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Challenges in Utilizing Information and Communication Technology for Teaching Basic Science and Technology in Secondary Schools in Rivers State

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Abstract
This study examined the challenges in utilizing information and communication technology in teaching Basic Science and Technology in Secondary Schools in Rivers State. The study adopted a descriptive survey design. The population of the study comprises 2122 students and 35 Basic Science and Technology teachers. A sample of 794 respondents (759 students and 35 Basic Science and Technology teachers) were sampled for the study. Four research questions were answered while four hypotheses were tested at 0.05 level of significance. The instrument used for data collection was a structured questionnaire which was validated by three experts in the field of study. A reliability coefficient of 0.85 was obtained through Pearson Product Moment Correlation (PPMC). The data collected was analyzed using mean and standard deviation, while the z-test for testing hypotheses. It was found that inadequate provision of ICT facilities, poor funding of schools, and inadequate supply of electricity were some of the challenges in the use of ICT in schools in Rivers State. Based on the findings, it was recommended among others that sufficient electric power be supplied to schools in the state, teachers should be motivated to use modern technology in the office as well as in the classroom through frequent workshops, conferences and seminars.

Keywords: Challenges, Information and Communication Technology, Teaching, Basic Science and Technology, secondary schools.

Introduction

The quest for knowledge is as old as man. Man has for ages been seeking knowledge on how to do things better and in an easier way. This has led to so many technological changes. In the 20th century, technology developed rapidly. Communication technology, transportation technology, broad teaching and implementation of scientific methods and increased research spending, all contributed to the advancement of modern science and technology. Radio, radar and early sound recording were key technologies, which paved the way for the telephone, fax machine and magnetic storage of data. Improvement in energy and engine technology was huge. Electronic computing technology was also on the increase. Even though we have just entered into 21st century, technology is being developed even more rapidly marked progress in almost all fields of science and technology has led to massive improvement in the technology we currently possess. The rate of development in computers is only one example of which the speed of progress continues forward. There has been a change in the scope and reach of information infrastructures that were the hallmark of the 1990s and have continued until the present. With so many changes in technology, the world has gone or become one global village. Information can be accessed from any part of the work at any time; anywhere provided the facilities are available.

These changes have manifested themselves through the extraordinary expansion of the internet and the worldwide web as well as the rapid development of wireless networks, giving rise to the networking revolution. No wonder developed societies have taken advantage of these changes with astonishing rapidity, gaining broad access to modern digital networks.

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The arrival of information and communication technologies has broadened the horizon of education as a result of increases in information, knowledge on various fields is readily available in split seconds. The school is continually playing catch-up as new technologies in the information process are emerging by the day. Nigeria is not left out and has included the compulsory study of some of such technologies to grapple with the ever-expanding information base in knowledge. As a result in almost all tiers in its educational system, computer studies have been made compulsory even at the primary level of education. Technologies hold an array of opportunities for teachers committed to achieving productive outcomes of learning. These are practices in motion that demonstrate how technologies can introduce more active learning even into every large class. There is a great deal of studies about how ICT is being used in developed countries, but there is not much information on how ICT is being incorporated into schools in developing countries. However, teachers are required to decide how to make proper educational use of ICT as well as in other subjects. It is important teachers and the government see the need for skills acquisition to effectively use the technology created by multimedia in the teaching process.

The fast pace of change in ICT creates significant challenges to the education sector schools and teachers are forever playing a technological catch-up as digital innovations emerge that require upgrading schools' technological infrastructure, and software packages and developing training programmes for teachers and other professionals to upgrade their knowledge as well. The volume of information in this 21st century is so high that no single individual can be in the position to contain it as it is today. The explosion in information has without a deliberate effort caused a corresponding increase in the knowledge and quantum of information teachers and students have to cope with and information technologies are uniquely capable of providing ways to meet this demand. Online training via the Internet ranges from accessing self-study courses to completing electronic classrooms. Computer-based training programmes provide flexibility in skills acquisition and are more affordable and relevant than most traditional courses. Some of these recent emerging technologies include Web 2.0, which makes the creation and sharing of multimedia content simple.

