing implementation of computer education in Kenya secondary schools (Mungai, 2011). Mungai indicate that computers are expensive in Kenya and that majority of individuals and schools cannot afford to buy a computer and consider computer as a luxury item, more expensive than a TV such that it has even become targets for thieves. Most schools cannot connect to the internet due to high costs involved in it. Farrel (2007) argues that high costs for acquisition and maintenance of ICT infrastructure is a challenge that has continued to hamper adoption and implementation of ICT in schools. The cost of equipment in a country like Nigeria with a battered economy and seriously devalued currency is enormous (Idowu and Esere, 2013)

Lack of technical support for repairs and maintenance of ICT facilities:-

Becta (2004) stated that if there is lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns. Technical problems according to Sicilia (2005) include waiting for websites to open, failing to connect to the internet, printers not printing, malfunctioning computers, and teachers having to work on old computers. Technical barriers according to Sicilia impede the smooth delivery of lesson or the natural flow of the classroom activity and argued that whatever kind of technical support and access teaching staff have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth delivery of lesson by teachers.

According to Gomes (2005), ICT integration in science teaching needs a technician and if one is not available the lack of technical support can be an obstacle. According to Tella et al. (2007) technical support and lack of expertise in using ICT was indicated as being the prominent factors hindering teachers' readiness and confidence of using ICTs during lesson. Although teachers had a strong desire to use ICT in the classroom, they were encountered with some barriers of insufficient technical supports at schools (Salehi and Salehi, 2012).

Inadequate ICT manpower in schools:-

According to Goshit (2006), the main problem facing Nigeria and its ICT programme is workforce training of which teaching as a profession in Nigeria is considered to be for poor people, therefore the few professional that are available prefer to work in companies and industries where they can earn better salaries. With this deplorable condition, teachers are not motivated to go the extra mile in assisting the students to acquire computer education (Oduroye, n.d). There is also inadequacy of well qualified personnel to train others and repair the broken down computers for continuity, progress and well being of Nigerian teachers and students in general (Mohammed and Yarinchi, 2013). Osakwe (2012) observes also that there is lack of qualified personnel in Nigeria Secondary schools to manage available systems, develop and use information communication technology facilities for the teaching-learning process and posits that in schools where qualified personnel exist, they lack skills in designing and delivering courses and lectures in electronic formats. Ibadin (2001) argue that there is acute shortage of well trained ICT handlers in secondary schools. There is lack of adequate trained manpower for the development, maintenance and operation of ICT facilities to service the increase demand of Information Technology services in Nigeria (Haruna, 2005).

Idowu and Esere (2013) also observed that most institutions lack computer literate teachers and ICT experts that would support and manage the internet connectivity or applications in the teaching and learning process. The demand for ICT learning has been tremendous and the number of teachers who are trained to teach ICT cannot meet the demand as there are more students willing to be taught computing skills than there are teachers to transfer the skills (Mungai, 2011).

Poor remuneration for teachers:-

Haruna (2005) observes that poor remuneration for teachers keeps the inadequate personnel in ICT consequently away from labour markets in Nigeria. Mohammed and Yarinchi (2013) states that financial constraint is one of the major problem confronting teaching and learning process in modern Nigeria, with particular reference to ICT that two-third of teachers and students in their study proved that they do not have money to purchase computers.

Nonchallant or improper attention of the Nigerian Government towards the development of ICT sector:-

There is nonchalant or improper attention of the Nigerian government ranging from local government councils, state and federal governments to financially motivate teaching staff at whatever education levels, through provision of computer to them on loan basis and subsidized rate (Mohammed and Yarinchi, 2013). Haruna (2005) observed also that there is lack of total commitment on the part of government towards the development of ICT sector. Albirini (2006) observed that the attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the internet and procurement of computers is rather slow in some instances, and in some others there are no aids or support by the government at all.

Poor perception of ICTs among teachers, administrators and community leaders:-

There is widespread ignorance and misconception about ICTs amongst Nigerians (Ighoroje and Ajayi, n.d). One of the major constraints to Nigeria fully embracing ICTs is the average Nigerian's general lack of exposure to them. For most Nigerians, information technology is still something unfamiliar, distant, and mysterious. Rather than being seen as a tool for personal and national development, information technology is seen as a hurdle (NITDA, 2003).

Some Nigerians (including teachers) are not aware of the existence and importance of the Internet (Adomi, Okiy, and Ruteyan, 2003). There is lack of adequate knowledge among teachers, educational planners, administrators as well as the society on the importance of ICT in educational system (Haruna, 2005). There is still a strong perception especially by the older generation that computers require highly skilled personnel to operate, while this may not be the case, even the community leaders who are charged with looking at the interests of a given community do not see the need to purchase computers for their schools as a priority considering health care, provision of water and other amenities as more important than buying computers for their schools (Mungai, 2011). There is poor management on the parts of school administrators and government (Adomi and Kpangban, 2010).

Inadequate funding of educational sector:-

Gbadamosi (2006) notes that inadequate funding is a major challenge that has negatively affected many areas of education in Nigeria. Areas it has affected include funding of ICT projects, training and retraining of teachers, provision of technological infrastructure, development and maintenance of software packages and electricity. Osakwe (2012) further assert that the current level of funding in Nigeria with reduced budgetary allocation to the

education sector is a major constraint in the provision of ICT equipment (computers, its' accessories, software packages and maintenance). Moreso, with the slogan of global economic 'melt down', available funds are used to satisfy other vital needs instead of investing them in ICT development in secondary schools. The overall educational system is underfunded therefore available funds are used to solve more urgent and important survival needs by institutions (Taiwo, 2004). The over dependence of educational institutions on government for everything has limited institutional ability to collaborate with the private sector or seek alternative funding sources for ICT educational initiatives (Yusuf, 2005).

Insufficient Teaching Time:-

Several studies indicate that many teachers have competence and confidence in using computers in the classroom, but they still make little use of technologies because they do not have enough time (Khalid, 2009). According to Sicilia (2005), the most common challenge reported by all the teachers was the lack of time they had to plan technology lessons, explore the different internet sites or look at various aspects of educational software. Teachers interviewed by Sicilia, commented that the constraints of different class schedule contributed to the lack of time they spent to work on planning classroom activities.

Similarly, in Canada, Sicilia concluded that teachers take much more time to design projects that include the use of new ICT than to prepare traditional lessons. Becta (2004) also observed that the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks, with some of the participant teachers specifically stating which aspects of ICT require more time which include the time needed to locate internet advice, prepare lessons, explore and practice using the technology, deal with technical problems, and receive adequate training. Gomes (2005) concluded that one of the main reasons that science teachers do not use ICT in the classroom is lack of the time to accomplish plans.

Implementation of ICT requires large capital investments:-

Hennesy (2010) observes that one of the greatest challenges in implementation of ICT in schools is balancing educational goals with economic realities. This is so because implementation of ICT requires large capital investments, schools need to be prudent in making decisions about what models of ICT will be implemented and be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added by implementing ICT offsets the cost, relative to the cost of alternatives. The challenges of ICT usage may not be fund nor the technology but rather the will on the part of government and/or the governors of education (Itegbaje and Okubote, 2002)

Problem of over dependence on fairly used computers:-

The problem of over dependence on fairly imported computers is another obstacle and serious challenge confronting teaching and learning process in Nigeria as our Indigenous Nigerian engineers as fund incapable of manufacturing computers (Mohammed and Yarinchi, 2013). Obsolete computer lowers the morale of both teacher and student as it is very common to see schools using very old computers (Mungai, 2011).

Over dependence of educational institutions on government for everything:-

The over dependence of educational institutions on government for everything has limited institutional ability to collaborate with the private sector or seek alternative funding sources for ICT educational initiatives (Yusuf, 2005).

Limited/poor information infrastructure:- lack of adequate search skills and of access points were reported as factors inhibiting the use of the internet by secondary school teachers in their schools (Kaku, 2005). ICT development and application are not well established in Nigeria because of poor information infrastructure (Adomi, 2006; Adomi, 2005a; Adomi, Forthcoming b; Adomi, Forthcoming a; Aginam, 2006). According to Southwood (2004) more than 40 percent of the population of Africa is in areas not covered by telecom services as a result schools located in such areas will experience ICT connectivity problems. Idowu and Esere (2013) also observe that most of the ICT infrastructures such as internet, telefax, e-mail are dependent on NITEL (Nigerian Telecommunications Limited), NIPOST (Nigerian Postal Agency) and PHCN (Power Holding Corporation of Nigeria) services. These services are epileptic in delivery and attract unbearably high bills and that Nigeria lacks the necessary infrastructural facilities to benefit from ICT.

