INFLUENCE OF ICT KNOWLEDGE ON TEACHERS' EFFECTIVENESS AND STUDENTS' ACADEMIC ACHIEVEMENT IN PUBLIC SECONDARY SCHOOLS IN OWERRI NORTH L.G.A

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Abstract

This study investigated the influence of information and communication technology knowledge on teacher's effectiveness and students' academic achievement in public secondary school in Owerri North LGA of Imo State. The research design adopted for this study was a descriptive survey design. Four research questions guided the study. The population of the study comprised all students and teachers in Owerri North L .G .A, giving a total of seven thousand, three hundred and thirty three (7333) (Six hundred and sixty six teachers (660) and six thousand, six hundred and sixty seven students 6607). The sample size for the study comprised three hundred and fifty (350) respondents, randomly drawn from the study population. The instrument for data collection was the researchers constructed questionnaire titled "ICT knowledge and Teachers Effectiveness and Academic Achievement Questionnaire" (IKTEAAAQ).The instrument was face and content validated by two experts in information and communication technology, and an expert in Measurement and Evaluation all from Alvan Ikoku Federal University of Education Owerri. Reliability of the instrument was ascertained using a test re-test method of an interval of two weeks. Thereafter, the two sets of scores generated were correlated using Pearson's Product Moment Correlation Statistics and reliability index of 0.86 was obtained. The data collected was analyzed using mean statistics. The findings revealed that adequate knowledge ICT is relevance for teacher's effectiveness in public secondary schools. The findings of the study also showed that, teacher's attitude towards the use of ICT in public secondary schools in Owerri North was positive. The study also revealed that to a large extent, teacher's effective use of ICT promotes student's academic achievements. Based on the findings, the researchers recommended among others that government should provide and equip all the public secondary schools with appropriate and relevant ICT equipment to aid teaching and learning. Government and

stakeholders in education should organize computer units manned by experts in all secondary schools within Owerri North L.G.A.

Key words: Influence, ICT Knowledge, Teacher Effectiveness and Academic Achievement

Introduction

It has been found that despite the global need for Information and Communication Technology (ICT) in various sectors over the last decade including education, most Nigerian teachers and students are still faced with the problem of accessing and using some of the ways and styles of teaching and learning with computer. Even when there is high demand of ICT knowledge for teaching and learning to be, effective, efficient, meaningful and interesting, studies revealed that teacher's ICT competence in Nigeria is still below expectation and ICT resources like the internet, and computer are mostly limited both in secondary and tertiary level of education.(Nwosu, 2022). Ike, (2022), reported that lecturer's perception of the role of ICT in management of University education was significantly low and this affects the level of job efficiency in the classroom teaching, communication, students' record keeping, research and publications. Some students have access to computer and internet outside the school setting but have none in the school. Thus classroom are still very much traditional without much influence on ICT. The change from teacher-centered education system to learner centered education in the world in the past few years has demanded for the use of ICTs in education. Hawkins, (2020); Ertmer & Otternbreit-Leftwich, 2021), noted that education reform practices should focus on equal access and quality of education which should highlight the importance of change in the education sector through the use of ICTs and equipping new generations with enhanced skills to operate in the 21st century (Nwachukwu, 2021).

The exponential growth of information that is available anywhere to anybody and the ability to access and share this information regardless of the user's physical location have transformed the way in which people work, organize, socialize, create, participate in public forums and use their free time (Castells, 2019). Incorporating ICT has become a very important priority in the education sector. These technologies can contribute to universal access to education, equality in instruction, quality in teaching and learning and the professional development of teachers, as well as to more efficient management and administration of education systems. Thus, they are essential to achieving more egalitarian societies (UNESCO, 2021).With the introduction of Information Communication Technology (ICT) to align with the global best practices, ICT occupied a central stage in the senior secondary school curriculum in order to present the total experiences to which all teachers and learners must be exposed and through which the content and performance objectives of the subject must be achieved for both teachers and

learners. Also, the provision of teaching and learning materials for any subject should be enhanced for effective teaching and learning. These could be possibly realized if the teachers and learners can effectively integrate ICT into the classroom (Abudulraheem, 2019). Olelewe and Amaka (2020), asserted that a good teacher can use various teaching and learning technologies (such as computer, internet and multimedia resources) which are increasingly being used in support of the teaching and learning process in presenting new challenges and opportunities for teachers and students to translate information into relevant knowledge that a student can understand, retain and pass on to others under a conducive school environment.