ICT has led to a fast-paced world in almost all spheres of human Endeavour. The rate at which the world is moving with information and communication technology (ICT) in this 21st century has left no choice to the educational sector, especially in the area of teaching and learning than to dance to the tune piped by recent technological trends (Augustine and Akpan 2014). These technologies have exposed teachers to various, means and methods of developing and delivering instruction to suit the diverse needs and learning styles of learners even though many employ these technologies mainly for social instead of academic purposes.

Inconsistency in Electricity Supply

In Nigeria, the biggest challenge to the growth and development of most industries is poor electricity supply. This is a huge setback to the progress of Nigeria, as it is difficult to boast of one full day without electricity interruption not to talk of a week or one month. Meanwhile, most countries of the world are beginning to celebrate 100 years and still counting no electricity interruption. Also, neighbouring countries Nigeria supply electricity manages to have an improved electricity supply than Nigeria (Azuh & Meledy, 2014). This problem is caused by the greed of some rich and influential citizens, who manipulate and lobby for non-electricity generators to frustrate citizens for business and home use on one hand; and the corruption and poor management of the electricity distribution company on the other hand. The government has been so reluctant to address this issue for a long time, despite the plight of citizens on the high cost of petrol and diesel to power their private generating plants in the midst of rising inflation. It is also funny and saddening that Nigeria is both a producer and export of these costly petroleum products. The government has in the past few years privatized the electricity supply in Nigeria, with the aim of solving this problem but it is obviously not helping the situation. The is a big challenge to information and communication technology deployment in Nigerian schools and indeed all industries require electricity in order to operate ICT and electronic gadgets (Azuh & Melody, 2014).

Some rich schools manage to provide electricity supply for their administrative sections, while other sections of the school go without electricity supply. It is so bad that classrooms and academic offices are expected to run under very hot weather, without an electric supply to power air conditioners. Fans, projectors, and other basic learning gadgets. Since privatization did not solve this problem, government partnership with private electricity distribution companies might be the only option life to improve electricity supply in Nigeria and aid ICT deployment in Nigerian schools.

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Akaninwor (2010) viewed that the ceaseless problem of poor electrical power supply in Nigeria has precipitated the relocation of some manufacturing organizations from the nation to neighboring countries. The plan by the federal government to improve the electrical power supply system by building additional power stations through public/private partnerships is yet to yield the desired result in spite of the huge amount (over $15 Billion) spent between 2000 and 2007 by ex-President Olusegun Obasanjo in that sector. Again, Business Times (year) reports that Chief Olusegun Obasanjo gave a presidential mandate in 2001 directing power supply as from January 1, 2002. This gave hope to every sector of the economy across the country and the general public. It is quite unfortunate that in spite of the huge amount sunk in this project, Rivers State is yet to have an improved electric power supply.

High Cost of Internet Data and Electronic Services

One of the problems of ICT application in Nigerian schools is the high cost of internet data and electronic services, which is basically the factor of ICT usage and value (Tongia, 2004). The internet as we know it today was created in the rest of the United States of America and introduced to the rest of the world America still has a stronghold of control, as most developing countries pay huge amounts of dollars to the US government for the connection of few megabits per annum (Tongia, 2004). This apparently affects the application and full utilization of information and communication technologies in the growing countries of which Nigeria is one. In Nigeria, the high cost of internet data and fast tariff set by internet providers mostly international companies doing business in the country with the main interest of making profits is among the problem of ICT usage. Although the government is supposed to regulate the internet distribution cost and tariff speed of these internet providers, most often the agencies in charge of such regulations are more interested in tax and the welfare of their organization that they overlook the value of services the companies they regulate offer to the people delivery teaching style instead of investment in modern technology, as well as the shortage of teachers who are qualified to use the technology confidently. Where training is ineffective, teachers may not be able access to ICT resources.

