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Awareness and application of modern technologies for teaching among secondary school teachers in Okrika Local government area of Rivers State, Nigeria

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Abstract
Modern technology has asserted itself to have enormous relevance and benefits to global turn-around being experienced in all sectors of the economy. It, therefore, becomes alarming and raises concern if policymakers in the sector have not considered the need for the professional development of teachers in the area of awareness and application of modern technologies in teaching and learning. This study investigated the level of awareness and application of modern technologies in teaching and learning among public secondary school teachers in Okrika Local Government Area (LGA) of Rivers State. The analytic descriptive survey was applied and random sampling technique was used to determine the sample for the study. The study made use of three research questions and three corresponding hypotheses. A self-constructed questionnaire of twenty items on a four-point Likert scale titled Awareness and Application of Modern Technologies Questionnaire (AAMTQ) was used to elicit information from the teachers. The research questions were answered using mean and standard deviation, while the hypotheses were tested using Z-test statistics at 0.05 level of significance. Based on the results, conclusions and recommendations were made.

Keywords: awareness, application, modern technologies, teaching and learning.

1. Introduction

Modern technology in today's world plays a very important role in our lives and in all activities that we are involved in. It is viewed as a basis of growth for a nation's economy as the use of technology makes our work much easier and less time-consuming. Modern technology consists of the collection of techniques, skills, methods and processes used in the production of goods or services as well as in the accomplishment of organizational objectives. This is asserted by Ubabudu and Muraina (2016) who explain that Nigeria cannot be successful in achieving her national goals and objectives as well as to attain sustainable national development without efficiently adopting and utilizing the ideas, skills, values and benefits of modern technology.

The impact of modern technology can be felt in every possible field of life of which the education sector is inclusive. Modern technology is therefore an aspect of the curriculum, as well as a tool for teaching and learning, of which teachers must demonstrate their awareness and capacity for effective teaching and learning process. In other words, for effective and meaningful teaching and learning in the 21st century, the demonstration of teachers' awareness and application of modern technologies for instructional use plays a great role in the impartation of knowledge. Yuen, Law and Wong (2003) opined that modern technology can improve the quality of education through facilitating learning, real-time conversation, delayed time conversation during lessons, directed instruction, self-learning, problem-solving development, information seeking and analysis methods, and critical thinking for teachers and students, as well as the ability to communicate, collaborate and learn.

The role of the teacher is very essential in the effective implementation and accomplishment of the curriculum with the task of imparting knowledge. The teacher amongst other things must be abreast with the fundamental principles of teaching that will enable him/her to be efficient and productive in the discharge of his/her duties. Teachers need to be able to influence the three domains of learning (cognitive, affective and psychomotor) of their learners to encourage the effective process of teaching and learning. The use of modern technologies in education makes the process of teaching and learning at the secondary school level much easier for the teacher as it enables the teacher to effectively accomplish the goals of education. Therefore, teachers who are stocked-up with traditional methods and beliefs in teaching and learning need gradual re-orientation and one on one practical interaction with technologies in teaching and learning to understand its potentials.

This follows that the awareness and application of modern technology by teachers involves having knowledge and gaining access to technological equipment, proper use of internet connectivity and computers, inadequacies in the use of audiovisual materials and types of equipment including films, slides, transparencies, projectors, globes, information retrieval systems, and instructional television in technology education programs are the reasons that have greatly influenced the lack of proper training on technology education for the effective and professional development of secondary school teachers in Nigeria. The fact remains that, teachers cannot perform the miracle of using modern technologies if they have not seen them, aware of their significance or have the technology available for application.

According to the National policy on education (FRN,2014), secondary education is expected to provide students with, a diversified curriculum; development and projection of the Nigerian culture, etc; raise a generation who can think for themselves, respect the feelings of others, respect the

dignity of labour, and appreciate those values specified under the national aims as citizens; inspire students with the desire for achievement and self-improvement, both at school and later on in life and above all equip students to live effectively in our modern age of science and technology. Given that students at this level of education are expected to be abreast with modern technologies and teachers are the brain behind such, this study is aimed at determining the level of teachers' awareness, application and constraints in the use of modern technology among secondary school teachers in Okrika local government area of Rivers State.