Today, the adventure and advancement of new technologies (ICT) has challenged the traditional method and process of teaching and learning and have also changed the way education is managed to a more flexible, friendly and simplified form. The United Nation Education Scientific and Cultural Organizations (UNESCO, 2021) stressed that ICT has turned from being a technology of communication and information alone, to a curriculum creation and delivery system for educators and learners. For Schiller and Tillett (2019), ICT enhances possibility by providing what teachers are able to do, by providing an entry point into the content and enquiries that were not possible without the use of ICT, by extending what students are able to produce and as a result of their investigations and by providing teachers with the opportunities to become learners again. It has made it possible for complicated collaborative activities of teaching and learning by dividing it in space and time with seamless connectivity between them (Olelewe & Amaka, 2020).

Folorunsho, Longe and Ijere (2021) asserted that Information Communication Technology (ICT) involves the use of hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images etc.) as well as related services. According to Obanya (2020), ICT is a broad term that has to do with the harnessing of process, the methods and the product of electronic communication related technologies and other related resources in today's' knowledge driven society, for enhancing the productivity, the spread and efficiency of set programme activities geared towards the achievement of clearly defined goals. ICT and IT (Information Technology) are often used synonymously. However, the key difference is that IT is a subset of ICT which covers all forms of communication including telephone mobiles etc. while information technology (IT) refers to an entire industry that uses computers, networking, software and often equipment to manage information (Sang & Alexander, 2021).

United Nation Educational Scientific and Cultural Organization (UNESCO, 2019), defined ICT as the combination of all the computers, telecommunication and media technologies. They are also electronic technologies used for accessing, processing,

gathering, manipulating and presenting or communicating information in education system. Ogunsola (2019) poised that ICT "is an electronic based system of information transmission, reception, processing and retrieval, which has drastically changed the way we think, the way we live and the environment in which we live". Lomark (2019) defines information and communication Technology as the use of electronic equipment especially the computer for storing, analyzing and distributing information of all kinds including words, numbers and pictures. It can be used to access global knowledge and communication with other people. Information and Communication Technology (ICT) is defined as electronic media, devices and application used in the classroom to aid effective teaching and learning processes (Ibrahim, 2018). All such materials, media and devices provided by ICT which appeal to all the senses and feeling and learning constitute teaching and learning materials. The materials help teachers communicate effectively to the students so that learning is facilitated. This is an exciting method of technological developments incorporated into the Nigeria classroom so well implemented as to enable teachers and students to do what has been impossible in the educational system (Osuala, 2019). It was further buttressed that teachers and students will be able to assimilate the new machinery and its skill requirements. The development of ICT into the schools system will have effect upon the technological "revolution" expected in business and economic environments and the global society. The use of ICT has been found to assist students in accessing digital information efficiently and effectively. As Brush, Glazewski and Hew (2020) have stated, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. Edozie and Mozie (2019) explained that Information and Communication Technologies (ICTs) empowerment enhances the abilities of people to use ICT to improve their life skills and strengthen their capabilities. Such empowerment could be facilitated awareness and motivation for ICTs. Umunadi (2019) added that the role of information and communication technologies in teaching and learning is rapidly becoming one of the most important widely discussed issues in senior secondary schools in Nigeria. In another view, Obanya (2020) opined that secondary schools in Nigeria must strive to meet common 21st century challenges of providing student with an education that is viewed by the general society as relevant and valuable; and that teaching and learning must be driven by ICTs for effectiveness.