Lack of Interest

Several factors have culminated to adversely affect teachers in Rivers State which include the societal image, the neglect by the government, and high attrition rate in teaching, and a low morale among others. The Nigerian society is contributing immensely to this malady. In another dimension, the government must share in the blame. Primary and secondary school teachers suffer one hardship or the other as a result of government neglect. In Rivers State, secondary school teachers receive salaries last among the other civil servants. The teachers' working environment, the furniture and total well-being attest to the fact that they are abandoned or forgotten. Teachers who take-home pay cannot take them home. The salary is so meagre, which tends to bring frustration in dedicated service. If school teachers go to the same market as their contemporaries in the private sector, oil and gas industries and are expected to give quality education to their own children and acquire the things that make life worth living such as three square meals, good shelter and mobility, which workers in other sectors can afford easily, the meagre salary cannot accomplish these. This situation explains why the school system is constantly losing its teachers to other sectors for greater pasture. All these accounts for high attribution or the wearing away in teaching and the teacher's negative self-image. As a result, school teachers themselves do not even want their children to become teachers. Even the students undergoing teacher training programmes in our universities and colleges of education are not psychologically willing to teach after their training.

Inadequate Funding of Schools

The government is the primary source of financing education in Nigeria. Government expenditures in secondary education are presented in the form of budgets. The educational budget is an important aspect of school operation because it exerts control in financial discipline. The budget represents revenue from the state for education. All tiers of government annually make budgetary allocations to education. However, Olaopa (2014) succinctly itemized "inadequate funds allocated to the ICT projects, the difficulty associated with streamlining various aspect of e-government project already existing or being implemented prior to the creation of the ministry of communication technology, the disparity between urban and rural dwellers or those with low literacy levels in accessing the internet potential to erode the privacy of the citizenry, perceived lack of value for money when the huge cost of application of ICT projects compared to the actual value to the people, false sense of transparent as the challenges to the adoption and delivery of ICT.

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The government's inability to provide adequate funds for the purchase and installation of ICT facilities formed a major challenge in the implementation of ICT in teaching Basic Technology. Ayo and Ekong (2008) stress the absence of skilled workers to handle various ICT services. They also noted that the lack of government regulatory policy is a major issue that needs to be addressed if ICT is to be a reality in government secondary schools. To them, the effective and successful implementation of ICT requires training and retraining of experts to coordinate and operate the ICT-related infrastructure, because where there are no competent personnel to handle its infrastructures, it will be useless to procure the infrastructure.

Inadequate Provision of ICT Facilities

Information and Communication Technology is the coordination of teaching and learning towards the realization of educational objectives in our schools. Computers are configured in various ways to suit the user's purposes. ICT consists of the hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information. ICT for teaching and learning falls into these major categories as follows; the computer, internet, E-mail, CD-Roms, Video conferencing, PowerPoint, Desktop Publishing, Database, teleconferencing etc. These can be used for constructing knowledge and problem-solving using process skills, aiding the explanation of concepts, and communicating ideas. The fact borders on whether the teachers and students can have access to these facilities within and outside the school's environment and take advantage of it while teaching and learning Basic Technology. One thing is to acquire the ICT facilities, the other is to have access to it anytime, anywhere when the need arises especially inside the classroom, laboratory, typewriting workshop, virtual library and even in the hostel rooms. However, it is worth noting that developing countries such as Nigeria are still in their infancy state in the use of processing, transmission and presenting of information. ICT for teaching and learning falls into these major categories as follows: The computer, internet, E-mail, CD-Roms, Video conferencing, PowerPoint, Desktop Publishing, Database, teleconferencing etc.

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Different technologies are typically used in combination rather than as a sole delivery mechanism. For instance, radio broadcasts and computer internet technologies can be used to facilitate the sharing of information and provide educational opportunities, especially in rural communities. However, print, recorded, audio and video broadcast, radio and television and audio conferencing can be accessed 24 hours a day. The virtual library can also be accessed anytime without carrying a bulky textbook. Facilitators, mentors, students etc can be reached through e-mail and learning material can be exchanged. This is absolutely impossible when the students and teachers cannot have access to ICT facilities. Computers with internet connectivity should be made available by school authorities not only in the classroom but in the staff room and rooms in the student's hostel. This, she said, will enable them to have access to ICT facilities at any time of the day. Also, Nigerian schools are facing huge challenges in the adoption of information and communication technology like other renowned school of the world. This is a result of various factors which include but are not limited to loss of internet data and electronic services, fear of change, computer illiteracy fear of being made redundant, lack of facilities, internet and electronic security, inconsistency in electricity supply and the need for continuous training of staff.