Statement of the Problem

Teachers in all levels of education are pacesetters and the brain box behind educational policies and programmes in the education sector. Teachers at the secondary school level are bestowed with the essential role of preparing students into tertiary institutions and semi-skilled jobs. Given the responsibilities of the teacher, certain competencies are expected of which the awareness and application of modern technologies to teaching and learning is inclusive. Being that one of the objectives of secondary education is to equip students to live in a modern age of science and technology of which modern technologies, especially in the education sector, are elements of educational development. It is therefore alarming and worrisome to note that some teachers in secondary schools are not aware of modern technologies that are used for teaching and learning more less their application.

Teacher education is a form of education for incoming and already existing teachers that equips them with all the information and knowledge that is required in the teaching profession. It is viewed as a sacred duty that must never be toyed with if the teaching profession must fulfill its professional responsibility of cultivating and nurturing generations of highly responsible disciplined and useful Nigerians. Educational administrators are expected to provide teachers with the intellectual and professional background needed in the profession of teaching and this is expected to be available for new and existing teachers.

In view that modern technologies evolve daily so also do technologies in education especially in the areas of teaching and learning, as such it becomes expedient that teachers are constantly aware of these changes, their application and effective use in teaching and learning to effectively achieve educational goals and objectives at the secondary school level. This paper therefore, intends to investigate the level of awareness and application of modern technologies in teaching and learning among public secondary school teachers in Okrika local government area of Rivers state. The study shall also investigate the difference in the level of awareness and application of modern technologies between junior and senior public secondary school teachers.

Purpose of the Study

The purpose of the study is to investigate the extent of teachers' awareness and application of modern technologies in teaching and learning among public secondary school teachers in Okrika local government area of Rivers State. Specifically, the study sought to determine;

1. The level of teachers' awareness of modern technologies in teaching and learning.
2. The level of teachers' application of modern technologies in teaching and learning.
3. The constraints encountered by teachers in the awareness and application of modern technologies in teaching and learning.

Research Questions

The study was guided by the following research questions;

1. What is the level of awareness in the of modern technologies for teaching and learning among public secondary school teachers' in Okrika local government area of Rivers State?
2. What is the level of application in the use of modern technologies for teaching and learning among public secondary school teachers' in Okrika local government area of Rivers State?
3. What are the constraints encountered in the application of modern technologies in teaching and learning among public secondary school teachers' in Okrika local government area of Rivers State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference on the level of awareness in the use of modern technologies for teaching and learning between junior and senior public secondary school teachers in Okrika local government area of Rivers State.
2. There is no significant difference on the level of application in the use of modern technologies for teaching and learning between junior and senior public secondary school teachers in Okrika local government area of Rivers State.
3. There is no significant difference in the constraints encountered in the application of modern technologies for teaching and learning between junior and senior public secondary school teachers in Okrika local government area of Rivers State.

Theoretical Framework

The theoretical framework for this study is anchored on Technological Pedagogical Content Knowledge (TPCK) but now known as Technology, Pedagogy, and Content Knowledge (TPACK), propounded by Mishra and Koehler (2006) [8]. The TPACK framework describes the teacher as one with three bodies of knowledge in the form of:

1. Content knowledge (CK) where the teacher is expected to know the subject and lesson of which the teacher intends to teach the students and the ability to be able to impact on that level of learners.
2. Pedagogical Knowledge (PK) which is the knowledge obtained from teacher education where the teacher is expected to have a deep knowledge about the processes, practices and methods of teaching and learning in the form of educational purposes, values, aims, an understanding how students learn, classroom management skills, lesson planning, student assessment, nature of the target audience; and strategies for evaluating student understanding.
3. Technology Knowledge (TK) on the other hand is used to explain the teacher's fluency of modern technology, explaining that the teacher who wants to use technology in teaching and learning must need to have the required technical knowledge required for the application to productively at work and in their everyday lives.

