



# Teachers' Competency in ICTs and Students' Academic Performance in English Language in Secondary Schools in Eket Local Government Area, Akwa Ibom State, Nigeria

**Akor Ernest**

Department of Educational Management  
Faculty of Education  
Ignatius Ajuru University of Education, Nigeria

---

## Abstract

The study examined the relationship between teachers' competence in ICTs use and academic performance of students in English Language in Eket Eket Local Government Area (LGA) of Akwa Ibom State. To achieve this objective, five research questions and five corresponding hypotheses guided the study. The survey research design was adopted for the study. The population for the study was 1,200 comprising 1,000 students and 200 teachers. A sample of 270 respondents comprising 120 teachers and 150 students were randomly selected for the study. A structured questionnaire was the instrument used for data collection alongside an English Language Achievement test. The instrument was validated by experts in Educational Technology and Tests, Measurement and evaluation. The reliability of the instrument was established through Pearson Product Moment Correlation analysis and an estimate of 0.86 was obtained. Data collected was analyzed using Population t-test and Pearson Product Moment Correlation analysis to test the null hypotheses at .05 level of significance. It was found out that competency level of teachers in the use of ICT was high while use of audio-cassette tapes, video-tapes, web-based training and audio-conferencing significantly relate with academic performance of students in English Language in Eket LGA of Akwa Ibom State. It was recommended among others that government should continue to ensure that the competency level of teachers in secondary schools in the use of ICTs is sustained over time through in-service training.

**Keyword:** Teachers, Competency, ICTs, Students, Academic Performance, English Language, Secondary Schools, Eket, Akwa Ibom State, Nigeria.

Reference to this paper should be made as follows:

Ernest, A. (2021). Teachers' Competency in ICTs and Students' Academic Performance in English Language in Secondary Schools in Eket Local Government Area, Akwa Ibom State, Nigeria. *International Journal of Scientific Research in Education*, 14(3), 446-472.

---

## INTRODUCTION

The premise that ICT is essential for bringing changes to classroom teaching and learning in educational systems around the world are under increasing pressure to the society and the world at large. The acronym for ICT means Information and Communication Technologies. Mandara (2012) sees ICT as those technologies that are used for accessing, promoting globalization and knowledge, data and skills from which education can benefit substantially. According to Law, Pelgurum and Plomp (2008), these data and skills include the ability to become lifelong learners within a context of collaborative inquiry and the ability and learn from experts and peers in a connected global community. As the access to information continues to grow exponentially, business education remains more channels for the transmission of prescribed set of information from teachers to students over a fixed period of time (Odiari, 1987). Buttressing the above view, Kwacha (2007) affirms that the use of educational systems are increasingly obliged to use ICT hence, it provides information and knowledge for learners as well as exercising abilities and skills needed in the labour market.

The labour market demands a work force that can use technology as a means to increase productivity and creativity. This includes networks such as fixed wireless and satellite, broadcasting networks, telecommunications, and applications like the internet, intranet, database management systems and multi-media tools. To Alibi (2004), these skills include identifying reliable sources of information, effectively accessing these sources of information, synthesizing and communicating that information to students. Information is very vital for students teaching, learning as well as in carrying out class assignments and homework. Hawkins (1998) sees information as essential for effective means for processing and transmitting teaching-learning.

The evolution of ICT in the secondary school environment brought a lot of changes in the teaching-learning situations. These new changes encourages distance learning and also achieve a closer collaboration between different schools and also pave way for a new pedagogical approach where there is unparalleled ability to spread knowledge and disseminate information (Nwosu & Ogobomo, 2012). The authors further attest that the pace of change brought about by new technologies has had a significant effect on the way people live, work and play worldwide. New and emerging technologies challenges traditional process of information use, dissemination and the ways information are managed. Easy worldwide communication provides instant access to a vast array of data, challenge assimilation and assessment skills, rapid communication plus increased access to ICT at home, work and in education establishment. ICTs have the potential for increasing access to and improving the relevance and quality of education by facilitating the acquisition and absorption of knowledge, to enhance educational systems, improve policy formulation and execution and widen opportunities for students. With ICT, according to Sardka and Sader (2013), students can have access to lessons presented with soft wares, simulate situations, build their own knowledge, improve their knowledge base, work with peers and experts across the globe, explore authentic issues, select the mode by preference and work at their own pace.

However, when ICT are appropriately utilized, this will assist business education students in accessing information, strengthen the need for increasing digital learning, and raise business education quality and standard, by assisting the students in teaching and learning process connected to real life situation. Though ICT has been the order of the day in educational environment, yet, there still hunches in utilizing ICT in Secondary schools in Eket Local Government Area of Akwa Ibom State. Undoubtedly, the use of ICTs in teaching leaves the

students in greater achievement academically. In view of Mandara (2012), the utilization of ICT in facilitating the knowledge acquisition and dissemination within and between variables had been such that human input is reduced to the barest minimum with supersonic speed. Realizing the importance of ICTS, the government of Akwa Ibom State has as a policy mandated secondary schools in Eket to embrace the use of ICTs in teaching in order to make her students to compete with students from other States. The extent of adoption and attendant influence in the academic performance of students has not ascertained. Such an assessment which is capable of providing information for policy improvement informed the researcher's decision interest in the present study.

Information and Communication Technology (ICT) is the reason for academic standardization in this modern education. The study claims that teachers' competences in ICT have a great role in student academic performance in modern educational process. Fundamental skills come first - like managing electronic files, using computerized databases and spreadsheets, sending and receiving e-mail messages, and creating documents with graphics. These skills are prerequisites for more advanced skills, such as accessing online resources, creating desktop publishing documents, developing multimedia presentations, selecting and customizing instructional software to fit students' needs, streamlining record-keeping and other administrative procedures with electronic tools, and observing the correct protocols in sharing intellectual property. Competencies such as use of audio-cassettes tapes, video-tapes, web-based training and audio-conferencing in teaching by teachers have potentials for improved academic performance by students.

Competence in ICT as to knowledge, skills, and attitude and their pedagogy as to competency in teaching services with ICT and level of implementation of ICT in academic subjects can improve school's academic performance (Taylor & Hogenbirk, 2001). The ICT Competencies are a set of technology standards that define proficiency in using computer technology in the classroom. The competencies consist of computer-related skills grouped into four general domains, that is, basic technology operation, personal and professional use of technology tools, social, ethical, and human issues and application of technology in instruction. ICT competencies are based on using tools and technical equipment for the reaching, disturbing and transferring the knowledge. They include any technology that helps to produce, manipulate, store, communicate, and/or disseminate information. It means that the ICT competency is very important to improve the communication in the learning and teaching process. Educators must be versatile enough to adapt and to encourage the use of ICT to be more efficient in modern educational trends. Information and Communication technology (ICT) is meant to support the learning process not only for the student but also of the teachers themselves as part of their professional development.

ICT focuses primarily on Communication Technology. Communicate using digital tools. These include email, instant messaging, mobile colleagues, and knowing how to organize and manage these tools in the classroom. Communication in this information age means to establish commonness: for the greater the communality, the greater the potential for communication. Hendricks (1989) posited that the law of communication is Bridge building. Thus, communication compels that the truly impart information must be the building of bridges for information linking. For a modern teacher to understand what communication means in the classroom and in the entire school system, he has to understand the difficulties in ICT and then learn to improve in communication. In other words, he should not be a cynic. Information and Communication Technology (ICT) is the most important tool for an effective and efficient

teacher. For without effective communication, a teacher cannot perform his functions. ICT brings teachers and teachers together, teacher and parents together, teacher and learners together and it is also the force that may drives them apart if it is thwarted. It establishes relationship and stimulates interactions. What makes a teacher stand out among others is the ability to communicate through spoken language (native or foreign).

A modern teacher is a bridge builder that requires initiative and readiness. To be able to build bridges, a modern teacher first must break all barriers such as social, religious, sexual and moral, this establishes a base for communication both in the school environment, community and in the actual teaching- learning experiences (classroom).

Today, technology has reached a stage where machine can speak to man verbally in any language in a teaching- learning situation. Smart boards in the classroom can present a verbal interaction. Modern teachers should be aware that there has been a tremendous progress in communication between machines and human beings. Computers and electronics have made it possible hence, the need to ensure ICT use in secondary schools.

### **Statement of the Problem**

Information and communication technology rules the world and its application to teaching and learning in secondary schools in Nigeria generally and Eket LGA. in Akwa Ibom State in particular cannot be over stressed. In spite of Government efforts at ensuring that ensuring that her teachers are ICT compliant in order to effectively teach students in this direction is plausible, but the extent of success is not known.

Evidence from the literature shows a positive effect of specific uses of ICT on pupils' attainment in almost all the National Curriculum subjects, the most substantial positive effects being in mathematics, science and English at all key stages. There is a strong relationship between the ways in which ICT has been used and the resulting attainment outcomes. This suggests that the crucial component in the use of ICT within education is the teacher and their pedagogical approaches.