High Cost of Internet Data and Electronic Services

One of the problems of ICT application in Nigerian schools is the high cost of internet data and electronic services, which is basically the factor of ICT usage and value (Tongia, 2004). The internet as we know it today was created in the rest of the United States of America and introduced to the rest of the world America still has a stronghold of control, as most developing countries pay huge amounts of dollars to the US government for the connecting of few megabits per annum (Tongia, 2004). This apparently affects the application and full utilization of information and communicating technologies in the growing countries of which Nigeria, the high cost of internet data and fast tariff set by internet providers mostly international companies doing business in the country with the main interest of making profits is among the problem of ICT usage. Although the government is supposed to regulate the internet distribution cost and tariff speed of these internet providers, most often the

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agencies in charge of such regulations are more interested in tax and the welfare of their organization that they overlook the value of services the companies they regulate offer to the people.

This is seriously affecting the deployment of ICT in Nigerian schools, as most schools in Nigeria manage their own funds, especially private schools. Hence, they cannot afford to make ICT available to the whole schools which include staff and students, unless they have sponsors or government funding to embark on such projects. The government should subsidize internet data costs and set a minimum tariff speed for internet providers in order to enable Nigerian schools to embrace ICT.

Lack of Computer Knowledge

Computer illiteracy is another problem of ICT in Nigerian schools. This is due to the fact that an average Nigerian school staff is not computer literate which is disappointing in this digital era, Some people studied computer applications or practised basic computer training, but computer training without continuous practical is as good as nothing as practice makes perfect. Computer illiteracy in this current age, ICT explosion is really a great challenge to any organization, talk more of an educational institution as almost all human activities depend on ICT is actually more important in schools than most organizations.

In average schools, ICT is needed for many tasks which include student enrolment; creation of student and staff records in a database; design and development of the school website; conduct of research by members of the academic and students; school administration for managerial purposes; student's assessments, exams and records. In order to solve these challenging problems and enable access to ICT in Nigerian schools, the government should work with the various educational boards (PPSB and UBEB) to set up and manage ICT centres in each school. These centres should work with the Board to ensure adequate computer training of school staff and students while maintaining all school systems and technologies for efficiency and productivity.

Purpose of the study

The purpose of the study is to investigate the challenges in utilizing Information and Communication Technology in teaching Basic Science and Technology in Secondary Schools in Rivers State. Specifically, the study is to

1. Find out if inadequate provision of ICT facilities affects the teaching of Basic Science and Technology.
2. Find out if the employment of unqualified Basic Science and Technology teachers affects the use of ICT in teaching Basic Science and Technology.
3. Find out if inadequate funding of schools affects the use of ICT in teaching Basic Science and Technology.
4. Find out if inadequate electricity power supply affects the use of ICT in teaching Basic Science and Technology.

Research Questions

The following research questions are drawn up to guide the study.

1. To what extent does inadequate provision of ICT facilities affect the teaching of Basic Science and Technology?
2. To what extent does employment of unqualified teachers affect the use of ICT in teaching Basic Science and Technology
3. To what extent does inadequate funding of schools affect the teaching of Basic Science and Technology?
4. To what extent does inadequate electricity power supply affect the use of ICT in teaching Basic Science and Technology?

Hypotheses

The following null hypotheses are postulated to be tested at 0.05 level of significance.

1. There is no significant difference in the opinions of the teachers and students about the extent to which inadequate provision of ICT facilities affects the teaching of Basic Science and Technology.
2. There is no significant difference in the opinion of the teachers and students about the extent to which unqualified Basic Science and Technology teachers affect the use of ICT in teaching Basic Science and Technology.

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3. There is no significant difference in the opinions of the teachers and students about the extent to which inadequate funding of schools affects the use of ICT in teaching Basic Science and Technology.
4. There is no significant difference in the opinion of the teachers and students about the extent to which inadequate electricity power supply affect the use of ICT in teaching Basic Science and Technology.