TPACK theory explains that to achieve educational goals with the use of modern technology, teachers' having content knowledge (CK), pedagogical knowledge (PK) and Technological knowledge (TK) is not enough. But that teachers need to acquire technological content knowledge (TCK) and technological pedagogical knowledge (TPK) thereby acquiring Technological Pedagogy and Content Knowledge (TPACK). The use of TPACK enables teachers to understand the representation of techniques using technological knowledge in different constructive ways to teach: knowledge of what makes concepts difficult or easy with the aim of using technology to redress problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

TRACK therefore, explains that for teachers to be effective in the use of modern technologies for teaching and learning they have to have technical (ICT) knowledge in the application of content and pedagogy the classroom. It is believed that if the teacher has TRACK integrating technology in teaching and learning process will be easily achieved, and as such teachers need to understand the instructional practices of what they intend to teach from a content-driven, pedagogically-sound, and technologically-forward thinking knowledge

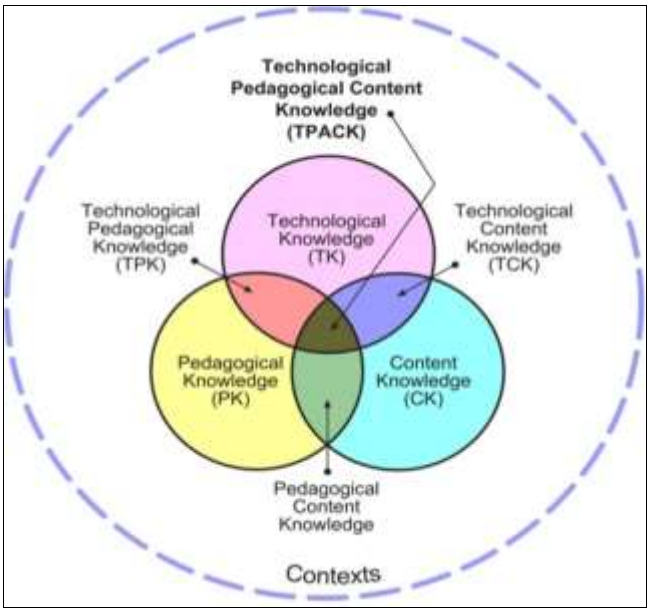

Fig 1: TPACK framework and its knowledge components.

TRACK framework: Mishra and Koehler (2006) [8].

Figure 1 explains that public senior secondary school teachers in Okrika local government area need to be knowledgeable in content, pedagogy and technology as it relates to the needs of education sector. But to be able to achieve results with modern educational technology in teaching and learning they need technological pedagogy and content knowledge (TPACK).

Conceptual Clarification

Modern Technologies in Teaching and Learning

Technology has been reckoned to mean different things to different people depending on what the usage or the point of discussion is about. It is referred to as equipment, products, tools, instruments, gadgets, products and processes. In simple terms, technology refers to all form of advancements in the ways, methods and tools we use to solve different problems or to achieve a goal or task. In the classroom, technology can encompass all kinds of tools from low-tech pencil, paper, and chalkboard, to the use of presentation software, or high-tech tablets, online collaboration and conferencing tools, and more. For this study, technology is viewed as a process and a product that is used in the classroom with the sole aim of achieving educational goals whilst in the process of teaching and learning, and it is sometimes referred to as technology in education.

This is in line with Mangal and Mangal (2010) [7], who defined technology in education as the use of technology in the advancement of education through using different types of equipment, materials and machines to enhance effective education. Technology is a powerful tool that can support and transform education in many ways, from making it easier for teachers to create instructional materials for teaching to enabling new ways for people to learn, work together and make the work easier. With the worldwide reach of the Internet and the ubiquity of smart devices that can connect to it. The use of technology in education has changed the methods used in accomplishing goals in the education sector. Earlier, blackboard and books were used to teach but now it's completely changed to digital boards and smartbooks which can be accessed anytime and anywhere. Learning new things is much faster and easier for teachers and students as more knowledge can be achieved personally by means of the internet.