All these point to the fact that ICT resources are important in teaching and have implications for student's performance. The poser therefore is what is the competency level of teachers in the use of ICT? Is teachers' competency in ICTs related to academic performance of students? Attempt to provide answers to these questions necessitated this study.

### **Purpose of the Study**

The purpose of this study is to examine the relationship between teachers' competency in Information and Communication Technology (ICT) and students' academic performance. Specifically, the study sought to:

- Ascertain the competency levels of teachers in the use of ICTs in Eket LGA.;
- Determine the relationship between teachers use of audio-cassette in teaching and academic performance of students in English Language in Eket LGA.;
- Examine the relationship between teachers use of video-tapes in teaching and academic performance of students in English Language in Eket LGA.;
- Ascertain relationship between teachers use of web-based training and academic performance of students in English Language in Eket LGA.;

- Examine the relationship between teachers use of audio-conferencing in teaching and academic performance of students in English Language in Eket LGA.

## **Hypotheses**

The following research hypotheses were postulated to guide the study:

- The competency level of teachers in the use of ICTs in Eket LGA. is not significantly high.
- There is no significant relationship between teachers use of audio-cassette in teaching and academic performance of students in English Language in Eket LGA.
- Teachers' use of video-tapes in teaching does not significantly relate with academic performance of students in English Language in Eket LGA
- There is no significant relationship between teachers use of web-based training and academic performance of students in English Language in Eket LGA
- Teachers' use of audio-conferencing in teaching does not significantly relate with academic performance of students in English Language in Eket LGA.

## **Significance of the study**

This research has greater significance as it provides insight through findings; on the teachers' information and communication technology (ICT) competence and students' academic performance. This study would provide in-depth analysis of the topic in order to provide key information to further research work in similar area. In the same vein, the study provides knowledge and guideline such that it may be helpful to policymakers. The research is therefore of great importance for educational planners and other social scientists. Finally, it will provide an input to the students-teachers and researchers in the areas of e-learning.

This research work is embarked upon with the view to extending the frontier of knowledge in the field of education. The present study is hereby carried out with this same objective, especially in the field of e-learning. It has therefore contributed to the extension of the frontier of knowledge in that; the study has shown the predictive power of the selected factors, especially socio-demographic factors, prior computer skills and time management status in the determination of students' academic performance and teachers' competence.

## **CONCEPTUAL FRAMEWORK**

The nexus between ICT and academic performance of students is self-reinforcing like a spiral. The independent variables used in this study are competency level of teachers, use of audio-cassette tapes, video-tapes, web-based learning and audio-conferencing in teaching. The dependent variable on the other hand is academic performance in English language. A relationship exists between the sub levels of independent variables and the dependent variable. This implies that competency level of teachers, use of audio- cassette tapes, video-tapes, web-based learning and audio-conferencing in teaching relate to considerable extents with academic performance of students. It follows therefore that academic performance of students in English Language could be influence by competency level of teachers, use of audio- cassette tapes, video-tapes, web-based learning and audio-conferencing in teaching and vice versa.

The interaction between the independent variable and dependent variable is enhanced by the competence of teachers in a normal classroom situation. The competency of the teachers and the classroom environment constitute the intervening and moderator variables respectively that help to give a better understanding of the relationships.

## **Empirical Studies**

### **Information and Communication Technology Competencies of Teachers in Teaching**

The evolution and development of ICTs has resulted in a paradigm shift in the educational system. ICTs are changing the way people learn, offering new alternatives to the traditional classroom. In this new economy, it is essential for learners to have access to education anytime and anywhere. Haddad and Draxler (2002) state, that lifelong learning and training for the workplace cannot be confined to the traditional classroom. It is unrealistic and unaffordable to continue to ask learners to come to a designated place every time they have to engage in learning. ICTs allow the delivery of education to adapt to an individual's needs as opposed to having the individual adapt to how the education is delivered. Education will not be confined to the four walls of a classroom but to wherever and whenever the learner deems appropriate. Education will not be a location anymore, but an activity: a teaching/learning activity (Haddad and Draxler, 2002). ICTs have the capability of providing personalized, just-in-time, up-to-date, and user-centred education activities (Haddad & Draxler). Besides their potential to provide education to anyone, anytime and anywhere, ICTs have encouraged new research and development in teaching and learning techniques. As stated by Dean (2002), Schank, the founder of Cognitive Arts, believes that educational institutions must adopt a new way of teaching. He claims that students "learn better through experiential and emotional learning rather than through memorizing names and dates" and thus educators must simulate real-world environments (Dean, 2000).

Technology can be used to facilitate these types of environments. An example of this is using flight simulators to train novice pilots (Dean, 2002). On the other hand, Aldrich argues that this type of learning is restrictive and instead believes in "the ant on the basketball model" where learners have the freedom "go wherever they want but stay in a finite world". Courses would be customized to each user and provide a wide array of options, "like a computer game (Dean, 2002). Although these two methods offer two conflicting views of learning, the fact that this discussion is taking place and experiments are being done to determine new methods of learning has intrinsic benefit of its own; experimentation will eventually lead to new and innovative methods being developed.

There are a variety of different technologies that can be used in teaching. Each of these technologies has its own redeeming qualities and limitations, and different situations call for different technologies. According to UNESCO ICT Competency Framework for Teachers (2018), teachers need to harness ICT to guide learners in developing knowledge, society skills such as critical and innovative thinking, complex problems solving, the ability to collaborate, and socio-emotional skills. Teacher training and continued on-going, relevant professional development for teachers are essential if benefits from investment in ICT are to be realized. The ICT for the conception of teacher development as a lifelong learning process, to this end, teachers' learning and application of digital skills are recognized as an integral part of the capacity development of teachers from pre-service to their continuous professional growth.

throughout their careers. At the pre-service training stage, the preparation of future teachers in subject specific or inter-disciplinary knowledge and pedagogical approaches aims at building their understanding of the relevance of ICT for teaching and learning, often summarized as 'Technological Pedagogical Content Knowledge (TPCK)'. As in some system, practicing teachers may not have benefitted from exposure to technology in their pre-service training, it would be important that the introduction of ICT skills training not be limited only to the aspect of 'application of digital skills' but also cover other aspects of the ICT.

Theoretical components of the training and practical experiences offered to future teachers should be constructed to enable the him/her to acquire, deepen and creatively use ICT in his/her professional practice. Institutional strategies to streamline the pre-service and in-service teacher education programmes to ensure training and support for the in-service teachers building on the knowledge acquired in pre-service institutions would be beneficial. Furthermore, teachers' continuous professional development should be supported to enhance teachers' hand-on skill of applying ICT -based pedagogy for classroom management, curriculum implementation, student assessment and collaborative work with peers.

Learning environments need to reflect the potential uses of knowledge that students are expected to master, in order to prevent the acquired knowledge from becoming inert (Bransford, and Williams, 1990). In addition, teachers should stimulate students to be engage in, active ICT knowledge construction. This calls for open-ended learning environments instead of learning environments which focus on a mere transmission of facts (Collins, 1994; Hannafin, Hall, Land, and Hill, 1994; Jonassen, Peck,' and Wilson, 1999). ICT can contribute to creating powerful learning environments in numerous ways. ICT provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. ICT may also make complex processes easier to understand through simulations which again can contribute to authentic learning environments. Thus ICT may function as a facilitator of active learning and higher-order thinking (Alexander, 1999; Jonassen, 1999). The use of ICT may foster co-operative learning and reflection about the content (Susman, 1998). Furthermore, ICT may serve as a tool to curriculum differentiation, providing opportunities for adapting the learning content to the needs and capabilities of each individual student and by providing tailored feedback (Mooij, 1999; Smeets and Mooij, 2001). As Stoddart and Niederhauser (1993) pointed out, ICT may fit into a spectrum of instructional approaches varying from traditional to innovative approaches.

### **Use of audio-cassette tapes in teaching and students' academic performance**

Audiotapes can be played by any standard cassette player. Through audio, the tapes can convey information that may be easier to illustrate with sound than simply through text or diagrams. It can accompany other means of instruction (print-based material, classroom teacher among others.) and provide detailed information step-by-step (Perraton et al., 2002).

Tapes are recordable and thus can be reproduced easily and cheaply. Tapes provide a permanent and flexible storage of information. The tapes can be stopped to allow for classroom interaction and discussion and they can be replayed in instances where it might be beneficial to repeat parts of lessons. Radio programmes can be recorded to allow the lessons to be replayed at a later date (Perraton et al., 2002). Since tapes are relatively small they are portable and can be transported to different areas through the postal service or other delivery service.