Methodology

The study adopted a descriptive survey design. The descriptive survey is a design where the peculiar characters of a population are studied through a sample which is deemed to be a representation of the population. The population of the study comprises 2122 students and 35 Basic Technology teachers from the 23 target secondary schools in Rivers State. The sample for the study was 794 respondents (teachers= 35, students= 759). Thus 33 students were selected and sampled from each school. A simple random sampling technique was adopted in the selection of students while teachers were not sampled due to their small population. Structured questionnaires were used as instruments to collect data from respondents. The questionnaire was structured in line with research questions. The instrument consists of three sections. Section A sought information about the respondent. Section B deals with the response key of very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). Section three deals with variables under each research question. According to Nwankwo (2013) stated that "the items are responded on a 4 point scale quantifies 1, 2, 3 and 4. The criterion means for 1, 2, 3 and 4 is 2.5. Based on this value, any item in the below case with a mean score of 2.5 and above is accepted as a constraint to the use of ICT in teaching Basic Science and Technology. The research instrument was validated by three experts in the field of study. This was enhanced owing to a series of corrections and criticism that was put in place before its final administration. The test re-test reliability approach was used to obtain data from thirty percent of the student and a hundred percent of the teacher's samples. The results of the test were processed with the Pearson product-moment correlation and a reliability coefficient of 0.85 was obtained, thereby guaranteeing the reliability of the instrument. The questionnaires were administered to the teachers and students directly by the researcher and three persons who were trained to be research assistants. The copies of the instrument were retrieved on the spot in some cases while in most cases; it was a few days after the administration. Mean and standard deviation were used to analyze the research questions, while the Z-test was used to test the hypothesis at a 0.05 level of significance.

Results

Research Question 1: To what extent does inadequate access to ICT facilities affect the teaching of Basic Science and Technology?

Table 1: Responses on Inadequate Provision of ICT Facilities.

S/N	Item Statement	Teachers			Students		
	Provision of ICT Facilities		**SD**	**Decision**		**SD**	**Decision**
1	Lack of free browsing centers in the school	3.59	0.56	VHE	3.70	0.49	VHE
2	Poor internet connectivity in the school	3.15	0.93	HE	3.47	0.77	HE
3	Lack of personal computers for students and teachers affects teaching and learning	3.47	0.51	HE	3.46	0.50	HE
4	Students and teachers are denied basic and professional information	3.26	0.67	HE	3.30	0.68	HE
5	Public schools lack functional ICT laboratories	3.50	0.66	VHE	3.49	0.65	HE
6	There are qualified laboratory assistants in public schools	1.56	0.79	LE	1.73	0.95	LE
7	Common laboratory materials are lacking in the laboratories	3.26	0.67	HE	3.38	0.67	HE
8	More than one student to a computer generates noise.	3.53	0.66	VHE	3.43	0.72	HE
	Average (Mean/SD)	**3.17**	**0.68**	**HE**	**3.25**	**0.69**	**HE**

Source: Field Study; 2021

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The result of Table 1 shows the respondents' responses on the inadequate provision of ICT facilities and how it affects the teaching of Basic Science and Technology in secondary schools in Rivers State. The result revealed that the teachers' responses to items 2, 3, 4 and 7 were inadequate to a High Extent (HE) while 1, 5 and 8 responded to a Very High Extent (VHE) but at a Low Extent on item 6. On the other hand, the students' responses on the inadequate provision of ICT facilities indicated that all the items were at High Extent (HE) except items 1 and 6 which were responded to be at Very High Extent (VHE) and Low Extent respectively.

Research Question 2: To what extent does employment of unqualified teachers affect the use of ICT in teaching Basic Science and Technology?