Large class size:-

According to Federal republic of Nigeria (2004) the teacher-student's ratio for effective participation of students in practical work in technical college shall be kept at 1:20 whereas the teacher-pupil ratio at senior secondary school level shall be 1:40 (Federal Republic of Nigeria, 2009). This is quite unhealthy for practical activities. Also senior secondary schools in Nigeria are more populated than relative technical colleges thereby making the goal of introducing ICT in senior secondary schools quite unrealistic (Okoye and Ogunleye, 2015).

Lack of basic facilities:-

In every educational system, certain basic facilities are required. The National Policy on Education (2004) posits that the government shall provide facilities and necessary infrastructure for the promotion of ICT at all levels of education. However, in secondary schools, there is inadequate or non-existence of physical facilities and material resources such as computer rooms, furniture, electricity or electric generators (Gbadamosi, 2006). ICTs do require supporting physical infrastructures to be in place before they can be implemented however, for many schools in developing countries there is seldom free room and in some schools, no suitable building at all thus several researchers and authors have argued that lack of physical educational facilities like buildings, is the major hindrance to the implementation of ICT in Africa (Hennesy, 2010). There are limited resources to equip schools with ICT infrastructure and this has been a barrier in implementation of ICT to support curriculum delivery also standard software for use in schools for learning and administration are not widely available (Aguyo, 2010). Idowu and Esere (2013) also reported inadequate ICT infrastructure including computer hardware and software and bandwidth access

Poor ICT policy/project implementation strategy:-

The Nigerian Federal Government's 1988 policy introduced computer education to the high schools (Okebukola, 1997). The only way this policy was implemented was the distribution of computers to federal government high schools, which were never used for computer education of the students. No effort was made to distribute computer to state government or private schools. Although the government planned to integrate ICTs into the school system and provide schools with infrastructure, concerted efforts have not been made to provide facilities and trained personnel. Thus, most schools do not yet offer ICT training programmes (Goshit, 2006). While all countries in the region acknowledge the strategic role of ICTs in development, only a few have established a comprehensive policy. When such policies exist, they tend to remain unclear and make little reference to implementation (James, 2001, cited by Evoh, 2007). There is lack of well articulated educational policy by the Nigerian government of which more attention is given to other sectors than to education thus posing problems to the development of ICT education in secondary schools (Osakwe, 2012).

Resistance to change by teachers:-

Idowu and Esere (2013) states that there is a resistance to change by both students and academics from traditional pedagogical methods to more innovative, technology-based teaching and learning methods. Mohammed and Yarinch (2013) states that there is problem of teaching and theoretical knowledge on ICT confronting teaching and learning process and is a barrier to the use of computer for the promotion of teaching and learning activities. Some other factors which were more internal to the teachers such as resistance to change and lack of awareness of the benefits of the ICTs for learning were reported as barriers (Pelgrum, 2001). A study by Higgins, & Moseley (2011) revealed that inability of teachers to understand why they should implement ICT in teaching and how exactly to implement was an impediment to its implementation. They assert that Unfortunately, many teachers' training institutions in Africa continue to teach more about what is ICT rather than teaching how to use it during teaching and learning in classroom. As rightly observed by Ojo (2005), the corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT. It becomes a difficult problem for these set of teachers to acquire adequate mastery of skills and content that are embedded in ICT. Haruna (2005) states that there is lukewarm attitude of many teachers especially at the primary and secondary school levels to be computer literate and that the capacity building of teachers in ICT is very low

Lack of interest by student:-

Computer Studies/ICT was introduced alongside four other subjects as one of the trade subjects in the new curriculum for senior secondary schools. Okoye and Ogunleye (2015) observed that the trade subjects are not relevant for admission into higher institutions hence it does not carry weight as expected. Findings revealed that factors like lack of interest by students in learning computer science militate against the teaching of computer science (UNIPROJECTS, 2015).

Several studies have reported relationships between demographic characteristics of teachers and their reported use of technologies which include age, gender, race, education level, socio-economic status of students taught, years of teaching, years of technology use, (Becker, 2004; Ely, 1999; Hadley & Sheingold, 1993; Jaber & Moore, 1999).

Empirical Studies:-

Tella, Oluwole, Toyobo, Adika, and Adeyinka (2007) in a study of assessment of secondary school teachers' uses of ICTs in Nigerian Secondary schools through census drawn on 700 teachers from twenty five purposefully selected private secondary schools in Ibadan, Oyo state, Nigeria comprising 430 males and 270 females aged ranging from 25-45 years with a mean age of 35 years revealed that teachers generally have access to ICTs in their various schools except e-mail and Internet because their schools are not connected. The result showed that technical support are lacking in their schools and teachers lack of expertise in using ICT was indicated as being the prominent factors hindering teachers readiness and confidence of using ICTs during lesson.

Adomi and Kpangan (2010) findings to the factors associated with low rate of ICT adoption and application in Nigerian Secondary Schools as perceived by 176 teachers in two states of Nigeria among 9 schools in Edo State with 84 respondents and 6 schools in Delta State with 92 respondents. Of the 176 teachers, 97 were male and 77 female. The findings revealed that the low rate of ICT adoption and application in Nigeria secondary schools is attributable to several factors which includes limited/poor information infrastructure, lack of/inadequate ICT facilities in schools, frequent electricity interruption, poor ICT policy/project implementation strategy, Inadequate ICT in the schools, High cost of ICT facilities/components, limited school budget, lack of/limited ICT skills among teachers and administrators, inadequate educational software, poor management on the parts of school administrators and government, lack of maintenance culture and lack of interest in ICT application/use on the part of students.

Salehi and Salehi (2012) investigation on teachers' perceptions of the challenges for using ICT in education among 30 high school English teacher who were selected from the five main educational districts in the city of Isfahan, Iran revealed that although teachers had a strong desire to use ICT in the classroom, they were encountered with some barriers which include insufficient technical supports at schools and little access to Internet and ICT were considered as the major barriers preventing teachers to integrate ICT into the curriculum. Moreover, the descriptive analysis of their result showed that shortage of class time was another significant barrier discouraging teachers to use ICT into the classroom.

Sabina, (2012) empirical research study which investigated into the challenges in the application of e-learning in secondary schools in Onitsha North LGA, Anambra state, Nigeria, among two hundred and twenty-five (225) teachers in public secondary schools findings revealed acute shortage of e-learning materials such as on-line/internet connected computers, e-mail facilities, multimedia television, multimedia computer and digital library. It was also revealed that the few available ones such as off-line/ordinary computers, scanners, printer and ready-made courseware are not utilized because the teachers lack the knowledge and skills of computer application.

Evoh (2007) observes that despite the recognized role of ICTs in improving education, ICTs remain a low financial priority in most educational systems in Africa. He further observes that most countries in the region lack resources for a sustainable integration of ICTs in education, and that African countries face numerous competing development priorities. These range from budgetary constraints, management challenges, and shortage of teachers and other educational resources.

Khalid, (2009) in a study in Science Education in Australia on the barriers to the successful integration of ICT in teaching and learning environments identified that teachers had a strong desire to integrate ICT into education, but that they encountered many barriers which include lack of confidence, lack of competence, and lack of access to resources.

Research Questions:-

The following research questions directed the study:

1. What are the constraints in the use of ICT in teaching in Senior Secondary Schools?
2. What are the constraints of male teachers in the use of ICT in teaching in Senior Secondary Schools?
3. What are the constraints of female teachers in the use of ICT in teaching in Senior Secondary Schools?
4. What are the constraints of urban teachers in the use of ICT in teaching in Senior Secondary Schools?

5. What are the constraints of rural teachers in the use of ICT in teaching in Senior Secondary Schools?
6. What are the constraints of experienced teachers in the use of ICT in teaching in senior secondary schools?
7. What are the constraints of less experienced teachers in the use of ICT in teaching in senior secondary schools?
8. What are the constraints of qualified teachers in the use of ICT in teaching in senior secondary schools?
9. What are the constraints of non qualified teachers in the use of ICT in teaching in senior secondary schools?

Hypotheses:-

The following hypotheses were formulated to guide the study:

HO₁:-There is no significant difference in the constraints of the use of ICT in teaching between male and female teachers in senior secondary schools.

HO₂:-There is no significant difference in the constraints of the use of ICT in teaching between urban and rural teachers in senior secondary schools.