The National policy on education recognizes the important role of technology in the advancement of knowledge in the education sector and most especially at the secondary school level. This is depicted in the National Policy on Education (2004) [6]. where it states that government shall provide all the necessary infrastructure and training at the secondary school level for the integration of information and communication technology, given its enormous achievements globally in the advancement of knowledge and skills. This is supported by the World Bank (2009) opines that secondary education is now being recognized as the cornerstone of educational systems, given its peculiarities of being terminal and preparatory, compulsory and post-compulsory as well as the only link between primary and tertiary education, and the labour market.

The use of modern technology in education cannot be overemphasized as it creates a powerful learning environment and can transform learning and teaching processes, allowing students to deal with knowledge in an active, self-directed and constructive way. It is important to note that modern technologies in education are not just tools that have been added to or used as a replacement of the already existing teaching and learning methods rather they are tools that are provided to support new ways of teaching and learning. Knezek and Christensen (2002) in a study on the impact of technology integration education on the attitudes of teachers and students from different quantitative studies conducted between 1995-2001, discovered a high positive impact and achievement of technology on teacher-learner perception and the acquisition of various skills (skills for communication, problem solving and lifelong learning) which enhances education.

Teachers' Awareness of Modern Technologies for Teaching and Learning

The awareness about any policy or programme of an individual form the basics and backbone upon which its utilization and productivity can be effective. This means that when an individual is aware of the guiding principles about a thing, then and only then can the person cultivate the right attitude which will result in improved productivity of that policy or program. Teachers are the key change agents of educational development in any country which extends to all other aspects of growth and advances needed in teaching-learning processes and scientific developments. Therefore, the awareness of teachers to modern technology for teaching and learning, problem-solving skills, capacity building and other germane issues relating to education cannot be undervalued. Teachers at all levels need to understand the role of modern technology in teaching and learning.

Obidike, Anyikwa and Enemou (2011) [9]. in a study on teachers' awareness of the existence and the use of technology to promote children's literacy instruction with a focus on teachers of nursery and primary schools on the existence of the technological resources that could be used to support children's literacy instruction, as well as the use of such technological resources for enriching children's literacy instruction. Given a sample of five hundred teachers, it was discovered among other things that the teachers can identify the technological tools that could be used to enhance literacy instruction in children but are not aware of how such resources could be used.

Similarly, Buhari and Nwoji (2015) [5]. investigated the level of ICT awareness among secondary school teachers in Sokoto State with a sample of four hundred secondary school teachers. The result showed that the level of teachers' awareness of ICT facilities is rapidly growing with majority of secondary schools having ICT facilities. But the level of ICT training to teachers is fair because the difference between trained teachers and untrained teachers is negligible. It was also observed that very few teachers use ICT facilities in teaching and learning with reasons such as lack of proper training on how to use the available ICT facilities and lack of power supply.

In another study on teacher awareness by Adebowale and Dare (2012) titled teachers' awareness of Nigeria's educational policy on ICT and the use of ICT in Oyo State Secondary Schools. The study was aimed at investigating the level of awareness of primary and secondary school teachers invited for a capacity building workshop on ICT of Nigeria's educational policy on ICT as well as its possible influence on the use of ICT for classroom teaching and learning, consisting of two hundred teachers. Results showed that only a small percentage of the respondents possess a high level of awareness of the country's educational policy on ICT. It was also discovered that 35.1 percent of the respondents were either completely ignorant of the policy or possess poor levels of its awareness and that their previous training also had no significant influence on their awareness of the country's educational policy on ICT.

All the studies have identified the fact that a lot of teachers are not aware of the national policy on the use of modern technologies in education; as such they are not also aware of the modern technologies for teaching and learning. The national policy on education (FRN, 2014) on teacher education clearly states that teachers in educational institutions shall be equipped with all they need to perform their duties with the inclusion of information technology in all their training and development programmes. The question then is has the government kept to its promise for the teachers in the area of teacher education on the awareness of modern technologies in teaching and learning.