Table 2: Responses on Employment of Unqualified Teachers of Basic Science and Technology

S/N	Item Statement	Teachers			Students		
	Employment Of Unqualified ICT Teachers		**SD**	**Decision**		**SD**	**Decision**
9	Training and re-training of teachers on ICT will increase its use in teaching basic science and technology	3.03	0.81	HE	3.08	0.78	HE
10	Incompetency of teachers in the use of ICT reduces students' morale towards basic science and technology	3.59	0.62	VHE	3.62	0.56	VHE
11	Poor motivation hinders teachers' performance	3.56	1.11	VHE	3.57	0.71	VHE
12	Lack of commitment to academic work encourages service delivery	3.28	0.50	VHE	3.54	1.02	VHE
13	Teachers have poor attitude towards the need of the student	2.59	1.03	HE	2.96	0.88	HE
14	Teachers are not regular and punctual in class	2.53	0.86	HE	2.87	0.61	HE
15	Teachers do not use audio- visual aids in teaching basic science and technology.	2.62	0.95	HE	2.98	0.92	HE
16	Teachers are not able to demonstrate their best practical experience as a result of constant power failure	3.50	0.56	VHE	3.53	1.03	VHE
	Average (Mean/SD)	**3.09**	**0.80**	**HE**	**3.27**	**0.82**	**HE**

Source: Field Study; 2021

The result of Table.2 shows the respondents' responses on the employment of unqualified teachers and how it affects the use of ICT in teaching Basic Science and Technology in secondary schools in Rivers State. The result revealed that in the teachers' responses to items 9, 13, 14 and 15 the use of unqualified teachers affects the teaching of ICT to a High Extent (HE) while 10, 11, 12 and 16 responded as Very High Extent (VHE). On the other hand, the students' responses on the use of unqualified teachers in teaching ICT were shown to be at a High Extent (HE) on items 9, 13, 14 and 15 while items 10, 11, 12 and 16 were replied to be Very High Extent (VHE).

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Research Question 3: To what extent does inadequate funding of schools affect the use of ICT in teaching Basic Science and Technology?

Table .3: Responses on Inadequate Funding of Schools Affect the Use of ICT in Basic Science and Technology

S/N	Item Statement	Teachers			Students		
	Inadequate Funding of Schools		**SD**	**Decision**		**SD**	**Decision**
17	The government does not often provide laptops at a subsidized rate to teachers and students	3.21	0.62	HE	3.37	0.49	HE
18	Non-provision of sufficient electric power supply hinders the effective use of ICT in teaching basic science and technology	3.56	0.50	VHE	3.58	0.67	VHE
19	Failure of government to provide free browsing centres in all the public schools	3.62	1.11	VHE	3.26	1.09	HE
20	The refusal of the government to construct functional ICT laboratories In schools reduces performance.	3.47	0.51	HE	3.51	0.51	VHE
21	Lack of continuity in ICT projects executed by past governments.	3.53	0.50	VHE	3.55	1.04	VHE
22	The inability of government to provide adequate fund for the purchase and installation of ICT facilities	3.62	1.44	VHE	3.06	1.15	HE
23	Poor funding on administrative effectiveness.	3.56	0.65	VHE	3.54	1.01	VHE
24	Lack of relevant instructional materials	3.38	0.55	HE	3.36	0.82	HE
	Average (Mean/SD)	**3.49**	**0.74**	**HE**	**3.40**	**0.85**	**HE**

Source: Field Study; 2021

The result of Table .3 shows the respondents' responses on how inadequate funding of schools affects the use of ICT in teaching Basic Science and Technology in secondary schools in Rivers State. The result revealed that the teachers' responses to items 17, 20 and 24 show that funding of ICT in schools was inadequate to a High Extent (HE) while items 18, 19, 21, 22 and 23 were responded as Very High Extent (VHE). On the other hand, the students' responses on the inadequacy of funds to ICT facilities indicated that items 17, 19, 22 and 24 were at High Extent (HE) while items 18, 20, 21 and 23 were at Very High Extent (VHE) respectively.

Research Question 4: To what extent do inconsistencies in electricity supply affect the use of ICT in teaching Basic Science and Technology?