Ogwo (2020) noted that the use of ICT in teaching and learning in senior secondary school today can assist in reducing the teachers' workloads through its use for lesson preparation, instructional delivery as well as teaching and learning evaluation. He further buttressed that secondary school teachers will become learning facilitator, collaborator, coach, mentor, knowledge navigator and co-learner and not only a dispenser of knowledge. The educational reform policies were aimed at integrating the use of ICT tools in the Nigerian school system. Wadi and Sonia (2020), opines that proper and

effectiveness of information and communication technology tools in Imo State secondary schools will definitely improve the quality of education in several ways such as increasing teachers' motivation and engagement, facilitating the acquisition of learner's basic knowledge and skills and also to enhance teachers training. Fajama (2020) stressed that the effectiveness and success of an institution lies on the quality of people (teachers/learners) who form and work within the institution. This is an exciting method of technological developments incorporated into the Nigeria classroom so well implemented as to enable teachers and students to do what has been impossible in the educational system (Osuala, 2019). It was further buttressed that teachers and students will be able to assimilate the new machinery and its skill requirements. The development of ICT into the schools system will have effect upon the technological "revolution" expected in business and economic environments and the global society. The use of ICT has been found to assist students in accessing digital information efficiently and effectively. As Brush, Glazewski and Hew (2020) stated that, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process.ICT makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of ICT. It gives support for student-centered and self-directed learning. Students are now more frequently engaged in the meaningful use of computers (Castro, Sánchez & Alemán, 2021).

It is important to note that adequate knowledge of ICT will no doubt promote teacher effectiveness and students' academic achievement. Teacher effectiveness is all it takes to ensure good student outcome. According to Hawthrone (2022) effective teaching is the knowledge, strategies, process and behaviours which lead to good student outcomes. Taylor and Thion (2022) described teacher effectiveness as teachers' contributions towards student gains in achievement. Effective teaching helps students to achieve their goals academically. It also helps to improve teacher- student relationship. Hawthrone (2022) identified some characteristics of an effective teacher as: creating conducive environment for learning to take place, effective classroom management, effective communication skills, knowledge of subject matter, Motivation, positive relationship with students.

Creating a Conducive Learning Environment: Positive and purposeful learning environment can help to improve any other strategies an effective teacher uses to improve student wellbeing and achievement. For any teaching strategy to be effective, students' physical, social and emotional learning environment must support their needs and promote positive outcomes (Indeed Editorial Team, 2023). Teachers can help to create a positive learning environment by establishing clear classroom rules and procedures, embracing comfortable seating arrangements, maintaining an environment that promotes

respect, inclusivity and diversity, and encouraging students to receive and accept constructive feedback (The U Lesson Group, 2024).

Having Strong Communication Skills: Effective communication skills, will help the teacher to build and maintain positive working relationships with students as well as members of the wider school community. As we know good relationships can improve progress and achievement. Skills such as active listening can be used to help build trust and make young people feel valued and appreciated (Esezi, 2020). Rosalyn (2020) states that poor communication skill promotes poor teaching method thus cause students comprehensive level to drop and may affect academic progress negatively. Teachers' teaching method is another variable is important in this study. Ipem, Eluemuno and Onah (2022) found that poor academic performance by majority of students was linked to teaching methods used by teacher. Isa, Mammam, Badar and Bola (2020) states that use of students' center methods enhances active learning, interest and critical thinking among pupils,

Academic achievement is the extent to which student has achieved either short or long term educational goals. Academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals were focus of activities in instructional environments, specifically in school, college and university (Richard, Anja, Anne and Linda 2014)

The educational reform policies were aimed at integrating the use of ICT tools in the Nigerian school system (Abbott & Faris, 2020). The Federal Ministry of Education National Policy for Information Communication and Technology (FME, 2019) emphasizes three major needs for the implementation of ICT tools in education as follows: to empower the students with ICT skills, to prepare the students for competitiveness in a global environment, integrate ICT into the mainstream of education and training and establishment of multifaceted ICT institutions, as centers of excellence (Brich &Irvine, 2019)

The document specifically noted the need for restructuring the educational system at all levels to respond effectively to the challenges of the 21st century where the global life is been digitalized. For the above listed objectives to be meaningfully realized, it means that ICT tools must be properly, effectively and judiciously utilized in the teaching and learning processes in secondary schools in Owerri North L.G.A areas of Imo State. Wadi and Sonia (2020), opines that proper and effectiveness of information and communication technology tools in Imo State secondary schools will definitely improve the quality of education in several ways, such as increasing teachers' motivation and engagement, facilitating the acquisition of learner's basic knowledge and skills and also to enhance teachers training.