Teachers' Application of Modern Technologies for Teaching and Learning

The awareness of modern technologies remains the prerequisite for teachers in their ability to apply modern technologies during teaching and learning activities in class and be able to achieve educational goals. The application of modern technologies for educational purposes as explained in the theory of TPACK requires peculiar demands of the teacher for efficient use of modern technologies. Eva (2005) complained that modern technologies have been infused into schools without policymakers ensuring a fundamental change in the way learning and teaching takes place, the facilities may be available but they are not used for the expected educational reform we hope for. The application of technology in teaching and learning requires teachers to be knowledgeable and competent in ICT to be able to integrate it into the curriculum, aligned with student learning goals, as well as engaging learners in a quest for academic development.

The emphasis on teachers applying modern technology is basically to use technology to effectively create new opportunities for students to learn about concepts in a more exciting way. In an empirical study of the application of technology in teaching Geography in Nigerian secondary schools by Sofowora and Egbedokun (2010) [10], it was discovered that about 55% of Geography teachers had access to the computer but did not have the pre-requisite ICT skills in its application. It was also discovered that out of the modern technologies available, the most commonly used were; instructional television, radio and video because the teachers had no knowledge of the usage of the others. It was also alarming that about 54% of Geography teachers do not know the instructional value of CDROM neither did they know about interactive web packages freely available for teaching Geography with about 84% of the teachers rarely using the newsgroups, and 42% rarely making use of multimedia presentation in teaching.

Ajayi and Ekundayo (2009) [4]. Conducted a similar research on the application of information and communication technology in Nigerian secondary schools. The study was aimed at investigating the level of availability of ICT facilities in schools, the capacity for using ICT facilities for teaching-learning, the perceived benefits of using ICT and the problems facing the use of ICT in secondary schools. With a sample size of 320 teachers and 40 principals randomly selected it was revealed that ICT facilities were lacking in schools and teachers and students had only very little knowledge on the use of ICT. The study also revealed that the perceived benefits of using ICT in schools by both teachers and students include; making teaching-learning-interesting; helping the distance learning programme; helping teachers to be up-to-date; enhancing the quality of work by both the teachers and the students.

The applications of modern technology in teaching and learning include the following; content knowledge and ability acquired last long, students are involved in the process, teachers and students are exposed to more knowledge concerning the lesson, gives teachers and

students access to up to date information, enables gives creativity, etc. From all the studies discussed it can be therefore be said that both teachers and students in some secondary schools in the country are deprived of these amazing opportunities.

Challenges in the Application of Modern Technologies for Teaching and Learning

Inspite of the enormous befits of modern technology to teaching and learning, some challenges have been discovered in its effective application in the educational sector most especially in secondary education. The challenges of using modern technology in teaching and learning differ from educational level as well as the subject area, even in the topic that is to be taught and learnt.

Aduwa-Ogiegbaen and Iyamu (2005) [3]. in a research on the use of Technology in secondary schools in Nigeria: Problems and prospects, aimed at examining its major constraints in secondary education in Nigeria, discovered the constrains to include; high cost of computer hardware and software; weak infrastructure; lack of human skills and knowledge, lack of relevant software appropriate, high cost of subscribing to the internet and poor power supply. In a similar study by Ajayi and Ekundayo (2009) [4]. the challenges in the application of modern technologies revealed: irregular power supply: inadequate computer literate teachers; high cost of purchasing computers in schools; inadequate facilities to support the full application of the ICT and lack of fund.