A development team is required to develop the lesson plans, edit and record the tapes, and integrate the tapes appropriately with accompanying print-based material or other media. Audiotapes provide only one-way communication where an external teacher cannot interact directly with students and they cannot gauge the progress of the students. The lessons on the tape must also be interactive. To increase effectiveness, the lessons must contain pauses that allow students to think and discuss. Tapes lose their effectiveness if the information is presented as one long teaching (Perraton et al., 2002). It is difficult to present complex concepts using tapes (Nunes and Gaible, 2002). Another limitation with tapes is that the sound quality depends on the quality of cassette player and the age of the tape. The sound quality on tapes degrades after repeated use and recording (Perraton et al., 2002).

Radio is one of the oldest technologies used for distance education (Stevens, 2001). Radio programmes can be broadcast or interactive (Oujo, 1999). Broadcast radio mirrors the traditional classroom-based model where a teacher teaches through the radio programme and students typically follow with print materials (Oujo, 1999). It can be thought of as “strict” one-way communication where students are not expected to respond and therefore it is hard to gauge the progress of the students (Oujo, 1999). Interactive radio instruction (IRI) can be described as an interactive lesson where an external teaching element is involved in classroom activities via radio (Dock et al., 1999). IRI allows the students to participate as the lesson progresses. To be interactive, a lesson can have spaces or pauses where students can think, develop responses, discuss with other students, or have time to let information sink in.

Radio instruction involves the production, transmission, and reception of the radio programmes (Dock et al., 1999). There are different types of radios available to learners: electric radios (e.g. transistor radios), battery-powered radios, and solar-powered crank radios (Oujo, 1999). Thus, students and the educational organizations can choose a radio that best suits their situation based on the availability of electricity and the supply of batteries. In some cases it may be more cost-effective in the long term to use a solar-powered crank radio. A local or national broadcaster is required to transmit the programme at a particular frequency and specific time (Perraton et al., 2002). The production and development of a programme involves planning, scriptwriting, radio production, and piloting of the programmes by a development team (Dock et al., 1999).

Radio is advantageous since it is relatively inexpensive for learners in developing countries and it is accessible for the illiterate and the poor (Oujo, 1999). Due to the availability of inexpensive radio receivers, it has the potential to reach a large number of learners (Stevens, 2001). Although radio instruction is considered to be interactive, it is still a one-way communication medium from the external teacher to the learner. The interaction is with printed materials, other students, and the classroom teacher. The material presented in the lesson is only available at the time of the broadcast unless it is recorded. Some other limitations of radio instruction include the inconvenience due to the rigidity of programme schedules and the dependence on “regular and reliable transmission facilities and broadcasting infrastructure” (Perraton et al., 2002). As with cassette tapes, radio is audio-based and thus not always the most effective means for presenting complex concepts

ICTs such as videos, television and multimedia computer software that combine text, sound and colourful moving images can be used to provide challenging and authentic content that will engage the student in the learning process Stoddart and Niederhauser (1993). Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and becomes more involved in the



lessons being delivered. Some of the parents of the respondents opined that their children were feeling more motivated than before in such type of teaching in the classroom rather than the stereotype 45 minutes teaching. They were of the view that this type of learning process is much more effective than the monotonous monologue classroom situation where the teacher just teaches from a raised platform and the students just listen to teacher. ICT changes the characteristics of problems and learning tasks, and hence play an important task as mediator of cognitive development, enhancing the acquisition of generic cognitive tools (Reeves and Jonassen, 1996). The influence of the technology on supporting how students learn will continue to increase. Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centred settings and by enabling learning to be related to context and to practice (Berge, 1998; Barron, 1998),

Attwell and Battle (1999) examined the relationship between having a home computer and academic performance. Their findings suggest that students who have access to a computer at home for educational purposes have improved scores in reading and math. Becker (2000) found that ICT increases student engagement, which leads to an increased amount of time students spend working outside class. Coates et al. (2004) showed that students in on-campus courses usually scores better than their online counterparts, but this difference is both significant here. ICTs especially computers and internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. ICT helps in providing a catalyst for rethinking teaching practice (Flecknoe, 2002; McCormick and Scrimshaw 2001) developing the kind of graduates and citizens required in an information society (Department of Education, 2001); Improving educational outcomes (especially pass rates) and enhancing and improving the quality of teaching and learning (Wagner, 2001; Garrison and Anderson, 2003). ICT can help deepen students' content knowledge, engage them in constructing their own knowledge, and support the development of complex thinking skills (Kozma, 2005; Kulik, 2003; Webb and Cox, 2004). Studies have identified a variety of constructivist learning strategies (e.g., student work in collaborative groups or students create products that represent what they are learning) that can change the way students interact with the content (Windschitl, 2002).

### **Use of Video-Tapes in Teaching and Academic Performance of Students**

Videotapes can be produced and edited by using a portable video camera and a home video editing suite. The technology for video production continues to improve with the emergence of digital video cameras and new computer software that can facilitate the editing process. Videotapes can be viewed by using a TV and VCR combination. It is recommended that videotapes be no longer than 10 minutes with short segments of less than three minutes (Hampton, 2002).

Videotapes appeal to both audio and visual senses. Real-life situations can best be presented and described using video as opposed to using text or audio (Nunes & Gailbe, 2002). Videos can be used when “introducing a new theme to motivate and contextualize learning, after a topic has been addressed in a few class periods to aid students in applying the knowledge they acquired, or after an entire module is completed to show connections to other subjects and disciplines” (Nunes & Gailbe, 2002, p. 98). The learner has the flexibility to replay, pause, and rewind videotapes and can repeat lessons as often as they wish (Hampton, 2002). Videotape can

support the teaching of practical skills delivered through open and distance learning. Other benefits include “ease of use for the learner, low duplication costs, relatively wide access to the playback technology, and educational effectiveness for imparting practical information” (Stevens, 2001). Another advantage is that captions and visual cues can be used in the videotapes to help the hearing-impaired. Caution must be exercised when developing videotapes so as not to include too much information as that could degrade the learning experience. Practical skill must be taught in a clear, concise manner. This strays from the typical teaching model where teachers are taught to provide plenty of explanations and examples. These extra explanations and examples are better served in a face-to-face environment rather than on videotape.

CD-ROMs (Compact Disc-Read Only Memory) store information digitally and they can be used on any computer equipped with a CD-ROM drive (Hampton and Bartram, 2002). DVDs (Digital Video Disk or Digital Versatile Disk) are similar to CD-ROMs and can be used the same way as CD-ROMs but contain more information. Most CD-ROMs have 650 or 700 megabytes storage space whereas most DVDs have room for 4.7 gigabytes, which equals approximately seven times more storage space than a CD-ROM. DVDs are not widely used yet, mainly because of different standards for writing to DVDs. Once the problem of conflicting standards is resolved, DVDs will probably supplant CD-ROMs as the preferred portable storage medium.

CD-ROMs have a large capacity and can support the storage of information in a variety of formats including text, animation, video, audio, and graphics. Thus, learning materials can be presented in different ways. This allows the material to cater to multiple styles of learning (Hampton, 2002). Learners might first view a video, which provides an overview both visually and audibly of the practical skill they are acquiring. The video could be followed by clear digital photographs of the step-by-step procedure with either text prompts or a voice-over to provide additional explanation. An overview of the complete process could occur in an animation, and then the whole process summarized in dot points using text (Hampton, 2002).

Since the material is stored digitally on CD-ROM or DVD, it is very durable and the quality does not degrade after repeated use. However, scratching the surface or other abuse of the medium may prohibit it from being read by the CD-ROM drive. A major limitation with CD-ROM and DVD is that a computer with CD-ROM drive (in the case of DVDs, a DVD-drive) is required to access the information. This equipment may not be available to learners in developing countries. Depending on the complexity of the instructional content, a team of experts may be required to develop high quality product. The development team could include a computer programmer, graphic artist, content specialist, and instructional designer.

Albert Bandura, Girasoli and Hannafin (2008) encouraged the use of asynchronous CMC tools to promote student self- efficacy and hence academic performance. Fister et al (2008) also depict the power of tablet PCs to improve mathematics instruction. ICTs have the potential for increasing access to and improving the relevance and quality of education. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. Student using ICTs for learning purpose becomes immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Reeves and Jonassen, 1996), the influence of the technology on supporting how student learn will continue to increase

### **Web-based Training and Teaching/Students’ Academic Performance**

Internet/Web-Based training provides an environment where students’ access and study course materials online. It may involve the use of live e-learning tools such as application sharing,

Internet telephony, online whiteboards, break-away rooms, discussion boards, and chat and messaging programmes that allow real-time interaction between teachers and learners. It can also be used to transmit text, graphics, images, animation, or video. The required tools for online learning include a personal computer and an Internet connection. There are several ways a user can connect to the Internet: standard analog modem (for example, 56 Kbps), Digital Subscriber Line (DSL), cable modem, Integrated Services Digital Network (ISDN), Local Area Network (LAN), cellular, and wireless broadband (fixed wireless and satellite). All connections except for a standard analog modem connection are considered broadband connections. All of these methods allow connection to an Internet Service Provider (ISP) that provides a gateway to the rest of the Internet. An analog modem and ISDN required a “dial up” connection where a user must dial in to connect to the ISP, whereas the other Internet access methods, denoted as always on connections, required no dialling. There are many Wireline device thus:

**Analog Modem:** This is the original device that allowed computers to connect to the Internet. Analog modems can be internal to the computer or an external device that connects through a serial port on the computer. The standard modems have the capability of transmitting at 56 Kbps. Since this relies on older transmission technology, analog modems provide the slowest connection speed of all other Internet access methods. However, it is relatively inexpensive and it is still widely available to most people.