HO₃:-There is no significant difference in the constraints of the use of ICT in teaching between experienced teachers and less experienced teachers in senior secondary schools.

HO₄:-There is no significant difference in the constraints of the use of ICT in teaching between qualified teachers and non qualified teachers in senior secondary schools.

Method:-

Design of the Study:-

The researcher employed the descriptive survey research design for this investigation. This method was adopted because it enabled the researcher to be able to interact with participants in their different stratified locations. It is also an ex-post-facto study.

Egbule and Okobia (2001) agreed to the use of descriptive survey research design, noting that it could be used to generate data from external factors on the issue such as being investigated in this study. Therefore, through this method, the researcher was able to interact with teachers who are respondents considered for the investigation and was able to draw the necessary information from them for the interpretation of the teachers' constraints in the use of ICT in teaching in Bayelsa State.

Population of the Study:-

The population of this study consisted of all the Public Senior Secondary School Computer Studies teachers in Bayelsa West Senatorial district which is made up of teachers in Ekeremor Local Government Area and Sagbama Local Government Area. It consists of 116 teachers in 41 schools, Ekeremor LGA with 56 teachers having 20 schools and Sagbama LGA with 60 teachers having 21 schools. Thus, this figure constituted the population of the study (**Source:** Bayelsa State Post Primary Schools Board, Yenagoa , 2016).

Sample and Sampling Technique:-

The researchers employed the simple random sampling of balloting and a proportionate stratified procedure which involves the use of an appropriate percentage in the procedure in the selection of proportionate number of schools and participants from the two Local Government Areas. Ninety percent was utilized to randomly draw the numbers of teachers from the total figure of 116 teachers to arrive at 104 participants while 95% was used in the sampling of total number of schools of 41, giving an approximate sum of 39 schools involved in the investigation.

The selection considers the two Local Government Areas in Bayelsa West Senatorial District that the study is situated. It implies that 104 Computer Studies teachers were randomly drawn from a population of 116 Computer Studies teachers in 39 Senior Secondary Schools in Ekeremor and Sagbama LGA through Proportionate Stratified Procedure. See Table 2, appendix II.

Instrument of the Study:-

In order to collect data for the study, the researchers employed the questionnaire as the instrument. The questionnaire is titled: Constraints in the Use of Information and Communication Technology in Teaching Questionnaire (CUICTTQ). The questionnaire was designed to seek information and opinions from teachers about their constraints in the use of ICT in teaching in Senior Secondary Schools in Bayelsa State.

The instrument consisted of two sections – A and B. Section A sought information on the respondents (teachers) Socio-demographic variables which includes Name of school, Local Government Area of Origin, Location, Gender,

Years of experience and Qualification While section B consists of 25 items designed in line with the constraints observed in the study.

The items developed as contained in the questionnaire were used to generate the appropriate data with which to answer the research questions raised alongside the formulated hypotheses for the study. Responses of participants were based on four-point Likert scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1).

Validity of the Instrument:-

The research instrument was examined for face, content and construct validity. The researcher established the face and content validity of the instrument on the basis of expert judgement of the items. Their expertise was brought to bear on the questionnaire, in ensuring that the questionnaire was relevant, clear and unambiguous.

In order to determine the construct validity, the factor analysis method was used. For example, using factor analysis, the factor loadings matrix ranged from .632 to .910 in all the items. Therefore, the instrument was considered to have construct validity.

Reliability of the Instrument:-

The Cronbach Alpha method was used to obtain the reliability of the instrument. Thirty participants were randomly drawn from school teachers not listed for the actual study to respond to the questionnaire items. Further, data generated from the responses to the questionnaire items were statistically analyzed using Cronbach Alpha. A coefficient of 0.827 was retained. The statistical measure enabled the researcher to verify the reliability coefficient of the study

Method of Data Collection:-

Administration of the questionnaire was carried out in the listed schools and among Computer Studies teachers. Thus, to facilitate the return of copies, the researcher personally visited the respondents in the sampled schools with two research assistants. This enabled the researcher to retrieve the completed copies of the instrument the same day.

Method of Data Analysis:-

The retrieved copies of the questionnaire were scored and separated into various categories as stated in section A. The completed copies of the questionnaire were scored as dummy variables. For example, Urban was assigned = 1 and Rural was assigned = 2 in Location. The same goes for Sex (Male = 1 and Female = 2), Experience level (below 10 years = 2 and above 10 years = 1), and Qualification (Non Qualified = 2 and Qualified = 1). All research questions were answered using mean while all 4 hypotheses were tested with t-test statistics at 0.05 level of significance. A mean of 2.50 was taken as the bench-mark. That is, a mean of 2.50 and above was considered high and taken as acceptance of constraints in the use of ICT in teaching while a mean below 2.50 was considered low and taken as rejection of constraints in the use of ICT in teaching.

Results:-

Research Question 1:-

What are the constraints in the use of ICT in teaching in Senior Secondary Schools?

Table 1:-Respondents Mean Rating of the Constraints in the Use of ICT in Teaching in Senior Secondary Schools

S/N	Items	N = 104 BENCHMARK = 2.50		
		Total Score	Mean	Decision
1.	Insufficient computers	389	3.74	High
2.	Insufficient ICT facilities	386	3.71	High
3.	Poor remuneration for teachers	383	3.68	High
4.	Inadequate funding of educational sector	383	3.68	High
5.	Lack of basic facilities (computer rooms, furniture's, electric generator)	383	3.68	High
6.	Implementation of ICT requires large capital investment	371	3.57	High
7.	Inadequate ICT manpower in schools (qualified teachers to teach)	370	3.56	High

8.	Insufficient ICT training opportunities for teachers	369	3.55	High
9.	Poor ICT policy/project implementation strategy	369	3.55	High
10.	Lack of technical support for repairs and maintenance of ICT facilities	367	3.53	High
11.	High price of computers/ICT facilities	358	3.44	High
12.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	356	3.42	High
13.	Over dependence of educational institutions on government for everything	355	3.41	High
14.	Problem of over dependence on fairly used computers	350	3.37	High
15.	Poor power supply	350	3.37	High
16.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional old system of education	348	3.35	High
17.	Poor perception of ICTs among community leaders	347	3.34	High
18.	Limited/Poor information infrastructure	345	3.32	High
19.	Poor perception of ICTs among administrators	341	3.28	High
20.	Insufficient teaching time	338	3.25	High
21.	Lukewarm attitude of many teachers to be computer literate	327	3.14	High
22.	Poor perception of ICTs among teachers	314	3.02	High
23.	Computer studies is not a core subject	310	2.98	High
24.	Lack of interest by students	308	2.96	High
25.	Large class size	307	2.95	High

In table 4.1 above, based on average mean benchmark of 2.5 shows the responses of the subjects on the items from the highest to the lowest. The data revealed that all the twenty five items were regarded as constraints to the use of ICT in teaching in Senior Secondary Schools with mean ranging from 2.95 - 3.74. They are insufficient computers which ranked highest (3.74), insufficient ICT facilities ranked second (3.71), poor remuneration for teachers, inadequate funding of educational sector and lack of basic facilities ranked third (3.68), implementation of ICT requires large capital investment ranked sixth (3.57), inadequate ICT manpower in schools rank seventh (3.56), insufficient training opportunities and poor ICT policy rank eight (3.55), lack of technical support ranked ten (3.53), high price of ICT facilities ranked eleven (3.44), improper attention of the Nigerian Government rank twelve (3.42), over dependence of educational institutions on government for everything ranked thirteen (3.41), dependence on fairly used computers and poor power supply ranked fourteen (3.37), most teachers went through traditional system of education ranked sixteen (3.35), poor perception of ICT among community leaders ranked seventeen (3.34), poor information infrastructure ranked eighteen (3.32), poor perception of ICT among administrators ranked nineteen (3.28), insufficient teaching time ranked twenty (3.25), lukewarm attitude of many teachers to be computer literate ranked twenty one (3.14), poor perception of ICTs among teachers ranked twenty two (3.02), computer studies is not a core subject ranked twenty three (2.98), lack of interest by students ranked twenty four (2.96) and large class size ranked the least of twenty five (2.95).