Statement of the Problem

In Nigeria today, there is an increasing need to adopt ICT into teaching and learning activities in secondary schools. Access to wide range of information, books, ideas, data and innovations in the world today through the deployment of ICT has highlighted the importance of necessary knowledge and skills in ICT by both teachers and students to achieve classroom objectives. Basically, the deployment of ICT in academic activities has made teaching and learning more productive, creative and easier. Government at various levels in partnership with private individuals has done a lot to integrate ICT into the school curriculum and providing the necessary ICT equipment to enable students and teachers move away from the traditional use of biro and note books and other manual method of teaching and learning to more advanced and faster means of acquiring knowledge. It is observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. Most of these studies were carried out in developed countries where the use of ICTs has come of age, and where there are resources and material to maintain them.

However, the use of ICTs by teachers in Nigeria is just beginning to gain popularity and researches in the area have just started emerging. Emphatically, the use of ICTs by teachers to teach the students is highly advantageous. This is because it enables them to demonstrate understanding of the opportunities and implications of the uses for learning and teaching in the curriculum context; plan, implement, and manage learning and teaching in open and flexible learning environment. Despite the efforts of government and other stakeholders to achieve complete implementation of ICT programs in secondary schools to enhance the academic achievements of students, it is sad to note that the efforts has not yielded the desired results as most secondary schools in Owerri North Local Government in Imo State do not have functional computer laboratories, obsolete and damaged ICT equipment as a result of lack of maintenance, and non-implementation of ICT programs to make teaching and learning more easier and interesting (Goktas, Yildirim & Yildirim, 2018). It is also observed that some studies have been conducted on uses of ICTs by teachers particularly on the issue of their professional development. Most of these studies were carried out in developed countries. Although, studies related to ICT have been carried out within the country yet the desired results has not been achieved particularly among public secondary schools. In the light of these therefore, more research is needed to showcase further development of ICTs use by secondary school teachers and students in Nigeria and teacher effectiveness. This is the gap the researchers tried to fill, to investigate the influence of information and communication technology knowledge on teacher's effectiveness and students' academic achievement in public secondary school in Owerri North LGA of Imo State.

Purpose of the Study

The main purpose of this study is on secondary school teacher's effectiveness and student's academic achievement in Owerri North L.G.A of Imo State. Specifically the study tried to;

1. Investigate the relevance of ICT knowledge on teachers' effectiveness in public secondary school in Owerri North LGA of Imo State.
2. Identify the various constrains to effective utilization of ICT by teachers and students in public secondary schools in Owerri North LGA.
3. Find out the extent to which teacher effective use of ICT influence academic achievement of secondary students in Owerri North LGA.

Research Questions

The following research questions guided the study.

1. What is the various relevance of ICT knowledge on teacher's effectiveness in public secondary schools in Owerri North L.G.A of Imo State?
2. What are the various constraints to effective utilization of ICT by teachers and students in public secondary schools in Owerri North L.G.A of Imo State?
3. To what extent does teacher's effective use of ICT influence academic achievement of secondary school students in Owerri North L.G.A of Imo State?