**ISDN:** Similar to DSL, ISDN uses a normal copper telephone line to connect to the Internet. The copper line must be “converted” to a digital ISDN line, after which one can connect to the Internet and have a phone conversation over the same line. Basic service enables connection speeds up to 128 kbps. An ISDN modem is used to interface a computer to the telephone network. The modem is either an internal card or an external device that connects to a computer’s serial or USB (Universal Serial Bus) port (ISDN, 2000) (broadband 101 - ISDN..., 2001). ISDN is also a “dial up” service and users must dial in to their ISP (Broadband 101- ISDN..., 2001).

**DSL:** DSL uses a normal copper telephone line (a pair of copper wires) to provide a high-speed connection to the Internet. Thus, it is telephone companies that typically provide DSL connections. When connected to the Internet, the phone line can still be used for normal voice calls. A DSL transceiver (modem) is the interface between the computer and the phone line. The computer is connected to the modem either through a USB or 10 base-T Ethernet. If using an Ethernet connection, the computer must have an NIC installed where the NIC connects to the modem through an Ethernet cable. If the computer has a USB port, it can connect to the modem via a USB cable. There are two different categories of DSL: asymmetric and symmetric. For asymmetric DSL, the downstream speed is faster than the upstream speed whereas for symmetric DSL, the downstream and upstream speeds are the same. Connection speeds vary from country to country and they also depend on the particular DSL provider within that country. In OECD countries, downstream (Internet to customer) connection speeds range from 128 kbps to 8 Mbps (where speeds of 256 kbps and 512 kbps are the most common) and upstream (customer to Internet) connection speeds range from 64 to 740 kbps (where a speed of 128 kbps is the most common) (Paltridge, 2001).

**Cable:** A cable connection uses the same coaxial cable used for television signals to send and receive data to and from the Internet. A cable modem acts as the interface between the computer and the coaxial cable. The computer is connected to the modem either through USB or 10 base-T Ethernet. If using an Ethernet connection, the computer must have a NIC installed where the NIC connects to the modem through an Ethernet cable. If the computer has a USB port, it can connect to the modem via a USB cable (broadband 101 – cable, 2001). As with DSL, connection speeds depend on the cable provider within the particular country. In OECD countries, the advertised downstream connection speeds range from 128 kbps to 2 Mbps (where speeds of 256 kbps and 512 kbps are the most common) and the advertised upstream connection speeds range from 64 to 768 kbps (where a speed of 128 kbps is the most common) (Paltridge, 2001).

**LAN:** The computers in businesses and educational institutions are usually connected to a LAN. A LAN connects computers and peripheral devices using the same transmission line, allowing for applications, devices (for example, printers), and data storage to be shared among the members of the LAN. There are three different methods for connecting computers in a LAN: cables, wireless, and power line systems (Rusten and Hudson, 2002). Cabled LANs use cables and hubs to physically connect the computers and devices. A hub controls the flow of network traffic between individual computers and the system's server, usually in clusters of 20 to 30 cables. Wireless LANs do not use cables but rather a wireless network adapter (receivers) that is either an internal network card or an external device that connects to the computer through USB. As well, one or more wireless network hubs/transmitters are connected to the server (Rusten and Hudson, 2002). Power line LANs use the existing power lines in an institution for the transmission of network traffic (Rusten & Hudson, 2002).

LANs are typically connected to an ISP through a high-speed T1 line provided by a local telephone company. A T1 line is either a fibre optic cable or a copper line and can carry a data rate up to 1.544 Mbps. All the users that connect through the same T1 line share this bandwidth. Larger companies need higher capacity lines such as T3, OC3, OC12, OC48, and OC192. The higher capacity lines run on fibre optic cables.

**Optical fibre:** Optical fibres provide a huge amount of bandwidth that is ideal for high-performance applications such as videoconferencing or web-based applications that rely on a large amount of graphics (Rusten & Hudson, 2002). As mentioned previously, telephone companies provide these high capacity lines. They are typically installed for institutional customers such as hospitals, schools, and businesses (Rusten & Hudson, 2002). Similarly, several Wireless technologies are in use today and include:

**Cellular:** A cell phone with a cellular modem can be used to connect to the Internet. In some developing countries (such as Cote d'Ivoire, Gabon, Rwanda, Tanzania, Uganda, Cambodia, and the Philippines), cellular telephones are more widely used than wireline phones. However, cellular access can be expensive and the bandwidth is limited. Thus, it is more suitable for short bursts of use such as e-mail than running web-based applications (Rusten and Hudson, 2002).

**Wireless Broadband:** There are two types of wireless broadband service: fixed wireless and satellite (*Wireless*, 2003).

**Fixed Wireless** – A fixed wireless broadband connection uses a ground-based antenna system. A small rooftop antenna communicates with transmission towers, which are directly connected to

the Internet (Keizer, 2001). A modem or receiver connects to the exterior antenna via coaxial cable and also connects to a NIC installed on the computer through an Ethernet cable (Wireless, 2003). (Broadband 101 – Wireless..., 2001). Downstream connection speeds can reach 5 Mbps but are usually around 1 – 2 Mbps. Upstream speeds are around 256 kbps (Keizer, 2001).

*Satellite* – For high-speed satellite Internet connections, a satellite dish and a “satellite modem” are required. Data signals are sent from the satellite dish to satellites orbiting the Earth. The dish is about 2-foot by 3-foot in size and the modem acts as the interface between the satellite dish and the computer. A coaxial cable connects the dish to the modem. The latest satellite technology allows for downstream and upstream speeds up to 400 kbps. For older satellite service, one may also require an analog modem and another ISP for upstream data transfer. Using an analog modem degrades upstream rates to the speed capability of the modem. As mentioned previously, analog modems have a maximum data transfer rate of 56 kbps.

The major advantage of web-based training is that students can study anytime at their own pace and anywhere as long as there is a computer connected to the Internet (Hampton and Bartram, 2002). If designed properly and with the students’ needs kept in mind, online learning can be a very powerful, interactive, and virtual learning environment that can stimulate and enhance the learning experience.

Effective online learning, however, requires appropriate infrastructure support and properly designed applications. In developing countries, the infrastructure may not be readily available. People may not be able to afford or have access to the Internet or quality computers (Lizardi, 2002). According to the most recent statistics from Nua Internet Surveys, as of May 2002 only 9.57% of the world’s population are using the Internet and roughly only 37% of those users live outside Canada, the US, and Europe. Without adequate infrastructure, the quality of graphics, audio, and video may be subpar. If the application is not designed properly and the quality is degraded, the applications may hinder learning instead of enhancing it. The learning materials may be reduced to simply a text on a screen. Hampton and Bartram (2002) pointed out that it has been shown that people read 25% slower from the screen, and Delio (2000) indicated that retention is 30% less than from printed materials. Another obstacle for online learning is that the development of quality applications requires a team of moderately to highly skilled individuals in computer applications and instructional design (Stevens, 2001). The team may need to include a computer programmer, graphic artist, content specialist, and instructional designer.

Many course development tools are now available, which allows teachers with no computer programming skills to develop high-quality web-based training programmes. The three most commonly used platforms are: Blackboard (<http://www.blackboard.com>), Desire2Learn (<http://www.desire2learn.com>), and WebCT (<http://www.webct.com>). All three solutions are server-based and allow access through a web browser to provide e-learning solutions through the Web. All three platforms have the capacity to provide course materials; manage enrolment and registration; develop evaluation material such as quizzes, tests, or assignments; communicate with teacher(s) and students online through an announcement section, discussion boards, e-mail, real-time chat sessions or “class rooms”, and an interactive whiteboard; take and save notes about a course; manage grades and provide the grades to the students; present important dates through a calendar tool; provide links to related web sites.

The Blackboard Learning System provides course management capability. Some of the other key features include a faculty and student profile, and the ability to create groups of

students for collaborative work and enable protected discussion boards, virtual class rooms, and file exchanges for each group (Yaskin & Gilfus, 2002). Blackboard allows students to navigate through the different parts of the course such as staff information, course documents (learning materials and aids), reading lists, assignments, communication tools, discussion board, and external links.