Research Question 2:-

What are the constraints of male teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.2a:-Analysis of the Mean Rating of Male Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 63 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Insufficient computers	237	3.76	High
2.	Insufficient ICT facilities.	236	3.75	High
3.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	236	3.75	High
4.	Inadequate funding of educational sector	232	3.68	High
5.	Poor ICT policy/project implementation strategy	230	3.65	High
6.	Poor remuneration for teachers	229	3.63	High

7.	Implementation of ICT requires large capital investment	227	3.60	High
8.	Lack of technical support for repairs and maintenance of ICT facilities	225	3.57	High
9.	Insufficient ICT training opportunities for teachers	222	3.52	High
10.	Inadequate ICT manpower in schools (qualified teachers to teach)	222	3.52	High
11.	Over dependence of educational institutions on government for everything	222	3.52	High
12.	Problem of over dependence on fairly used computers	221	3.51	High
13.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	220	3.49	High
14.	Poor power supply	219	3.48	High
15.	Limited/Poor information infrastructure	219	3.48	High
16.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	218	3.46	High
17.	High price of Computers/ICT facilities	215	3.41	High
18.	Poor perception of ICTs among administrators	213	3.38	High
19.	Poor perception of ICTs among community leaders	211	3.35	High
20.	Insufficient Teaching Time	207	3.29	High
21.	Lukewarm attitude of many teachers to be computer literate	203	3.22	High
22.	Large class size	196	3.11	High
23.	Poor perception of ICTs among teachers	195	3.10	High
24.	Lack of interest by student	194	3.08	High
25.	Computer Studies (ICT) is not a core subject	184	2.92	High
Total Grand Mean			3.45	

Table 4.2a above, revealed male teachers' responses on the constraints in the use of ICT in teaching in senior secondary schools with a total grand mean of 3.45. The results in the table showed that male teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 2.92 – 3.76. For the male computer studies teachers, Insufficient computers ranked highest (3.76), Insufficient ICT facilities and Lack of basic facilities second (3.75), Inadequate funding of educational sector fourth (3.68), Poor ICT policy/project implementation strategy fifth (3.65), Poor remuneration for teachers sixth (3.63), Implementation of ICT requires large capital investment seventh (3.60), Lack of technical support for repairs and maintenance of ICT facilities eight (3.57), Insufficient training opportunities for teachers, Inadequate ICT manpower in schools and Over dependence on educational institutions on government for everything ranked nine (3.52), Problem of over dependence on fairly used computers ranked twelve (3.51), Most teachers went through traditional system of education thirteen (3.49), Poor power supply and Limited/poor information infrastructure ranked fourteen (3.48), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector sixteen (3.46), High price of computers/ICT facilities seventeen (3.41), Poor perception of ICTs among administrators eighteen (3.38), Poor perception of ICTs among community leaders nineteen (3.35), Insufficient teaching time twenty (3.29), Lukewarm attitude of many teachers to be computer literate twenty one (3.22), Large class size twenty two (3.11), Poor perception of ICTs among teachers twenty three (3.10), Lack of interest by student twenty four (3.08) and lastly, Computer studies is not a core subject ranked least (2.92).

Research Question 3:-

What are the constraints of female teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.2b:-Analysis of the Mean Rating of Female Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 41 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Poor remuneration for teachers	154	3.76	High
2.	Insufficient computers	152	3.71	High

3.	Inadequate funding of educational sector	151	3.68	High
4.	Insufficient ICT facilities.	150	3.66	High
5.	Inadequate ICT manpower in schools (qualified teachers to teach)	148	3.61	High
6.	Insufficient ICT training opportunities for teachers	147	3.59	High
7.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	147	3.59	High
8.	Implementation of ICT requires large capital investment	144	3.51	High
9.	High price of Computers/ICT facilities	143	3.49	High
10.	Lack of technical support for repairs and maintenance of ICT facilities	142	3.46	High
11.	Poor ICT policy/project implementation strategy	139	3.39	High
12.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	138	3.37	High
13.	Poor perception of ICTs among community leaders	136	3.32	High
14.	Over dependence of educational institutions on government for everything	133	3.24	High
15.	Poor power supply	131	3.20	High
16.	Insufficient Teaching Time	131	3.20	High
17.	Problem of over dependence on fairly used computers	129	3.15	High
18.	Poor perception of ICTs among administrators	128	3.12	High
19.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	128	3.12	High
20.	Computer Studies (ICT) is not a core subject	126	3.07	High
21.	Limited/Poor information infrastructure	126	3.07	High
22.	Lukewarm attitude of many teachers to be computer literate	124	3.02	High
23.	Poor perception of ICTs among teachers	119	2.90	High
24.	Lack of interest by student	114	2.78	High
25.	Large class size	111	2.71	High
	Total Grand Mean		3.31	

Table 4.2b above, revealed female teachers' responses on the constraints in the use of ICT in teaching in Senior Secondary Schools with a total grand mean of 3.21. The results in the table showed that female teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 2.71 – 3.76. For the female teachers, Poor remuneration for teachers ranked highest (3.76), Insufficient computers second (3.71), Inadequate funding of educational sector third (3.68), Insufficient ICT facilities fourth (3.66), Inadequate ICT manpower in schools fifth (3.61), Insufficient training opportunities for teachers and Lack of basic facilities ranked sixth (3.59), Implementation of ICT requires large capital investment eight (3.51), High price of computers/ICT facilities nine (3.49), Lack of technical support for repairs and maintenance of ICT facilities ten (3.46), Poor ICT policy/project implementation strategy eleven (3.39), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector twelve (3.37), Poor perception of ICTs among community leaders thirteen (3.32), Over dependence on educational institutions on government for everything fourteen (3.24), Poor power supply and Insufficient teaching time ranked fifteen (3.20), Problem of over dependence on fairly used computers seventeen (3.15), Poor perception of ICTs among administrators and Most teachers went through traditional system of education ranked eighteen (3.12), Computer studies is not a core subject and Limited/poor information infrastructure ranked twenty (3.07), Lukewarm attitude of many teachers to be computer literate twenty two (3.02), Poor perception of ICTs among teachers twenty three (2.90), Lack of interest by student twenty four (2.78) and the least is Large class size which ranked twenty five (2.71)

Research Question 4:-

What are the constraints of urban teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.3a:-Analysis of the Mean Rating of Urban Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 38 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Poor remuneration for teachers	143	3.76	High
2.	Inadequate funding of educational sector	143	3.76	High
3.	Insufficient computers	140	3.68	High
4.	Inadequate ICT manpower in schools (qualified teachers to teach)	136	3.58	High
5.	Implementation of ICT requires large capital investment	136	3.58	High
6.	Insufficient ICT facilities.	135	3.55	High
7.	Lack of technical support for repairs and maintenance of ICT facilities	135	3.55	High
8.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	134	3.53	High
9.	Insufficient ICT training opportunities for teachers	133	3.50	High
10.	High price of Computers/ICT facilities	132	3.47	High
11.	Poor ICT policy/project implementation strategy	128	3.37	High
12.	Over dependence of educational institutions on government for everything	123	3.24	High
13.	Problem of over dependence on fairly used computers	123	3.24	High
14.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	122	3.21	High
15.	Insufficient Teaching Time	121	3.18	High
16.	Poor perception of ICTs among community leaders	120	3.16	High
17.	Computer Studies (ICT) is not a core subject	117	3.08	High
18.	Limited/Poor information infrastructure	116	3.05	High
19.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	116	3.05	High
20.	Poor perception of ICTs among administrators	114	3.00	High
21.	Lack of interest by student	110	2.89	High
22.	Poor perception of ICTs among teachers	109	2.87	High
23.	Lukewarm attitude of many teachers to be computer literate	109	2.87	High
24.	Large class size	106	2.79	High
25.	Poor power supply	97	2.55	High
Total Grand Mean			3.26	

Table 4.3a above, revealed urban teachers' responses on the constraints in the use of ICT in teaching in Senior Secondary Schools with a total grand mean of 3.26. The results in the table showed that urban teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 2.55 – 3.76. For the urban computer studies teachers, Poor remuneration for teachers and Inadequate funding of educational sector ranked highest (3.76), Insufficient computers ranked third (3.68), Inadequate ICT manpower in schools and Implementation of ICT requires large capital investment ranked fourth (3.58), Insufficient ICT facilities and Lack of technical support for repairs and maintenance of ICT facilities ranked sixth (3.55), Lack of basic facilities eight (3.53), Insufficient training opportunities for teachers nine (3.50), High price of computers/ICT facilities ten (3.47), Poor ICT policy/project implementation strategy eleven (3.37), Over dependence on educational institutions on government for everything and Problem of over dependence on fairly used computers ranked twelve (3.24), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector fourteen (3.21), Insufficient teaching time fifteen (3.18), Poor perception of ICTs among community leaders sixteen (3.16), Computer studies is not a core subject seventeen (3.08), Limited/poor information infrastructure and Most teachers went through traditional system of education ranked eighteen (3.05), Poor perception of ICTs among administrators twenty (3.00) , Lack of interest by student twenty one (2.89), Poor perception of ICTs among teachers and

Lukewarm attitude of many teachers to be computer literate ranked twenty two (2.87), Large class size ranked twenty four (2.79) and lastly Poor power supply ranked the least twenty fifth (2.55).