Further studies by Adomi, Esharenana and Kpangban (2010) [2]. on the low rate of ICT adoption and application in Nigerian secondary schools perceived by 176 people in two states of Nigeria: 9 schools in Edo State with 84 respondents and 6 schools in Delta State with 92 respondents comprising of 176 teachers (97 males and 77 females). The study identified limited and poor information infrastructure as the highest constrain with other factors such as inadequate infrastructure resulting from underfunding, electricity failure and skilled manpower. For Sofowora and Egbedokun (2010) [10], on the application of technology in teaching Geography in Nigerian secondary schools by it was discovered that modern technologies were available for teachers in the teaching of geography but the challenges in its application were the lack of skilled teachers and the cost of the utilization of facilities. Studies also by Badau and Sakiyo (2013), with a view of assessing the competence of ICT of rural and urban secondary school ICT teachers for the implementation of ICT curriculum in North Eastern Nigeria, revealed that the competence of ICT teachers on policy, curriculum, pedagogy, technology, administration and professional development was very low. Challenges encountered by the ICT teachers included; lack of hardware, software, underfunding, lack of electricity and insufficient information and experience from teachers in ICT applications. On more factors, Maisamari, Adikwu, Ogwuche and Ikwoche (2018) in their study on the assessment of secondary school teachers use of information and communication technology with the focus on the factors hindering teachers readiness and confidence in using ICT tools discovered that, lack of expertise, knowledge of necessary computer software that facilitates easy manipulation of the computer, lack of sufficient knowledge of e-learning and the lack of how to evaluate the use of ICT in teaching and learning.

It can, therefore, be asserted that Nigeria educational system still has a long way to go as educational policymakers are not rising to their responsibility of ensuring that the use of modern technology is effectively integrated into education. So that Nigeria teachers and students in this generation and those to come can acquire the benefits of modern technology.

Methodology

The analytic descriptive survey design was used to determine the level of awareness and application of modern technologies in teaching and learning among public secondary school teachers in Okrika local government area. The population of the study comprised of 231 teachers in the 6 junior secondary schools (RSUBEB, 2014) and 324 teachers in the 6 senior secondary schools (RSSSSB, 2017) given a total population of 555 teachers in Okrika local government area of Rivers State. To have a fair representative sample, 5 teachers from each educational level (JSS 1-3) 15 teachers and (SSS 1-3) 15 teachers were selected which gave a total 180 teachers, comprising of 90 teachers from junior secondary as well as 90 teachers from senior secondary and about 32% of the population. The selection of teachers at the different schools was done through simple random sampling technique.

The instrument used for data collection was a self-structured questionnaire titled “Awareness and Application of Modern Technologies Questionnaire” (AAMTQ), which consisted of twenty items on a four-point Likert scale of Very high Level (VHL) 4 points, High Level (HL) 3 points, Low level (LL) 2 points and Very low Level (VLL) 1 point. To establish face and content validity, three research experts in the department of educational management and measurement and evaluation, all in the faculty of education, Ignatius Ajuru University of Education, validated the instrument. Therefore, the research instrument went through an editorial process, which led to observations and corrections were made where necessary.

For data analyses mean and standard deviation were used to answer the research questions while z-test statistics was used to test the null hypotheses at 0.05 level of significance. Remarks were given based on Mean ratings of 3.50-4.00 VHL, 2.50-3.49 HL, 1.50-2.49 LL and 1-1.49 VLL. For the hypotheses, where the calculated Z-value was greater than the table Z-value the hypotheses was rejected, on the other hand where the calculated Z-value is lower than the table Z-value the hypotheses were accepted.

Results

Results of Research Questions

Table 1: Awareness of Modern Technologies by Teachers' in Public Secondary Schools in Okrika Local Government Area.

S/no.	Items	N	$\bar{X}$	SD	Remark
1.	Computer/laptops	180	1.92	1.10	LL
2.	Digital audio recorder	180	1.77	1.03	LL
3.	Electronic whiteboard	180	2.11	1.07	LL
4.	Projectors	180	1.94	1.08	LL
5.	Internet and online media	180	1.99	1.06	LL
6.	Word processing	180	2.07	1.05	LL
7.	Video conferencing	180	1.82	1.04	LL
8.	Classroom management software	180	1.74	1.02	LL
	Grand mean		1.92	1.10	

$\bar{X}$ = 1.92 (1.50-2.29) LL = LOW LEVEL

The data in Table 1 shows the level of awareness of teachers' to modern technologies for teaching and learning in public senior secondary schools in Rivers State. The result shows that computers/laptops (Mean=1.92, SD=1.10), digital audio recorder (Mean=1.77, SD=1.03), electric whiteboard (Mean=2.11, SD=1.07),, projectors (Mean=1.94, SD=1.08),, internet and online media (Mean=1.99, SD=1.06), word processing (Mean=2.07, SD=1.05),, video conferencing (Mean=1.82, SD=1.04), and classroom management software (Mean=1.74, SD=1.02), all indicate low level of teachers' awareness of modern technologies for teaching and learning. The grand mean of 1.92 further indicates that teachers in public secondary schools in Okrika local government area of Rivers State have Low Level of awareness of modern technologies for teaching and learning. The average standard deviation value of 1.10 shows that the individual scores of teachers' cluster around the mean value.