The Desire2learn Learning Platform allows teachers to create and manage courses and course offerings. It also allows for setting up and editing an organizational structure (that is, organization's name, departments, courses, course offering, modules, topics, etc.). The learning environment contains key areas such as "My Home" (a central location for an individual's courses), "My Calendar", "My Notes" (a student's note-taking area that can be linked to specific content pages), and My Locker/Briefcase (a personal storage area of files and documents). A "document sharing" feature allows documents to be shared with classes or specific groups. Other features include progress tracking, survey tools, feedback systems, journals, portfolios, web pages, shared file storage, and a glossary. Desire2Learn also offers a learning object repository to store and manage learning objects.

WebCT can be used to create entire courses online or to complement face-to-face instructions. Some of the other key features of WebCT include the ability to create a course syllabus, provide self-tests for students, and develop a searchable glossary. WebCT allows students to navigate through the different parts of the course such as staff information, course documents (learning materials and aids), calendar, syllabus, reading lists, assignments, communication tools, discussion board, grades, and external links. WebCT also provides e-Packs, which are a "set of customizable online course materials developed and formatted for use in WebCT" (WebCT 2002).

Web-based Platforms decrease developmental time; reduce skill requirement for developing learning materials; reduce development cost; provide consistency in format; facilitates maintenance and support; updating is done by suppliers.

The problems with web-based platform are that institution has no control over licensing cost; difficulties when supplier goes out of business; platform may provide more unnecessary features; platform may not be available in the preferred language and form may require high-end systems.

ICTs allow learners to explore and discover rather than merely listen and remember. The World Wide Web (WWW) also provides a virtual international gallery for students' work (Loveless, 2003). ICT can engage and inspire students, and this has been cited as a factor influence ready adaptors of ICT (Long, 2001; Wood, 2004).

ICT helps students in learning by improving communication between the learners and the instructors (Valasidou & Bouzios, 2005). The analysis of the effects of the methodological and technological performance seems to be evolving towards a consensus, according to which an appropriate use of digital technologies in education can have significant positive effects both on students' attitudes and their achievement. Research has shown that the appropriate use of ICTs can catalyse the paradigmatic shift both content and pedagogy that is at the heart of education reform in the 21<sup>st</sup>, century.

### **Use of Audio-Conferencing in Teaching and Academic Performance**

Audio-conferencing allows two-way, real-time communication between teachers and learners through audio (Stevens, 2001). Older audio-conferencing technology uses the telephone system

infrastructure, where the key component is an electronic device called an audio-conferencing bridge. The bridge acts as the main hub for the conference where the students simply dial into the bridge to connect to the conference. Calls can also be made from the bridge itself. All the calls are combined so all the connected callers can converse simultaneously (Rao, 1994). The maximum number of students depends on the number of telephone lines terminated at the bridge. All that is needed at each participating site is a standard telephone (Rao, 1994). Radio transceivers combined with the necessary antennas, masts, and cable can also be used as the transmission medium.

Audio-conferencing can also be carried out using Internet telephony where digitized voice packets are sent between individuals over the Internet. Individuals can use computer programmes such as AOL Instant Messenger, Microsoft NetMeeting, or MSN Messenger to converse with individuals. As well, some telephone and cable companies are beginning to provide Internet telephones.

Older audio-conferencing technology simply includes local or long-distance telephone costs (depending on the location of the students), and the cost for the bridge itself or the bridging services. Internet audio-conferencing incurs the cost of Internet access and the Internet telephony equipment and/or programmes.

The main advantage of audio conferencing is that it allows for direct, two-way interaction between students. Discussions occur in real-time where learners can ask questions and teachers can respond immediately. Another advantage is its low set-up and operating cost.

The main disadvantage of audio-conferencing technology is the absence of visual interaction between the teachers and students. No visual cues or visual materials can be used, so any accompanying learning materials must be pre-distributed (Stevens, 2001).

Audiographics is essentially audio conferencing accompanied by visual and graphical aids. Graphics can be transmitted by facsimile (fax) machine, still video system, computers (text or graphic display), or electronic drawing systems (such as electronic whiteboard) which allow a student to draw or write on an electronic screen which is transmitted to a remote site where other students may see it (Audio-graphics, n.d.).

Along with the equipment required for audio conferencing, other components can include a PC with audio-graphics software, an interactive white board, overhead projector, or still video projector (Stevens, 2001). For example, a lesson or tutorial can be taught by a teacher through an audio conference and the students may have pre-distributed materials such as Microsoft PowerPoint™ slides that accompany the lesson. The material may also be available on the Web in the form of images, text, video, or applets on a web page. Another option is to have the teachers and students interact graphically through interactive white boards during the lesson: “The computer is used as a blackboard. The graphics appear immediately on students’ screens, and the students may either respond by using their own drawing pads or by speaker phone (Audio-graphics, n.d). Fax machines can be used to rapidly transmit learning materials, assignments, or test (Audio-graphics, n.d).

Audio-graphics provide the same advantages of audio-conferencing (two-way audio interaction and low set-up and operating costs,) while having an additional benefit of a visual aid for learners. The limitation of audio-graphics is that the visual aids such as text, slides, still video, images, CD-ROMs have to be distributed beforehand. For web-based aids, an Internet connection is required.

Kulik’s (1994) meta-analysis study revealed that, on average, student who used ICT-based instruction, scored higher and students also learned more in less time and liked their

classes more when ICT- based instruction was included. Fuchs and Woessman (2004) used international data from the Programme for International Student Assessment (PISA), they showed that while the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive, the correlation becomes small and insignificant when other student environment characteristics are taken into consideration.

## **METHODOLOGY**

### **Research Design**

The design adopted for this research is survey. According to Ali (2006), the survey research is that which is directed towards determining the nature of a situation as it existed at the time of investigation. He further described it as a type of research that studies large and small population by selecting and studying samples chosen from the population to discover the relative incidence, distribution, interrelations of sociological and psychological variables. Survey research as applied to this study was used to examine the interrelationships among variables and to draw explanatory inferences. In this study, the researcher sought to examine Teachers' Competence in Information and Communication Technology (ICT) and students' Academic Performance in Senior Secondary school in Eket LGA. through a structured questionnaire and a representative sample.

This study was carried out in Eket Local Government Area of Akwa Ibom State. Eket is one of the thirty one LGAs of Akwa Ibom State. It is located in the central part of Akwa Ibom State and it is precisely bounded in the north by Ibeno, to the east by Onna, south by Nsit-Ubium and west by Esit Eket. Eket has a total land area of 82km<sup>2</sup>. The people of Eket are mostly farmers who produce both cash and food crops such as cocoa, yam, groundnut and cassava. However, some are engaged in civil service jobs and commercial activities such as trading while others are businessmen. The choice of Eket L.G.A is predicated on the fact that ICT has been put to use in secondary schools and it afforded the researcher the ease to obtain data as he resides there.

### **Population of the study**

The population for this study was 1200 comprising 1000 students and 200 teachers obtained from ten (10) ICT based secondary schools in Eket Local Government Area.

### **Sample and sampling techniques**

The sample for this study was 270 respondents comprising 120 teachers and 150 students randomly selected from 10 selected secondary schools in Eket. The students are those in the senior secondary schools from the area of study.

### **Instrument for data collection**

Questionnaire is the main instrument of data collection for this study. The questionnaire had two parts. Part I measured the demographic characteristic of the respondents while part II measure the research variable according to the objectives that guided this study. The questionnaire was



structured on a four point scale of strongly agree, Agree, Disagree and strongly disagree with numerical values of 4, 3, 2, and 1 respectively.

The academic was obtained through an achievement test in English Language adopted from West African Examination Council (WAEC) Questions. The choice of WAEC questions was to use a standardized test that is valid over time.

### **Validity of the instrument**

To ensure the validity of the questionnaire, copies of the drafted questionnaire were given to three experts. Two of the experts were from the Department of Educational Technology and one expert came from the department of Measurement and Evaluation, university of Uyo, Akwa Ibom State. Their comments and observations were used to prepare the final copy of the questionnaire used for data collection in this study.

### **Reliability of the instrument**

According to Devellis (1991), as cited by Mugenda (2004), reliability is the proportion of variance attributable to the time measurement of a variable and estimates the consistency of such measurement over time from research instrument. It is a measure of the degree to which a research instrument would yield the same results or data after repeated trials.

In order to ensure reliability, the researcher issued the questionnaires to thirty respondents in Ikot Ekpene Local Government Area of Akwa Ibom State at an interval of two weeks. The result of the first and second trial test were analyzed using Pearson Product Moment Correlation and an estimate of 0.86 was obtained.

### **Procedure for Data Collection**

The instrument for data collection was administered to the respondents directly by the researcher. The respondents were visited by the researcher after obtaining necessary permission from the head of the institutions. All the copies of questionnaire administered were retrieved after completion resulting in a 100% return rate.