Research Question 5:-

What are the constraints of rural teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.3b:-Analysis of the Mean Rating of Rural Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 66 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Poor power supply	253	3.86	High
2.	Insufficient ICT facilities.	251	3.80	High
3.	Insufficient computers	249	3.77	High
4.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	249	3.77	High
5.	Poor ICT policy/project implementation strategy	241	3.65	High
6.	Poor remuneration for teachers	240	3.64	High
7.	Inadequate funding of educational sector	240	3.64	High
8.	Insufficient ICT training opportunities for teachers	236	3.58	High
9.	Implementation of ICT requires large capital investment	235	3.56	High
10.	Inadequate ICT manpower in schools (qualified teachers to teach)	234	3.55	High
11.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	234	3.55	High
12.	Over dependence of educational institutions on government for everything	232	3.52	High
13.	Lack of technical support for repairs and maintenance of ICT facilities	232	3.52	High
14.	the corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	232	3.52	High
15.	Limited/Poor information infrastructure	229	3.47	High
16.	Poor perception of ICTs among administrators	227	3.44	High
17.	Poor perception of ICTs among community leaders	227	3.44	High
18.	Problem of over dependence on fairly used computers	227	3.44	High
19.	High price of Computers/ICT facilities	226	3.42	High
20.	Lukewarm attitude of many teachers to be computer literate	218	3.30	High
21.	Insufficient Teaching Time	217	3.29	High
22.	Poor perception of ICTs among teachers	206	3.12	High
23.	Large class size	201	3.05	High
24.	Lack of interest by student	198	3.00	High
25.	Computer Studies (ICT) is not a core subject	193	2.92	High
	Total Grand Mean		3.47	

Table 4.3b above shows rural computer studies teachers' responses on the constraints in the use of ICT in teaching in senior secondary schools with total grand mean of 3.47. The results in the table showed that the rural teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 2.92 – 3.86. For the rural computer studies teachers, Poor electricity supply ranked highest (3.86), Insufficient ICT facilities second (3.80), Insufficient computers and Lack of basic facilities third (3.77), Poor ICT policy/project implementation strategy fifth (3.65), Poor remuneration for teachers and Inadequate funding of educational sector sixth (3.64), Insufficient training opportunities for teachers eight (3.58), Implementation of ICT requires large capital investment nine (3.56), Inadequate ICT manpower in schools and Nonchalant or improper attention of the Nigerian government towards the development of ICT sector ten (3.55), Lack of technical support for repairs and maintenance of ICT facilities, Over dependence on educational institutions on government for everything and Most teachers went through traditional

system of education ranked twelve (3.52), Limited/poor information infrastructure fifteen (3.47), Poor perception of ICTs among administrators, Poor perception of ICTs among community leaders and Problem of over dependence on fairly used computers ranked sixteen (3.44), High price of computers/ICT facilities nineteen (3.42), Lukewarm attitude of many teachers to be computer literate twenty (3.30), Insufficient teaching time twenty one (3.29), Poor perception of ICTs among teachers twenty two (3.12), Large class size twenty three (3.05), Lack of interest by student twenty four (3.00) and lastly Computer studies is not a core subject ranked the least (2.92).

Research Question 6:-

What are the constraints of experienced teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.4a:-Analysis of the Mean Rating of Experienced Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 41 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Insufficient ICT facilities.	159	3.89	High
2.	Insufficient computers	158	3.85	High
3.	Poor remuneration for teachers	157	3.83	High
4.	Inadequate funding of educational sector	154	3.76	High
5.	Implementation of ICT requires large capital investment	151	3.68	High
6.	Inadequate ICT manpower in schools (qualified teachers to teach)	150	3.66	High
7.	High price of Computers/ICT facilities	150	3.66	High
8.	Lack of technical support for repairs and maintenance of ICT facilities	149	3.63	High
9.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	149	3.63	High
10.	Insufficient ICT training opportunities for teachers	148	3.61	High
11.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	147	3.59	High
12.	Over dependence of educational institutions on government for everything	147	3.59	High
13.	Poor ICT policy/project implementation strategy	147	3.59	High
14.	Poor perception of ICTs among administrators	146	3.56	High
15.	Problem of over dependence on fairly used computers	146	3.56	High
16.	Poor perception of ICTs among community leaders	145	3.54	High
17.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	145	3.54	High
18.	Insufficient Teaching Time	141	3.44	High
19.	Lukewarm attitude of many teachers to be computer literate	141	3.44	High
20.	Poor power supply	139	3.39	High
21.	Limited/Poor information infrastructure	138	3.37	High
22.	Poor perception of ICTs among teachers	137	3.34	High
23.	Lack of interest by student	135	3.29	High
24.	Large class size	131	3.20	High
25.	Computer Studies (ICT) is not a core subject	128	3.12	High
	Total Grand Mean		3.55	

Table 4.4a above, revealed experienced computer studies teachers constraints in the use of ICT in teaching in Senior secondary schools with a total grand mean of 3.55. The results in the table showed that experienced teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 3.12 – 3.89. For the experienced teachers, Insufficient ICT facilities ranked highest (3.89), Insufficient computers second (3.85), Poor remuneration for teachers third (3.83), Inadequate funding of educational sector fourth (3.76), Implementation of ICT requires large capital investment fifth (3.68), High price of computers/ICT facilities and Inadequate ICT manpower in

schools ranked sixth (3.66), Lack of technical support for repairs and maintenance of ICT facilities and Lack of basic facilities ranked eight (3.63), Insufficient training opportunities for teachers ten (3.61), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector, Over dependence on educational institutions on government for everything and Poor ICT policy/project implementation strategy ranked eleven (3.59), Poor perception of ICTs among administrators and Problem of over dependence on fairly used computers ranked fourteen (3.56), Poor perception of ICTs among community leaders and Most teachers went through traditional system of education ranked sixteen (3.54), Insufficient teaching time and Lukewarm attitude of many teachers to be computer literate ranked eighteen (3.44), Poor power supply twenty (3.39), Limited/poor information infrastructure twenty one (3.37), Poor perception of ICTs among teachers twenty two (3.34), Lack of interest by student twenty three (3.29), Large class size twenty four (3.20) and lastly Computer studies is not a core subject twenty fifth ranked least (3.12).

Research Question 7:-

What are the constraints of less experienced teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.4b:-Analysis of the Mean Rating of Less Experienced Teachers Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 63 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Lack of interest by student	236	3.75	High
2.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	234	3.71	High
3.	Insufficient computers	231	3.67	High
4.	Inadequate funding of educational sector	229	3.63	High
5.	Insufficient ICT facilities.	227	3.60	High
6.	Poor remuneration for teachers	226	3.59	High
7.	Poor ICT policy/project implementation strategy	222	3.52	High
8.	Insufficient ICT training opportunities for teachers	221	3.51	High
9.	Inadequate ICT manpower in schools (qualified teachers to teach)	220	3.49	High
10.	Implementation of ICT requires large capital investment	220	3.49	High
11.	Lack of technical support for repairs and maintenance of ICT facilities	218	3.46	High
12.	Poor power supply	211	3.35	High
13.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	209	3.32	High
14.	High price of Computers/ICT facilities	208	3.30	High
15.	Over dependence of educational institutions on government for everything	208	3.30	High
16.	Limited/Poor information infrastructure	207	3.29	High
17.	Problem of over dependence on fairly used computers	204	3.24	High
18.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	203	3.22	High
19.	Poor perception of ICTs among community leaders	202	3.21	High
20.	Insufficient Teaching Time	197	3.13	High
21.	Poor perception of ICTs among administrators	195	3.10	High
22.	Lukewarm attitude of many teachers to be computer literate	186	2.95	High
23.	Computer Studies (ICT) is not a core subject	182	2.89	High
24.	Poor perception of ICTs among teachers	177	2.81	High
25.	Large class size	176	2.79	High
	Total Grand Mean		3.29	