Methodology

The research design adopted for this study is a descriptive survey design because it involved the assessment of public opinion on the influence of ICT knowledge on Teacher's Effectiveness and secondary school academic achievement in Owerri North L.G.A of Imo State. The use of this design in this study is justified because it tries to investigate an event in a natural setting without the researcher trying to manipulate the dependent and independent variables. The population of the study comprised all students and teachers in Owerri North L .G .A, giving a total of seven thousand, three hundred and thirty three (7267). Six hundred and sixty six teachers (660) and six thousand, six hundred and sixty seven students (6607). The sample size for the study comprised three hundred and fifty (350) respondents, randomly drawn from the study population. However, the researcher decided to focus on the teachers and students of the senior secondary schools (SS1-3). The instrument for data collection was the researchers constructed questionnaire titled "ICT knowledge and Teachers Effectiveness and Academic Achievement Questionnaire" (IKTEAAAQ), with the four point Likert scale of Strongly Agreed (SA)= 4, Agreed (A)=3 Disagreed (DA) = 2, Strongly disagreed (SD)= 1; also to a Very Large Extent (VLE)=4, Large Extent (LE)=3, Small Extent (SE)=2 and Very Small Extent (VSE)=1.The instrument was face and content validated by two experts in information and communication technology, and an expert in Measurement and Evaluation, all from Alvan Ikoku Federal College of Education

Owerri. Reliability of the instrument was ascertained using a test- re-test method of an interval of two weeks. To do this, the questionnaire was administered to 10 teachers and 30 students from Owerri West L.G.A, who were not part of the real study but have the same characteristic. Thereafter, the two sets of scores generated were correlated using Pearson's Product Moment Correlation Statistics and reliability index of 0.86 was obtained. Data collected was analyzed using mean statistics. The decision mean for the analysis was 2.50. Hence, the acceptable mean was 2.50. This implies that every mean score which is exactly or above 2.50 agrees with the decision was accepted while any score below 2.50 disagrees with the decision was not accepted.

Results and Analysis

Research Question One: What is the relevance of ICT knowledge on teacher's effectiveness in public secondary schools in Owerri North L.G.A of Imo State?

Table 1: Mean ratings of the respondents on the relevance of ICT knowledge on teacher's effectiveness in public secondary schools in Owerri North L.G.A of Imo State.

S/N	ITEMS	N	SA	A	D	SD	X	Decision
1.	Teacher effectiveness contributes positively to students' Academic achievement	350	230	115	5	-	3.6	Agreed
2.	Teacher effective communication skills promote exchange thoughts, ideas, opinions and knowledge		230	110	7	3	3.6	Agreed
3.	Adequate knowledge of subject matter by the teacher m ng interesting and meaningful.		220	128	2	-	3.6	Agreed
4.	Teacher effectiveness promotes teacher-student relationshi		188	150	10	2	3.4	Agreed
5.	Teacher effectiveness helps in creating positive classroom environment.		240	100	9	1	3.6	Agreed
	Grand Mean						**3.6**	

Results on table 1 above revealed a grand mean of 3.6 which is greater than the decision mean of 2.50; this implies that the respondents agreed that ICT knowledge is relevant to teacher's effectiveness in public secondary school students in Owerri North LGA of Imo State.

Research Question Two: What are the various constraints to effective utilization of ICT by teachers and students in public secondary schools?

Table 2: Mean responses on the various constraints to effective utilization of ICT by teachers and students in public secondary schools in Owerri North L.G.A of Imo State.

S/N	ITEMS	No. of Resp.	SA 4	A 3	D 2	SD 1	X	Decision
1	Lack of appropriate administrative support.	350	230	100	15	5	3.5	Agreed
2	Damage and lack of maintenance of ICT equipment.		250	90	10	-	3.6	Agreed
3.	Inadequate provision of ICT equipment to accommodate every student.		245	103	2	-	3.6	Agreed
4.	Lack of access to internet facility and poor network reception on some areas.		250	93	7	-	3.6	Agreed
5.	Epileptic power supply and lack of alternative sources.		205	145	-	-	3.5	Agreed
	Grand Mean						**3.6**	

Results in table 2 above revealed a grand mean of 3.6 which is greater than the decision mean of 2.50.This implies that the respondents agreed that there are constraints to effective utilization o ICT by teachers and secondary school students in Owerri North LGA of Imo State.