### **Method of Data Analysis**

The data collected was coded and analyzed using Population t-test to test null hypothesis one while Pearson Product Moment Correlation was used to test hypotheses two to 5 at .05 level of significance. The analysis was achieved using SPSS version 20.

## **RESULTS**

### **General Description of Variables**

In this section the main variables of the study are identified by their mean and standard deviation calculated and presented. The major demographic information was represented by category of respondent represented by teachers (45%) and students (55%). Other research variables are competency level of teachers, use of audio-cassette tapes, video-tapes, web-based training and

audio-conferencing and academic performance of Students in English Language. The means and standard deviations of research variables is presented in Table 1.

Table 1: General description of variables

| S/N | Variable   | $\bar{X}$ | SD   |
|-----|--|-----------|------|
| 1.  | Competency level of teachers                         | 14.36     | 1.86 |
| 2.  | Use of audio-cassettes in teaching                   | 14.38     | 2.01 |
| 3.  | Use of video tapes in teaching                       | 16.62     | 1.97 |
| 4.  | Use of web-based training                            | 15.83     | 2.16 |
| 5.  | Use of audio-conferencing                            | 16.32     | 2.05 |
| 6.  | Academic performance of students in English Language | 31.82     | 4.83 |

Note:  $\bar{X}$  = Mean; SD = Standard deviation

### Hypothesis one

In the null form, the hypothesis states that the competency level of teachers in the use of ICTs in Eket L.G.A is not significantly high. To test this hypothesis, Population t-test for single mean was used and the result is presented in Table 2.

Table 2: Population t-test for single mean to determine the competency level of teachers in the use of ICTs

| Variable  | N   | $\bar{X}$ | $\mu$ | SD   | t-cal  |
|---|-----|-----------|-------|------|--------|
| Competency level of teachers in the use of ICTs | 270 | 14.36     | 12.50 | 1.86 | 16.90* |

Significant at .05; df = 269; critical t = 1.960

The data in Table 2 revealed that the calculated t-value was 16.90. This value is greater than critical table value of t (1.960) at .05 level of significance and 269 degree of freedom. With this result, the null hypothesis was rejected. This implies that competency level of teachers in the use of ICTs is high in the study area.

### Hypothesis Two

In the null form, the hypothesis states that there is no significant relationship between teachers use of audio-cassette in teaching and academic performance of students in English Language in Eket L.G. Pearson Product Moment Correlation analysis was used to analyze the data at .05 level of significance. The result of the analysis is presented in Table 3.

Table 3: Pearson product moment correlation analysis of the relationship between use of audio-cassette tapes in teaching and academic performance of students in English Language

| Variables  | N   | M     | SD   | r-value | Sig   |
|--|-----|-------|------|---------|-------|
| Use of audio-cassette tapes in teaching              | 270 | 14.38 | 2.01 | 0.671*  | 0.02* |
| Academic performance of students in English Language | 270 | 31.82 | 4.83 |         |       |

\*\*Significant at .05 level, df = 268, critical r= 0.195

The result in Table 3 reveals that the calculated r-value 0.671\* is greater than the critical r-value of 0.195 at .05 level of significance with 268 degree of freedom. With this result, the null hypothesis which states that there is no significant relationship between teachers use of audio-cassette in teaching and academic performance of students in English Language in Eket L.G is rejected. This implies that there is significant relationship between use of audio-cassette in teaching and academic performance of students in English Language in the study area. Thus, the use of audio-tapes in teaching by teachers has potentials to influence academic performance of students in English Language among other subjects in secondary schools.

### Hypothesis Three

In the null form, the hypothesis states that teachers' use of video-tapes in teaching does not significantly relate with academic performance of students in English Language in Eket L.G.A. Pearson Product Moment Correlation analysis was used to analyze the data at.05 level of significance. The result of the analysis is presented in Table 4.

Table 4: Pearson product moment correlation analysis of the relationship between teachers' use of video-tapes in teaching and academic performance of students in English Language

| Variables  | N   | M     | SD   | r-value | Sig   |
|--|-----|-------|------|---------|-------|
| Teachers' use of video-tapes in teaching             | 270 | 16.62 | 1.97 | 0.512*  | 0.00* |
| Academic performance of students in English Language | 270 | 31.82 | 4.83 |         |       |

\*\*Significant at .05 level, df = 268, critical r= 0.195

The result in Table 4 reveals that the calculated r-value 0.512\* is greater than the critical r-value of 0.195 at .05 level of significance with 268 degree of freedom. With this result, the null hypothesis which states that teachers' use of video-tapes in teaching does not significantly relate with academic performance of students in English Language in Eket L.G.A is rejected. This implies that there is significant relationship between teachers' use of video-tapes in teaching and academic performance of students in English Language in the study area. Thus, teachers' use of video-tapes in teaching has potentials to influence academic performance of students in English Language among other subjects in secondary schools.

### Hypothesis four

In the null form, the hypothesis states that there is no significant relationship between teachers' use of web-based training and academic performance of students in English Language in Eket L.G.A. Pearson Product Moment Correlation analysis was used to analyze the data at.05 level of significance. The result of the analysis is presented in Table 5.

Table 5: Pearson product moment correlation analysis of the relationship between teachers' use of web-based training and academic performance of students in English Language

| Variables  | N   | M     | SD   | r-value | Sig   |
|--|-----|-------|------|---------|-------|
| Teachers' use of web-based training                  | 270 | 15.83 | 2.16 | 0.540*  | 0.01* |
| Academic performance of students in English Language | 270 | 31.82 | 4.83 |         |       |

\*\*Significant at .05 level, df = 268, critical r= 0.195

The result in Table 5 reveals that the calculated r-value 0.540\* is greater than the critical r-value of 0.195 at .05 level of significance with 268 degree of freedom. With this result, the null hypothesis which states that there is no significant relationship between teachers' use of web-based training and academic performance of students in English Language in Eket L.G.A is rejected. This implies that there is significant relationship between teachers' use of teachers' use of web-based training and academic performance of students in English Language in the study area. Thus, teachers' teachers' use of web-based training in teaching has potentials to influence academic performance of students in English Language among other subjects in secondary schools.

### Hypothesis five

In the null form, the hypothesis states that teachers' use of audio-conferencing in teaching does not significantly relate with academic performance of students in English Language in Eket L.G.A. Pearson Product Moment Correlation analysis was used to analyze the data at.05 level of significance. The result of the analysis is presented in Table 6.

Table 6: Pearson product moment correlation analysis of the relationship between teachers' use of audio-conferencing in teaching and academic performance of students in English Language

| Variables  | N   | M     | SD   | r-value | Sig.  |
|--|-----|-------|------|---------|-------|
| Teachers' use of audio-conferencing in teaching      | 270 | 16.32 | 2.05 | 0.722*  | 0.02* |
| Academic performance of students in English Language | 270 | 31.82 | 4.83 |         |       |

\*\*Significant at .05 level, df = 268, critical r= 0.195

The result in Table 6 reveals that the calculated r-value 0.722\* is greater than the critical r-value of 0.195 at .05 level of significance with 268 degree of freedom. With this result, the null hypothesis which states that audio-conferencing in teaching does not significantly relate with academic performance of students in English Language in Eket L.G.A is rejected. This implies that there is significant relationship between audio-conferencing in teaching and academic performance of students in English Language in the study area. Thus, audio-conferencing in teaching has potentials to influence academic performance of students in English Language among other subjects in secondary schools.

## **DISCUSSION**

### **Competency level of teachers in the use of ICTs in teaching**

The result of the test of hypotheses for this section of the study showed that the competency level of teachers in the use of ICTs in the study area is high. This follows that they are knowledgeable and skilful in the use of ICTs in teaching that could bring the desired changes in the academic performance of students in the school environment. This finding agrees with UNESCO ICT Competency Framework for Teachers (2018), teachers need to harness ICT to guide learners in developing knowledge, society skill such as critical and innovative thinking, complex problems solving, the ability to collaborate, and socio-emotional skills. Teacher training and continued on-going, relevant professional development for teachers are essential if benefit from investment in ICT are to be realized. Bransford and Williams (1990) also stated that learning environments need to reflect the potential uses of knowledge that students are expected to master, in order to prevent the acquired knowledge from becoming inert

### **Use of audio-cassette tapes in teaching and academic performance of students in English Language**

The result of the test of hypotheses for this section of the study showed that the there is significant relationship between use of audio-cassette in teaching and academic performance of students in English Language in the study area. The finding agrees with Stoddart and Niederhauser (1993) who stated that audio- cassette tape is interactive in nature and explained that that this type of learning process is much more effective than the monotonous monologue classroom situation where the teacher just teaches from a raised platform and the students just listen to teacher. ICT changes the characteristics of problems and learning tasks, and hence play an important task as mediator of cognitive development, enhancing the acquisition of generic cognitive tools (Reeves & Jonassen, 1996).