Table 4.4b above, revealed less experienced computer studies teachers' responses on the constraints in the use of ICT in teaching in Senior secondary schools with a total grand mean of 3.29. The results in the table showed that the less experienced teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of

2.79 – 3.75. For the less experienced teachers, Lack of interest by student ranked highest (3.75), Lack of basic facilities second (3.71), Insufficient computers third (3.67), Inadequate funding of educational sector fourth (3.63), Insufficient ICT facilities fifth (3.60), Poor remuneration for teachers sixth (3.59), Poor ICT policy/project implementation strategy seventh (3.52), Insufficient training opportunities for teachers eight (3.51), Inadequate ICT manpower in schools and Implementation of ICT requires large capital investment ranked nine (3.49), Lack of technical support for repairs and maintenance of ICT facilities eleven (3.46), Poor electricity supply twelve (3.35), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector thirteen (3.32), High price of computers/ICT facilities and Over dependence on educational institutions on government for everything fourteen (3.30), Limited/poor information infrastructure sixteen (3.29), Problem of over dependence on fairly used computers seventeen (3.24), Most teachers went through traditional system of education eighteen (3.22), Poor perception of ICTs among community leaders nineteen (3.21), Insufficient teaching time twenty (3.13), Poor perception of ICTs among administrators twenty one (3.10), Lukewarm attitude of many teachers to be computer literate twenty two (2.95), Computer studies is not a core subject twenty three (2.89), Poor perception of ICTs among teachers twenty four (2.81) and the least is Large class size which ranked twenty fifth (2.79).

Research Question 8:-

What are the constraints of qualified teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.5a:-Analysis of the Mean Rating of Qualified Teachers Constraints in the Use of ICT in Teaching in senior Secondary Schools.

	N = 42 Benchmark = 2.50			
S/N	ITEMS	Total Score	Mean	Decision
1.	Insufficient computers	155	3.69	High
2.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	155	3.69	High
3.	Insufficient ICT facilities.	153	3.64	High
4.	Inadequate funding of educational sector	152	3.62	High
5.	Poor power supply	148	3.52	High
6.	Insufficient ICT training opportunities for teachers	148	3.52	High
7.	Implementation of ICT requires large capital investment	147	3.50	High
8.	Poor ICT policy/project implementation strategy	146	3.48	High
9.	Lack of technical support for repairs and maintenance of ICT facilities	146	3.48	High
10.	Inadequate ICT manpower in schools (qualified teachers to teach)	144	3.43	High
11.	Poor remuneration for teachers	142	3.38	High
12.	Problem of over dependence on fairly used computers	142	3.38	High
13.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	141	3.36	High
14.	Over dependence of educational institutions on government for everything	141	3.36	High
15.	High price of Computers/ICT facilities	138	3.29	High
16.	The corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	137	3.26	High
17.	Limited/Poor information infrastructure	135	3.21	High
18.	Poor perception of ICTs among community leaders	130	3.10	High
19.	Poor perception of ICTs among administrators	129	3.07	High
20.	Lukewarm attitude of many teachers to be computer literate	128	3.05	High
21.	Insufficient Teaching Time	125	2.98	High
22.	Computer Studies (ICT) is not a core subject	122	2.90	High
23.	Poor perception of ICTs among teachers	117	2.79	High
24.	Large class size	113	2.69	High
25.	Lack of interest by student	109	2.60	High
	Total Grand Mean		3.28	

Table 4.5a above, revealed qualified teachers' responses on the constraints in the use of ICT in teaching in Senior Secondary Schools with a total grand mean of 3.28. The results in the table showed that qualified computer studies teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 2.60 – 3.69.

For the qualified computer studies teachers, Insufficient computers and Lack of basic facilities ranked highest (3.69), Insufficient ICT facilities third (3.64), Inadequate funding of educational sector fourth (3.62), Poor power supply and Insufficient training opportunities for teachers ranked fifth (3.52), Implementation of ICT requires large capital investment seventh (3.50), Lack of technical support for repairs and maintenance of ICT facilities and Poor ICT policy/project implementation strategy ranked eight (3.48), Inadequate ICT manpower in schools ten (3.43), Poor remuneration for teachers and Problem of over dependence on fairly used computers ranked eleven (3.38), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector and Over dependence on educational institutions on government for everything ranked thirteen (3.36), High price of computers/ICT facilities fifteen (3.29), Most teachers went through traditional system of education sixteen (3.26), Limited/poor information infrastructure seventeen (3.21), Poor perception of ICTs among community leaders eighteen (3.10), Poor perception of ICTs among administrators nineteen (3.07), Lukewarm attitude of many teachers to be computer literate twenty (3.05), Insufficient teaching time twenty one (2.98), Computer studies is not a core subject twenty two (2.90), Poor perception of ICTs among teachers twenty three (2.79), Large class size twenty four (2.69), and the least is Lack of interest by student which ranked twenty five (2.60).

Research Question 9:-

What are the constraints of non qualified teachers in the use of ICT in teaching in Senior Secondary Schools?

Table 4.5b:-Analysis of the Mean Rating of Non Qualified Teachers' Constraints in the Use of ICT in Teaching in Senior Secondary Schools.

		N = 62 Benchmark = 2.50		
S/N	ITEMS	Total Score	Mean	Decision
1.	Poor remuneration for teachers	241	3.89	High
2.	Insufficient computers	234	3.77	High
3.	Insufficient ICT facilities.	233	3.76	High
4.	Inadequate funding of educational sector	231	3.73	High
5.	Lack of basic facilities (computer rooms, furniture's, electricity or electric generator)	228	3.68	High
6.	Inadequate ICT manpower in schools (qualified teachers to teach)	226	3.65	High
7.	Implementation of ICT requires large capital investment	224	3.61	High
8.	Poor ICT policy/project implementation strategy	223	3.60	High
9.	Lack of technical support for repairs and maintenance of ICT facilities	221	3.56	High
10.	Insufficient ICT training opportunities for teachers	221	3.56	High
11.	High price of Computers/ICT facilities	220	3.55	High
12.	Poor perception of ICTs among community leaders	217	3.50	High
13.	Nonchalant or improper attention of the Nigerian Government towards the development of ICT sector	215	3.47	High
14.	Over dependence of educational institutions on government for everything	214	3.45	High
15.	Insufficient Teaching Time	213	3.44	High
16.	Poor perception of ICTs among administrators	212	3.42	High
17.	the corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT	211	3.40	High
18.	Limited/Poor information infrastructure	210	3.39	High
19.	Problem of over dependence on fairly used computers	208	3.35	High
20.	Poor power supply	202	3.26	High
21.	Lukewarm attitude of many teachers to be computer literate	199	3.21	High
22.	Lack of interest by student	199	3.21	High
23.	Poor perception of ICTs among teachers	197	3.18	High
24.	Large class size	194	3.13	High

25.	Computer Studies (ICT) is not a core subject	188	3.03	High
	Total Grand Mean		3.47	

Table 4.5b above, revealed non qualified computer studies teachers' responses on the constraints in the use of ICT in teaching in Senior secondary schools with a total grand mean of 3.47. The results in the table showed that the non qualified teachers agreed to items 1 to 25 as constraints to their use of ICT in teaching with a mean range of 3.03 – 3.89.

For the non qualified teachers, Poor remuneration for teachers ranked highest (3.89), Insufficient computers second (3.77), Insufficient ICT facilities third (3.76), Inadequate funding of educational sector fourth (3.73), Lack of basic facilities fifth (3.68), Inadequate ICT manpower in schools sixth (3.65), Implementation of ICT requires large capital investment seventh (3.61), Poor ICT policy/project implementation strategy eight (3.60), Insufficient training opportunities for teachers and Lack of technical support for repairs and maintenance of ICT facilities ranked nine (3.56), High price of computers/ICT facilities eleven (3.55), Poor perception of ICTs among community leaders twelve (3.50), Nonchalant or improper attention of the Nigerian government towards the development of ICT sector thirteen (3.47), Over dependence on educational institutions on government for everything fourteen (3.45), Insufficient teaching time fifteen (3.44), Poor perception of ICTs among administrators sixteen (3.42), Most teachers went through traditional system of education seventeen (3.40), Limited/poor information infrastructure eighteen (3.39), Problem of over dependence on fairly used computers nineteen (3.35), Poor electricity supply twenty (3.26), Lukewarm attitude of many teachers to be computer literate and Lack of interest by student ranked twenty one (3.21), Poor perception of ICTs among teachers twenty three (3.18), Large class size twenty four (3.13) and the least is Computer studies is not a core subject which ranked twenty five (3.03)

Hypotheses 1:-

There is no significant difference in the constraints of the use of ICT in teaching between male and female teachers in Senior Secondary Schools.