Table 2: Application of Modern Technologies by Teachers' in Public Secondary Schools in Okrika Local Government Area.

S/no.	Items	N	$\bar{X}$	SD	Remark
1.	Computer/laptops	180	1.74	0.96	LL
2.	Digital audio recorder	180	1.57	0.92	LL
3.	Electronic whiteboard	180	1.68	0.96	LL
4.	Projectors	180	1.71	0.97	LL
5.	Internet and online media	180	1.69	0.99	LL
6.	Word processing	180	1.75	0.90	LL
7.	Video conferencing	180	1.48	0.89	VLL
8.	Classroom management software	180	1.51	0.96	LL
	Grand mean		1.64	0.94	

$\bar{X}$ = 1.64 (1.50-2.29) LL – LOW LEVEL

The data presented in Table 2 shows the level of application of modern technologies by the teacher for teaching and learning in public senior secondary schools in Rivers State. The result shows computers/laptops (Mean=1.74, SD=0.96),, digital audio recorder (Mean=1.57, SD=0.92), electric whiteboard (Mean=1.68, SD=0.96),, projectors (Mean=1.71, SD=0.97),, internet and online media (Mean=1.69, SD=0.99),, word processing (Mean=1.75, SD=0.90),, and classroom management software (Mean=1.51, SD=0.96), all indicate low level while video conferencing (Mean=1.48, SD=0.89), indicated very low level of teachers' application of modern technologies for teaching and learning. The grand mean of 1.64 further indicates that teachers in public secondary schools in Okrika local government area of Rivers State show Low Level of the application of modern technologies for teaching and learning. The average standard deviation value of 0.94 shows that the difference in the individual scores of teachers is very small.

Table 3: Constrains to the Application of Modern Technologies by Teachers' in Public Secondary Schools in Okrika Local Government Area.

S/no.	Items	N	$\bar{X}$	SD	Remark
1.	Wrong perception	180	2.01	1.04	LL
2.	Inadequate knowledge	180	2.40	1.03	LL
3.	Inadequate modern technologies	180	2.88	1.26	HL
4.	Power supply	180	2.91	1.34	HL

$\bar{X}$ = 2.55 (1.50-2.29) LL – LOW LEVEL

The data in Table 3 shows the level of constraints the listed items have on the application of modern technologies by teachers' for teaching and learning in public senior secondary schools in Okrika local government area of Rivers State. The result shows that wrong perception (Mean=2.01, SD=1.04) and inadequate knowledge (Mean=2.40, SD=1.03), indicate low level of constraints while inadequate modern technologies (Mean=2.88, SD=1.26), and power supply (Mean=2.91, SD=1.34), indicate high level of constraints to teachers' application of modern technologies for teaching and learning. The grand mean of 2.55 further indicates that the items have High Level of constraints on teachers' application of modern technologies in teaching and learning in public secondary schools in Okrika local government area of Rivers State. The average standard deviation value of 1.68 shows that the difference in the individual scores of teachers is very small.

Results of Hypotheses

Table 4: z-test Comparison of the difference in the Awareness of Modern Technologies between Senior and Junior Secondary School Teachers' in Public Secondary Schools in Okrika Local Government Area.