### **Use of video tapes in teaching and academic performance of students in English Language**

The result of the test of hypotheses for this section of the study showed that the there is significant relationship between use of video-tapes in teaching and academic performance of students in English Language in the study area. The finding agrees with Albert Bandura, Girasoli and Hannafin (2008) who encouraged the use of asynchronous CMC tools to promote student self-efficacy and hence academic performance. Fister et al. (2008) also depict the power of tablet PCs to improve mathematics instruction. ICTs have the potential for increasing access to and improving the relevance and quality of education. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. Student using ICTs for learning purpose becomes immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Reeves & Jonassen, 1996), the influence of the technology on supporting how student learn will continue to increase.

## **Use of web-based training and academic performance of students in English Language**

The result of the test of hypotheses for this section of the study showed that there is a significant relationship between use of web-based training in teaching and academic performance of students in English Language in the study area. The finding agrees with WebCT (2002) that stated that web-based Platforms decrease developmental time; reduce skill requirement for developing learning materials; reduce development cost; provide consistency in format; facilitates maintenance and support; updating is done by suppliers. ICT helps students in learning by improving communication between the learners and the instructors (Valasidou & Bouzios, 2005). The World Wide Web (WWW) also provides a virtual international gallery for students' work (Loveless, 2003).

## **Use of audio-conferencing in teaching and academic performance of students in English Language**

The result of the test of hypotheses for this section of the study showed that there is a significant relationship between use of audio-conferencing in teaching and academic performance of students in English Language in the study area. The finding agrees with Kulik's (1994) meta-analysis study revealed that, on average, student who used ICT-based instruction, scored higher and students also learned more in less time and liked their classes more when ICT-based instruction was included. Fuchs and Woessman (2004) also used international data from the Programme for International Student Assessment (PISA), they showed that while the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive, the correlation becomes small and insignificant when other student environment characteristics are taken into consideration.

## **Implications of the Study**

The study revealed that competency level of teachers in the use of ICTs is germane to effective teaching of contents more so that the world has become digitalized. This important lesson learned implies a clarion call on teacher to move out from their analogue status to embrace ICT in order not to be caught in the web of change as it concerns ICT and education of [f students.

High academic performance of students in English Language generally and other subjects by extension is positively influence through the use of ICTs in teaching. This has serious implication for teaching now and in the future. Utilization of ICTs in teaching breeds effectiveness and must be encouraged and utilized at all levels of secondary education in the State. This should be viewed seriously to ensure that students are given the training that is competitive to other parts of the world. Stakeholders in the education ministry and non-governmental organization are to be involved in the direction as ICTs facilities are capital intensive.

Furthermore, the lessons learned from the relevance of ICTs to teaching have implication for government recruitment process. Teachers' competence in ICTs utilization should constitute a core requirement on recruitment of new teachers in order not sustain the tempo and grow secondary education for effective results.

## CONCLUSION

Based on the results of this study, it was concluded that competency level of teachers in Eket Local Government Area is high. It was further concluded that use of audio-cassette tapes, video-tapes, web-based training and audio-conferencing in teaching significantly relate and influence academic performance of students in the study area.

## Recommendations

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

- Government should continue to ensure that the competency level of teachers in secondary schools in ICTs utilization is sustained over time in Eket Local Government Area through in-service training.
- The Ministry of Education should ensure that ICT facilities are procured to specification in secondary schools in Eket Local Government Area.
- They should be regular supervision by the Ministry of Education to ensure that ICT facilities are judiciously used in teaching the students.
- School administrators should be encouraged to provide enabling environment for the use of ICTs in secondary schools in Eket LGA.

## REFERENCES

- Al-Ansari S. H. (2006). Hepp, Hinostrza, Laval and Rehbein (2004). The Dynamics of Technologies for Education.
- Alexander, G. C., & Jonassen, (1999). Teacher Education and the Professional Growth of the 21st Century Nigeria Teacher. The African Symposium, 3
- Alexander, S. (1999). Benefits of using Information Communication Technologies (ICT) for Teaching and Learning in K-12/13 Classrooms. Schoolnet.
- Ali, A. (2006). *Conducting research in education and the social sciences*. Tian Ventures.
- Alibi, E. (2004, April 30). Evolving role of ICT in teaching, research and publishing. *Nigerian Tribune*, 30-31
- Arnutabi, A., & Oketch, J. H. (2003). E-Education in Nigeria: Challenges and prospects. Proceedings of the 8th UNICT Task Force Meeting April 13-15, Dublin, Ireland.
- Anya, Anya O., (2001). The dream, vision and myth of Nigeria reality. The Guardian Online, June 19, 2001.
- Attwell, G. (1999). *CDEFOP research resource base on ICTs and vocational education and training: An introduction and guide*. CDEFOP: Germany p1.
- Awe, W. (2000). *Management Information Systems*. Lagos: Gilgal Publications. 12-40
- Barad, D. P. (2009). Experimenting ICT in Teaching English Language and Literature. *Asia calls online Journal*, 4(1).
- Barker, A. & Wendel, K. T. (2001). Implementation of ICT in Educational Curriculum to Enhance Learning in Primary and Secondary Schools in Anambra State. *Approaches in International Journal of Research Development*, 4(1), 169-177.

- Barron, D. F. (1998). Benchmarking the Motivational Competencies of Academically Qualified Teachers and Professionally Qualified Teachers in Nigerian Secondary Schools. *African Symposium Journal of Africa Educational Research Network*, 5, 17-37.
- Benjamin, Osisoma (1986). Comprehensive Review notes in Business Management. Educational Publishers.
- Berge, C. (1998) Integrating ICT in teacher training: Reflection on practice and policy implications- A case study of the Learning Resource Centre at the Kenya Technical Teachers College.
- Bhattacharya, B., & Sharma, I. F. (2007). *Approved number of facilities in educational institution colleges*. Federal Ministry of Education.
- Bond, N. (2002). Computer simulations in the high school: Students' cognitive stages, science process skills and academic achievement in microbiology. *International Journal of Science Education*, 24(8), 8-21.
- Bottino, L. G. (2003). The role of ICT in science education. *Cambridge Journal of Education*, 32(2), 219-232.
- Breuleux, S. R., K. Laferrie're, & Lamon, V. S. (2002). An Evaluation of the National Teachers Institutes Manpower Training Programme for Teaching Personnel in Mid-Western Nigeria. *International Education Journal*, 5, 405-409.
- Cabero M. (2001), Literature review in primary Science and ICT. NESTA Futurelab Series, Bristol: NESTA Futurelab. <http://www.nestafuturelab.org/research/reviews/psi01.htm>.
- Calderoni, U. Y. (1998). Literature review in science education and the role of ICT: Promise, problems and future directions. NESTA Futurelab series. NESTA Futurelab. <http://www.nestafuturelab.org/research/reviews/sc01.htm>.
- Calvert, A. F. (1986). Does the use of ICT affect quality in learning science at Key stage 3? *Studies in Teaching and Learning*, 8, 9-17.
- Cavanaugh, H. (2001). Manual for Pilot Testing the Use of Indicators to Assess Impact to ICT Use in Education.
- Chamber, T. (2003). A Model for pedagogical and curricula Transformation for the Integration of Technology in Middle School Science: Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, St. Louis, MO, March 25-28, 2003.
- Cholin, A. (2005). *School Net Nigeria*. Federal Ministry of Education.
- Coates, et al. (2004). Obstacles confronting technology initiative as seen through the experience of science teachers: A comparative study of science teachers' belief, Planning and practice. *Journal of Science Education and Technology*, 8(4), 291-307.
- Collins, S. (1996). Investigation into Teachers Self-Efficacy in Implementing Computer Education in Nigerian Secondary Schools. *Meridian: A Middle School Computer Technology Journal*, 8(2).
- Cookson, J. C. (1989). Communication and Administrative Effectiveness of Principals of Secondary schools in South Western, Nigeria. Unpublished PhD Thesis University of Ado-Ekiti, Nigeria. 86-102.
- Dalen, N., & Britell H. (1960). Reforming Ghanaian Teacher. Education towards preparing an Effective Pre-Service Teacher. *Journal of Education for Teaching*, 31, 99-110.
- Dees, M. (1994). *Essentials of Communication in Business*. Adio Publishers.
- Dewey, John (1944). *Democracy and Education*. The free Press.