Table 2:-t-test analysis of no significant difference in the constraints of the use of ICT in teaching between male and female teachers in Senior Secondary Schools

Gender	N	Mean	Mean diff.	Std deviation	t	P	Decision
Male	63	3.4495	.14123	.39564	2.096	0.039	Significant
Female	41	3.3083		.29027			

Table 4.6 above showed a t-value of 2.096 with a p-value of 0.039 which is less than our alpha level of 0.05 chosen for this study. The hypotheses 1, which states that there is no significant difference in the constraints of the use of ICT in teaching between male teachers and female teachers is rejected. Thus, a significant difference exists in the constraints of ICT use in teaching between male and female teachers.

Hypotheses 2:-

There is no significant difference in the constraints of the use of ICT in teaching between urban and rural teachers in senior secondary schools.

Table 4.7:-t-test analysis of no significant difference in the constraints of the use of ICT in teaching between urban and rural teachers in senior secondary schools

Location	N	Mean	Mean diff.	Std deviation	t	P	Decision
Rural	66	3.4715	.21257	.40028	3.405	0.001	Significant
Urban	38	3.2589		.23632			

Table 4.7 above showed a t-value of 3.405 with a p-value of 0.001 which is less than our alpha level of 0.05 chosen for this study. The hypotheses 2, which states that there is no significant difference in the constraints of the use of ICT in teaching between urban teachers and rural teachers is therefore rejected. Thus, a significant difference exists in the constraints of ICT use in teaching between urban and rural teachers.

Hypotheses 3:-

There is no significant difference in the constraints of the use of ICT in teaching between experienced teachers and less experienced teachers in senior secondary schools

Table 3:-t-test analysis of no significant difference in the constraints of the use of ICT in teaching between experienced and less experienced teachers in senior secondary schools

Experience level	N	Mean	Mean diff.	Std deviation	t	P	Decision
Experienced	41	3.5493	.25657	.36299	3.738	0.000	Significant t
Less experienced	63	3.2927		.32787			

Table 4.8 above showed a t-value of 3.738 with a p-value of 0.0001 which is less than our alpha level of 0.05 chosen for this study. The hypotheses 3, which states that there is no significant difference in the constraints of the use of ICT in teaching between experienced teachers and non experienced teachers is thereby rejected. Thus, a significant difference exists in the constraints of ICT use in teaching between experienced and less experienced teachers.

Hypotheses 4:-

There is no significant difference in the constraints of the use of ICT in teaching between qualified teachers and non qualified teachers in senior secondary schools.

Table 4:-t-test analysis of no significant difference in the constraints of the use of ICT in teaching between qualified and non qualified teachers in senior secondary schools

Qualification	N	Mean	Mean diff.	Std deviation	t	P	Decision
Qualified	62	3.4716	.19257	.31514	2.830	0.006	Significant t
Non qualified	42	3.2790		.37482			

Table 4.9 above showed a t-value of 2.830 with a p-value of 0.006 which is less than our alpha level of 0.05 chosen for this study. The hypotheses 4, which states that there is no significant difference in the constraints of the use of ICT in teaching between qualified teachers and non qualified teachers is rejected. Thus, a significant difference exists in the constraints of ICT use in teaching between qualified and non qualified teachers.

Discussion:-

The study was guided by four null hypothesis formulated based on the variables in the study. In testing for the significant difference as stated, the t-test statistics at 0.05 level of significance were used and it was quite revealing that the entire four null hypotheses formulated for the study were rejected and it shows that there is a significant difference between male and female teachers, urban and rural teachers, experience and less experienced teachers, qualified and non qualified teachers and constraints of the use of ICT in teaching in Senior Secondary Schools in Bayelsa West Senatorial District.

The results in research question 2 and research question 3, Table 4.2a and table 4.2b on male and female teachers' constraints in the use of ICT in teaching, indicated that the grand mean was 3.45 and 3.31 respectively. This revealed that male teachers face higher constraints of ICT use in teaching than the female teachers.

Hypotheses one states that there is no significant difference in the constraints of the use of ICT in teaching among male and female teachers. The hypotheses was rejected and it is in line with Ilomaki (2008) which stressed that teachers' skills in using ICT in school are more heterogeneous that large majority of male teachers have sufficient skills for everyday and routine working practices but many of them still have difficulties in finding meaningful pedagogical use for technology and that there is still a small group of female teachers more often middle-aged and older females who lacked even basic ICT skills, concluding that ICT use in teaching is probably a question of motivation and interest. Also, Akinleye (2000) opined that attitude of female towards science and technology is a major challenge facing the development of science and technology in Nigeria stressing that in our Nigerian society

men are more competent, skilful, assertive, aggressive and able to get things done and that women on the other hand are warm and expensive, tactful, quiet, gentle, aware of others feelings and lacking competence, independence and logic.

Lalitha and Prased (2014) also revealed that differences exist between male and female teachers in using ICT were most male teachers have attended ICT training and taught with ICT but only few females have attended training or taught using ICT. Russel and Bradley (1997) also reported correlation between gender and computer anxiety were female teachers were reported to have a greater degree of anxiety than male teachers.

Toddman (2000) concluded that significant differences exist between males and female when observed for technical ICT capabilities and situational and longitudinal sustainability and stressed that the gender factor is an essential factor that affects the use of ICT in teaching. The Continuous breakdowns of ICT facilities hinders female teachers in using ICT smoothly. If there is any technical problem, they have to wait for the male teachers to fix the problem thus compounding more problems for the male teachers.

The results in research question 4 and research question 5, Table 4.3a and table 4.3b on urban and rural teachers' constraints in the use of ICT in teaching, indicated that the grand mean was 3.26 and 3.47 respectively. This revealed that rural teachers face higher constraints of ICT use in teaching than the urban teacher

Hypotheses two states that there is no significant difference in the constraint of the use of ICT in teaching among urban and rural teachers. The hypotheses was rejected and it is in line with Agyeman (2007) stressing that the Federal Republic of Nigeria has no policy for ICT in education and that Nigeria's education ministry is yet to design its ICT policy. The ministry of education created its ICT department in February, 2007. However, several different initiatives by government agencies and the private sector to introduce and promote ICTs in education are underway but the drawback to the programmes is the generally sporadic and insufficient supply of electricity power in the Urban areas. In addition, the Rural communities are worse off because of the absence of infrastructures. Nomsa (2013) also revealed in his study that the internet is only available in the urban schools and that there is no internet in most of the rural schools and where the rural schools are having electricity, there is still no internet and where there is internet access it is very poor. Greater percentage of the schools used in this study or rather located in Bayelsa west senatorial district falls into the rural region.

Also, Aguyo (2010) asserts that most rural schools in Kenya are yet to be connected to National electricity grid and those that are connected often experience frequent and long electricity outage. This unreliability he observed in his study is also present in several urban centres where electricity frequently fails and it remains an increasing challenge for the schools to acquire and set in place available, secure and reliable electricity supplies for implementing ICT and to put efforts in achieving sustainability. He went further that lack of infrastructures like roads constructions and transportations has barred the extension of power grid to remote rural schools and where these schools have access, actual power use is unreliable, especially if not accompanied by a generator.

The results in research question 6 and research question 7, Table 4.4a and table 4.4b on experienced and less experienced teachers' constraints in the use of ICT in teaching, indicated that the grand mean was 3.55 and 3.29 respectively. This revealed that experienced teachers face higher constraints of ICT use in teaching than the less experienced teachers.

Hypotheses three states that there is no significant difference in the use of ICT in teaching among experienced and less experienced teachers. The hypotheses was rejected and it is in line with Tsui (2003) who observed that number of years teaching does not guarantee expertise as a teacher in the sense that experienced teachers may be considered expert, while others remain "experienced-non experts. He went further that if teachers view ICT programs as either satisfying their own needs or their student needs, it is likely they would implement it in school and that teachers' attitudes, beliefs, adequacy, and skills influence successful implementation of ICT in schools.