Class	N	$\bar{X}$	SD	df	z-cal.	z-crit.	Decision
Senior	90	2.10	1.13	178	0.99	1.96	Not rejected
Junior	90	1.77	0.94				

The result of table 4 data analysis shows z-calculated value of 0.99 at 0.05 level of significance with 178 degrees of freedom and a critical value of 1.96. Since the calculated value of 0.99 is greater than the critical value of 1.96, the

null hypothesis that there is no significant difference on the level of awareness in the use of modern technologies for teaching and learning between senior and junior secondary school teachers in Okrika local government area of Rivers State is rejected. The results, therefore, show that there is a no significant difference in the awareness of modern technologies between senior and junior secondary school teachers.

Table 5: z-test Comparison of the difference in the Application of Modern Technologies between Senior and Junior Secondary School Teachers' in Public Secondary Schools in Okrika Local Government Area.

Class	N	$\bar{X}$	SD	df	Z-cal.	Z-crit.	Decision
Senior	90	1.54	0.90	178	1.02	1.96	Not Rejected
Junior	90	1.73	0.97				

The result of Table 5 data analysis shows the Z-calculated value of 1.02 at 0.05 level of significance with 178 degrees of freedom and a critical value of 1.96. Since the calculated value of 1.02 is less than the critical value of 1.96, the null hypothesis that there is no significant difference on the level of awareness in the use of modern technologies for teaching and learning between senior and junior secondary school teachers in Okrika local government area of Rivers State is not rejected. The results, therefore, show that a no significant difference existsin the application of modern technologies for teaching and learning between senior and junior secondary school teachers.

Table 6: z-test Comparison of the difference in the Constraints in the Application of Modern Technologies between Senior and Junior Secondary School Teachers' in Public Secondary Schools in Okrika Local Government Area.

Class	N	$\bar{X}$	SD	df	z-cal.	z-crit.	Decision
Senior	90	2.57	1.20	178	1.24	1.96	Not Rejected
Junior	90	2.52	1.35				

The result of table 6 data analysis shows the z-calculated value of 1.24 at 0.05 level of significance degree of freedom of 178 and a critical value of 1.96. Since the calculated value of 1.24 is less than the critical value of 1.96, the null hypothesis that there is no significant difference in the constraints encountered in the use of modern technologies for teaching and learning between senior and junior secondary school teachers in Okrika local government area of Rivers State is not rejected. The results therefore show that a no significant difference exists in the constraints in the application of modern technologies for teaching and learning between senior and junior secondary school teachers.

Discussion of the Findings

The results of the study show that there is a low level of awareness about modern technologies for teaching and learning among teachers' in public secondary schools in Okrika local government area of Rivers State. This is in line with studies by Buhari and Nwoji (2005) [5]. and Obidike, Anyikwa and Enenou (2011) who are different studies identified teachers lack awareness of modern technologies in the education sector. The result also shows that there is a low level of the application of modern technologies for teaching and learning among public secondary school teachers in Okrika local government area of Rivers State. This also agrees with studies by Sofowora and Egbedokun (2010) [10]. and Ajayi and Ekundayo (2009) [4]. on the application of modern technologies for teaching and learning. On the constraints encountered in the application of modern technologies for teaching and learning the teachers indicated a low level of their perception as a constraint but indicated inadequate knowledge, inadequate modern technologies and power supply as a high level of constraints.

Conclusion

It is alarming that despite the enormous impact of modern technology experienced in the educational sector globally the Nigerian educational stack holders have not taken the bull by the horn to effectively integrate modern technologies for teaching and learning into our educational sector especially at the secondary school level. It is even heartbreak to hear that teachers in Okrika local government area of Rivers state are not aware of modern technology for teaching and learning. All stakeholders should rise to their responsibility and save the country's educational section from its collapse.

Recommendations

The study therefore recommends the following;

1. Further research should be conducted on secondary school teachers in other local government areas of Rivers State.
2. The state ministry of education in conjunction with the Universal Basic Education Board and the Senior Secondary School Board conducts a teacher education programme on the awareness of modern technologies for teaching and learning.
3. Further professional training with TRACK in mind should be done so that teacher will be taught more on the application of modern technologies in their different teaching area.
4. More focus should be placed on secondary education in the country as some parents are not able to afford tertiary education as such the specified goals of secondary education according to the national policy of education in the country should be efficiently accomplished.

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