- Dike, V. (2003). The Universal Basic Education Program: Educating the Educators in Nigeria. <http://www.Nigcriaworld.com>.
- Dox, J. A. (1992). *The Development of Secretarial profession in Nigeria*. McMillian.
- Duffy, B. J., & Cunningham, S. (1996). *Research Methods and Theses Writing in Educational Studies*. New Haven Publishers.
- Dustman, O. C. (1998). *Computer Application in Health Care*. University Government Printing Press.
- Dean, K. (2000, August 17). Iconoclast Says Show, Don't Tell. *Wired News*. Retrieved December 14, 2019, from <http://www.wired.com/news/culture/0,1284,38169,00.html>.
- Dock, A., Helwig, J., Adkins, D., Mayo, J., Leigh, S., & Cash, F. (1999). *Interactive Radio Instruction: Impact, Sustainability, and Future Directions*. [http://wbIn0018.worldbank.org/HDNet/HDdocs.nsf/view+to+link+webpages/54C6D48C696385268525694B007529A8/\\$FILE/1810.pdf](http://wbIn0018.worldbank.org/HDNet/HDdocs.nsf/view+to+link+webpages/54C6D48C696385268525694B007529A8/$FILE/1810.pdf).
- Effiom, M. N. (1997). Lecture Notes on Data Processing Unpublished Lecture Note. Calabar Computer Centre Calabar.
- Emerson & Taylor (2004). Mandatory computer education in Nigeria secondary schools: Prospects and problems. *Journal of Educational Research and Evaluation*, 3(2), 32-38.
- Etmer, T. & Newby, J. (1993). Educational planning. A turning point in education and development in Nigeria, Inaugural Lecture Series 58 University of Benin. Benin City.
- Flecknoe, A. (2002). Schools Management. A paper presented at the Seminar/Workshop for Principals in Public post-primary institutions in Delta State, Asaba and Efurun. 9 -10 Jan 200 1.1-8.
- Foray, D. (2004). *The Economics of Knowledge*. MIT Press.
- Fuglestad, A. B. (2005). Students' use of ICT tools: Choices and reasons. Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Education Vol. 3, 1-8.
- Greggs, F. I. (1960). *Applied Secretarial Practice 6th Edition*. University Press.
- Hannafin, I. J., Hall, T., & Land, G. F. (1994). Impact of information and Communication Technology (ICT) on Teacher Education in Ikere. *Journal of Education, Ikere Ekiti*, 5, 169-175.
- Haddad, W. D. & Draxler, A. (2002). The dynamics of technologies for education. In W. D. Haddad & A. Draxler (Eds.), *Technologies for education potentials, parameters, and prospects*, 1. (pp. 2-17). Prepared for UNESCO and AED by Knowledge Enterprise Inc.
- Hampton, C. (2002). Teaching practical skills. In Mishra, A. & Bartram, J. (Eds.) *Perspectives on distance education: Skills development through distance education*. Retrieved October 28, 2019, [http://www.col.org/skills/Skills\\_Development.pdf](http://www.col.org/skills/Skills_Development.pdf).
- Hampton, C., & Bartram, J. (2002). Delivering the programme. In Mishra, A. K., & Bartram, J. (Eds.), *Perspectives on distance education: Skills development through distance education*. [http://www.col.org/skills/Skills\\_Development.pdf](http://www.col.org/skills/Skills_Development.pdf).
- Hawkins, R. J. (1998). *Ten lessons for ICT and education in developing World Banks development indicators*, World Bank, New York: Dover [http://www.oss.buffalo.edu/Services/dialin/isdn\\_hardware.html](http://www.oss.buffalo.edu/Services/dialin/isdn_hardware.html).
- ISDN Home User Hardware (2000). Retrieved January 28, 2019 from the World Wide Web:
- ICT and Distance Education in Nigeria: A Review of Literature and Accounts. <http://www.dolubc.com/art5.pdf>.
- Jennings, L. N. (1983). *Secretarial and Administrative Procedures*. London: Africana University-Press.

- Jonassen, o., Peck, I. k., & Wilson, D. (1999). Designing a MIS for Effective Secondary School Administration in Nigeria in Special Education on Information Communication Technology (ICT) IKEJE. 13 8-143.
- Kearsley, J. (2000). Information Communication Technologies in Teachers Training and Professional Development in Nigeria. *Turkey Journal of Distance Education*, 8, 133-142.
- Keegan S. (1996). Effects of two instructional methods on senior secondary school students' perception of the difficult in learning some chemical concepts and their achievement gains. *Journal of Educational Foundations and Management*, 1(1), 5 5-68.
- Kennewell, Parkinson, Tanner, 2000; OTA, (1995). The Relevance of Information and Communication Technology in the Teaching of Physical Education and Sports in Special Edition on ICT, IKEJE pp. 93-98.
- Kozma, G. (2005). Computer Science Education for Tertiary Instructions. Niyi Commercial and Printing Ventures.
- Kurmar, B. N. (2001). Relevance of Information and Communication Technology (ICT). *Education in Ikere Journal of Education Ikere Ekiti*, 9(1), 37-42.
- Keizer, G. (2001). *The broadband breakdown*. <http://www.cnet.com/internet/0-3762-8-7287680-1.html?tag=st.is.3762-8-7287680-4.back2.3762-8-7287680-1>.
- Kwacha, P. Z. (2001). The imperative of information and communication technology for technology in Nigeria. *MOFLOT Journal of Online Learning and Technology*, 3(4), 10-15.
- Lim & Chai, C. II. (2004). *National Policy on Education*. Federal Government Press.
- Long, (2001; Wood, 2004). *Educational research: competencies for analysis and application*. Prentice-Hall.
- Law, N., Pelgrum, W. I., & Plomp, J. (2008). *Pedagogy and ICT use in schools around the world: Findings from The IFA SITES 2006 Study*. Springer.
- Lizardi, A. (2002). ICTs and non-formal education: Technology for a brighter future? *Techknowlogia*, 4(4).
- Mandara, B. (2012). Utilization of information and communication technologies (ICT) in the teaching of office education graduates in Adamawa State tertiary institutions. *Journal of Education and Policy Review*, 4(1), 1-9
- Nunes, C. A. A., & Gaible, E. (2002). Development of multimedia materials. In W. D. Haddad & A. Draxler (Eds.), *Technologies for education potentials, parameters, and prospects*, 7. (pp. 94–117).
- Nwosu, O., & Ogbomo, E.F. (2012). ICT in education: A catalyst for effective use of information. *PNLA Quarterly: The Official Publication of the Pacific North West Library Association*.
- Odiari, A. U. (1997). *Management information system: Principles and design*. Enugu: Glanic Venture,
- Oujo, M. (1999). RADIO-wiring the schools with wireless. *Techknowlogia*, 1(1), 26–28. Retrieved [http://www.techknowlogia.org/TKL\\_active\\_pages2/CurrentArticles/main.asp?File](http://www.techknowlogia.org/TKL_active_pages2/CurrentArticles/main.asp?File).
- Paltridge, S. (2001). *The development of broadband access in OECD countries*. Retrieved February 18, 2019 from the OECD web site: <http://www.oecd.org/pdf/M00020000/M00020255.pdf>
- Pelgrum, W. I. (2001). Obstacles to the integration of ICT in education: Results from a world
- Perraton, H., Creed, C., & Robinson, B. (2002). *Teacher education guidelines: Using open and distance learning*. <http://unesdoc.unesco.org/images/0012/001253/125396e.pdf>.
- Rao, V. (1994). *Audio teleconferencing – A technological prescription for interactive learning*. <http://www1.worldbank.org/disted/Technology/interaction/audioconf01.html>.
- Rusten, E., & Hudson, H. E. (2002). Infrastructure: Hardware, networking, software, and connectivity. In W. D. Haddad & A. Draxler (Eds.), *Technologies for education potentials, parameters, and prospects*, 6. (pp. 76–93).
- Sadker, M. P., & Sader, D. M. (2003). *Teachers' school and society*. Megraw Hill.

- Stevens, G. (2001). *Distance learning for Technical and Vocational Education in Sub-Sahara Africa*. The World Bank. <http://www.gtz.de/wbf/bibliothek/detail.asp?number=1431>.
- UNESCO (2018). *Teacher Education through Distance Learning: Technology, Curriculum, Evaluation, Cost*. UNESCO.
- UNESCO, (2002). *The UNESCO ICT in education programme*. United Nations Educational, Scientific and Cultural Organization. UNESCO.
- UNESCO, *Education for all Monitoring Report (2008), Net Enrolment Rate in primary: education*.
- WEBCT® CAMPUS EDITION 3.8 *Getting started Tutoria*. (2002). <http://www.webct.com/service/ViewContent?contentID=10800037>
- Wedemeyer, S. (1981). *Internet access in public schools: (1994-1999) NCES 2000-86*. U.S. Department of Education. Washington, DC: National Center of Education statistics.
- Wiweharuck, C. (1998). *ICT and the Dynamics of University Education. Approaches in International Journal of Research Development, 4(1), 260- 271*.
- Yusuf, N. (2005). *The Implications of ICT and NKS for science Teaching; Whiter Nigeria*”
- Yaskin, D., & Gilfus, S. (2002). *Introducing the blackboard 5: Learning system*. <http://company.blackboard.com/docs/cp/orientation/EnterpriseLearningWhitePaper.pdf>.