Ojo (2005) also observed in his study that the corps of teachers who are expected to bring reform into Nigerian education system went through the traditional 'old' system without any exposure to ICT and it becomes a difficult problem for these set of teachers to acquire adequate mastery of skills and content that are embedded in ICT and that the latest development around the world has put many teachers in a state of disarray to whole heartedly embrace the e-teaching technology as many of the teachers lack the basic skills and access to computers. Before the advent and

popularization of ICT, teaching and training of teachers followed the traditional or conventional pattern. The teacher was trained to be a dispenser of information who was expected to meet passive receivers of information (learners). The teacher was believed to possess all that was required to develop the learner. On this, Dike (2008) cited that the teacher is looked up as a repository of knowledge, information or data bank that has answers to questions in his field of specialization. The flow of information in this traditional classroom is thus unidirectional from the teacher to the learner. Such communication is not interactive. It does not allow for “sharing of feelings and experiences” (feedback) which is what communication is all about.

However, the coming into existence of information and communication technology (ICT) gave rise to a paradigm shift in the process of teaching and learning. Among the challenges facing the teaching profession today is the ICT pedagogical and methodological issues. Information and Communication Technology (ICT) has brought into the educational system newer instructional delivery tools. Such tools are either learning assisting tools, medium of teaching or learning or organization and management tools. Teachers of the 21st century are expected to guide the process of acquiring knowledge by leading their students on how to use ICT facilities in schools. They are to exhibit ICT competencies adequately and effectively in instructional delivery. Teacher experience seems to be a major factor in the use of ICT in teaching. Teaching experience allows the teacher to determine when computers can be used for teaching and learning. Younger teachers were educated in an educational system where computers were the norm. It would not, therefore be surprising for them to be familiar or unusual with the use of computers for teaching and learning but are not using ICT other than occasionally and infrequently. This could be due to their lack of confidence regarding their subject knowledge compared to their ICT knowledge and skill. The more experienced older teachers are able to identify areas where computers can support and extend teaching and learning (Becta, 2004; 2007 & Scrimshaw, 2004)

Also, the result of the findings in this study contradicts with the study of Lalitha and Prased (2014) in their research which observed that there is no significant difference between the two groups (experienced and non experienced teachers) regarding the integration of ICT in learning. However, the teachers in their interview expressed two contrasting views about the impact of teachers' experience in integrating ICT into teaching. Four of them felt that teaching experience had an influence in using ICT in teaching. One teacher stated that ‘proper integration of any teaching aids is enhanced by experience’. On the other hand, six of them felt that teachers' experience did not matter. Instead, they distinguished two types of experience that affect ICT integration. The first is a general teaching experience with or without using ICT. The second is a specific teaching experience in which ICT was used during teaching. Regarding this distinction, the second one had an effect on integrating ICT, while the first one had nothing to do with the integration of ICT in teaching. The results of this study indicate that there is no significant difference between experienced (i.e., teaching for more than ten years) and less experienced teachers (i.e., teaching for less than ten years)

Also, Teo (2008) found that the years of computer usage is positively correlated with level of computer confidence. Meskil, Mossop, DiAngelo and Pasquale (2002) compared the use of technology between novice and expert teachers. They found that those novice teachers were far less comfortable in their implementations than the more experienced teachers who had no formal training with computers but a great deal of classroom experience. Lee (1997); Teo (2008); and Yaghi (2001) in their studies have found older teachers to be less confident with using computers. Lee (1997) as cited in Becta (2004) pointed out that many teachers of 'advanced age' did not have any computer education when in college, and as a result are in need of computer skills training to allow them to make use of computers in their work. Teo (2008) found that Singaporean pre-service teachers' attitudes for computer use were influenced by their age. Yaghi (2001) found that older teachers were less confident with using computers. In sum, the teacher's age had no effect on the implementation of ICT in learning. Though, it may have indirect effect regarding the teaching experience. In other words, young teachers may have less teaching experience than senior teachers, Lalitha and Prased (2014) indicated that age was a consideration in that many student teachers had themselves grown up with extended experiences of using ICT. It appeared that these experiences had given them a strong sense of identity as an ICT user and left them with an ‘habitus’ (Reynolds and Hammod, 2011)

The results in research question 8 and research question 9, Table 4.5a and table 4.5b on qualified and non qualified teachers' constraints in the use of ICT in teaching, indicated that the grand mean was 3.28 and 3.47 respectively. This revealed that non qualified teachers face higher constraints of ICT use in teaching than the qualified teachers. Hypotheses four states that there is no significant difference in the constraints of ICT use in teaching among qualified and non qualified teachers. The hypotheses was further rejected and it is line with Hennesy (2010) who

stressed that teachers ICT skills and access to professional development play a significant part in implementation of ICT in schools. Owolabi, et al.(2013) findings revealed that in Nigeria, it is relevant to say that computer studies have been introduced into the school curriculum especially at the tertiary level but it is yet to be matched with required practical exposure to the utilization of these new skills for optimal productivity. Much of the intervention has been in the areas of providing some measure of literacy in the aspect of word processing. Newhouse (2002) further state that teachers need not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programmes.

Also Dzionu (2010) observed that in many African countries, lack of well trained teachers and low levels of teachers' ICT skill and knowledge has been recognized as major obstacle in implementation of ICT in schools. Where such skills are missing, it would be difficult to fully implement the technology in schools. Several studies suggest that many educators have competence and confidence in using Information and Communication Technology instruments in the classroom, but they still make little use of technologies because they do not have enough time (Mumtaz, 2006). Agreeing with Sicilia (2005), the most common challenge described by all educators was the lack of time they had to plan technology integration in lessons presentation, in searching the internet websites, or look for simulations in YouTube related to the theme of their lessons.

Seweje (2006) also notes that Nigeria as a developing nation is getting stronger by the day but one important index of strength is the quality of education provided her citizenry. It is quite obvious that in spite of the copious exposure to computer education as a general studies course in Nigerian universities, more than 80% of Nigerian undergraduates and graduates are unable to adequately utilize the computer and more than 90% by conservative estimate of the Nigerian secondary school students are unable to use computer (Adako & Aturamu, 2006).The reason for this is not far-fetched. The teachers teaching these students and pupils are not skilled in computer education and application.

A study by Higgins, & Moseley, (2011) revealed that inability of teachers to understand why they should implement ICT in teaching and how exactly to implement it was an impediment to its implementation. Unfortunately, many teachers' training institutions in Africa continue to teach more about what is ICT rather than teaching how to use it during teaching and learning in classroom. In secondary schools, there is lack of qualified personnel to manage available systems, develop and use information communication technology facilities for the teaching-learning process. However, in schools where these personnel exist, they lack skills in designing and delivering courses/lectures in electronic formats (Ibadin, 2001).

Conclusion:-

The study assessed the computer teacher constraints in the use of ICT. It considered gender, location, experience and qualification of teachers. The gender has a significant difference with constraints of ICT use in teaching. Location has a significant difference with constraints of ICT use in teaching. The experience level has a significant difference with constraints of ICT use in teaching.

Moreover, qualification has a significant difference with constraints of ICT use in teaching. It was found that the male, rural, experienced and non qualified teachers face more constraints than the female, urban, less experienced and qualified teachers.

Recommendations:-

Based on the findings the following recommendations were made.

1. The National Policy on Education concerning ICT education should be reviewed in line with the New Curriculum for Senior Secondary Schools that made computer studies with the use of ICT compulsory and all policy statements regarding ICT should be implemented in all levels of our educational system.
2. In-service training programmes, workshops and seminars on ICT should be regularly organised for teachers. This will improve the level of compliance or implementation of ICT programmes and will give teachers a positive edge to the use of ICT in the teaching - learning process.
3. Consented efforts should be made by the Federal and State Government through the Ministry of Education to post teachers skilled in ICT to all school both in the rural and urban areas to impart ICT knowledge to the students.
4. Poor remuneration of teachers has adversely affected the teaching profession such that experts in ICT prefers to work in large cooperation were they can earn better salaries compared to teaching. In order to ameliorate this

situation, the conditions of teachers should be reviewed with a view to improving their remuneration in terms of salaries and other fringe benefit as well as prompt payment. This would attract more ICT teachers to the teaching profession.

5. School administrators should learn to motivate their computer studies teachers by reducing their workload in order to stir them to greater performance in the teaching and learning of computer studies/ICT at the Senior Secondary Schools in Nigeria. Computer Studies teachers should be allowed to teach their Computer Studies/ICT only and more time should be allotted to them to carry out practical teaching with their students.
6. The federal ministry of power should intensify effort towards stabilizing electricity in the urban and rural schools and consented efforts should be made to provide alternative measures were these communities are not connected to the national grid.
7. The Government at all levels (federal, state and local), NGO's, multinational companies, individuals and all stakeholders should contribute towards the successful provision of the necessary facilities for the proper and successful implementation of ICT.

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