Research Question Three: To what extent does teacher's effective use of ICT influence academic achievement of secondary school students in Owerri North LGA of Imo State?

Table 3: Mean responses on the extent teacher's effectiveness use of ICT influence academic achievement of secondary school students in Owerri North LGA of Imo State?

S/N	Items	No. of Resp.	V.L.E	L.E	S.E	V.S.E	X	Decision
1	Students are able to handle complex problems easily.	350	290	50	5	5	3.7	Large Extent
2	Ability to be creative.		215	133	1	1	3.6	Large Extent
3.	It will enable the students to access and utilize new knowledge.		275	70	3	2	3.7	Large Extent
4.	Encourages self-centered learning because they can learn at their own pace.		200	140	8	2	3.5	Large Extent
5.	It will enable students to develop critical thinking skills.		250	97	2	1	3.7	Large Extent
	Grand Mean						**3.6**	

Result on table 3 revealed a grand mean of 3.6 which is greater than the decision mean of 2.50. This implies that to a large extent, teacher's effective use of ICT influence academic achievement of secondary school students in Owerri North LGA of Imo State.

Discussion of the Findings

The findings of the study revealed that adequate knowledge of ICT improves teacher effectiveness in communication skills, classroom management and control, knowledge of subject matter, conducive classroom environment and good teacher –student relationship in public secondary schools in Owerri North LGA, Imo State. This finding is in agreement with Coursera Staff (2024) who described communication skills as the process of exchanging ideas, thoughts; opinions, knowledge and data. ICT knowledge on teacher's effectiveness on academic achievement is relevant such as ability to build new knowledge through access to information, enhancing teacher's creativity etc. This is in line with the findings of Brush, Glazewski and Hew (2020) that ICT is used as a tool for teachers to discover learning topics, solve problems, and provide solutions to the problems in the teaching and learning process.

The findings of the study also identified various constraints to effective utilization of ICT in secondary schools as: lack of appropriate administration supply for effective use of ICT materials, inadequate supply of ICT equipment to accommodate every student, damage and lack of maintenance of ICT equipment, epileptic power supply etc. The findings agrees with Yildirim (2019) who found out that school inspectors focus more on the quantity of course content and student test scores than on ICT usage, also in corroboration, is Lim (2018) who identified lack of appropriate administrative support for effective use of ICT equipment.

Lastly, the findings of this study showed that to a large extent teacher's effective use of ICT in secondary schools promotes academic achievement of students. This is in agreement with Koc (2020) who stated that the extent of teacher's effective use of ICT influence academic achievement by encouraging self-centered learning of the students and enhances their understanding of concepts and ideas.

Conclusion

The role of Information and Communication Technology (ICT)is found very important in the school system considering the 21st century demands. The use of ICT in education is to improve teaching and learning in public secondary schools and also improve the academic performance of students. As a matter of fact, this issue cannot be overemphasized. If the schools in the State would continue to ensure the quality of their work through ICT, continue to be "knowledge creating" institutions in which the knowledge of all the schools members and partners are recognized, if the teachers are to continue to be committed to making a difference in the learning lives of their students through skillful teaching combined with the use of ICT, then there will be transformation in the educational sector of teaching and learning.

Recommendations

Based on the findings, the following recommendations were drawn;

1. ICT professionals should be employed in the secondary schools in Owerri North Local government Area so that they will conduct computer training to teachers and staff of the schools.
2. Government and stakeholders in education should organize a computer units manned by experts in all secondary schools within Owerri North L.G.A. Also computer and other ICT equipment should be adequately provided in these schools to accommodate every student in the school and enhance the quality of education and information management of the schools.
3. In house training on the use of computer should be conducted for teaching staff of these schools.
4. A stand by generating set should be provided for these schools. This will help to simplify the problem of epileptic power supply.
5. Computer systems should be installed with relevant educational software that will help to simplify teaching and learning and make for effectiveness, this will help the student's master all that is needed in the use of ICT.

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