Table 4.: inconsistencies in electricity supply

S/N	Item Statement	Teachers			Students		
	Inconsistencies of electricity supply		**SD**	**Decision**		**SD**	**Decision**
25	Inconsistencies in power supply	3.71	1.12	VHE	3.71	0.65	VHE
26	Inability to conduct ICT lectures and conference	3.65	0.83	VHE	3.57	0.71	VHE
27	Lack of motivation to teachers and student.	3.18	1.03	HE	3.24	1.05	HE
28	Exposition to damage of ICT facilities and equipment due to unoperatonal usage	3.38	0.41	HE	3.42	1.01	HE
29	Discourages school head from purchasing necessary required ICT equipment and materials	2.74	0.65	HE	3.02	0.73	HE
30	It will result in irregularities in ICT research by teachers	2.68	0.76	HE	2.95	0.58	HE
31	It leads to poor academic performance	3.18	0.51	HE	3.21	0.66	HE
32	Do not encourage good pay package and	2.79	0.88	HE	2.93	0.81	HE

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	allowances for ICT teachers						
33	It keep schools behind	1.62	0.54	LE	1.89	0.52	LE
34	makes all rules and decisions difficult to implement	2.97	0.93	HE	3.08	0.80	HE
35	Inability to project lecturers	3.56	1.11	VHE	3.42	1.12	HE
	Average (Mean/SD)	**3.04**	**0.81**	**HE**	**3.13**	**0.78**	**HE**

Source: Field Study; 2021

The result of Table 4. shows the respondents' responses on the extent to which principals' administrative style affects the use of ICT in teaching Basic Science and Technology in secondary schools in Rivers State. The result revealed that the teachers' responses to items 27, 28, 29, 30, 31, 32 and 34 were on a High Extent (HE) while items 25, 26 and 35 were at a Very High Extent (VHE). On the other hand, the students' responses on principals' administrative style to ICT facilities indicated that all the items were at High Extent (HE) except items 25, 26 and 33 which were responded to be at Very High Extent (VHE) and Low Extent respectively.

Hypotheses Testing

The following null hypotheses are postulated to be tested at a 0.05 level of significance.

1. There is no significant difference in the opinions of the teachers and students about the extent to which inadequate ICT facilities affect the teaching of Basic Science and Technology.

Table 1.1: z-Test for Responses on Inadequate Provision of ICT Facilities in Basic Technology

Categories	Mean	SD	N	df	zcal	zcrit	Decision
Teachers	3.17	0.68	35				
				669	-1.27	1.960	Accepted
Students	3.25	0.69	636				

Source: Field Data, 2021 Accepted if zcal < zcrit; else Rejected

The null hypothesis is accepted since the zcal is less than zcrit. This implies that there is no significant difference in the opinions of the teachers and students about the extent to which inadequate provision of ICT facilities affects the teaching of Basic Science and Technology.

2. There is no significant difference in the opinions of the teachers and students about the extent to which employment of unqualified teachers affects the use of ICT in teaching Basic Science and Technology.

Table 2: z-Test for Responses on Employment of Unqualified in Teaching ICT

Categories	Mean	SD	N	df	zcal	zcrit	Decision
Teachers	3.09	0.80	35				
				669	-2.42	1.960	Rejected
Students	3.27	0.82	636				

Source: Field Data, 2021 Accepted if zcal < zcrit; else

The null hypothesis is rejected since the zcal is greater than zcrit. This implies that there is a significant difference in the opinions of the teachers and students about the extent to which employment of unqualified teachers affects the use of ICT in teaching Basic Science and Technology.

3. There is no significant difference in the opinions of the teachers and students about the extent to which inadequate funding of schools affects the use of ICT in teaching Basic Science and Technology.

Table 3: z-Test for Responses on Inadequate Funding in the Use of ICT

Categories	Mean	SD	N	df	zcal	zcrit	Decision
Teachers	3.49	0.74	35				
				669	1.28	1.960	Accepted
Students	3.40	0.85	636				

Source: Field Data, 2021 Accepted if zcal < zcrit; else Rejected The null hypothesis is accepted since the zcal is less than zcrit. This implies that there is no significant difference in the opinions of the teachers and students about the extent to which inadequate funding of schools affects the use of ICT in teaching Basic Science and Technology.

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4. There is no significant difference in the opinion of the teachers and students about the extent to which principals' administrative style affects the use of ICT in teaching Basic Science and Technology.

Table 4.: z-Test for Responses on Inconsistencies of Electricity Supply

Categories	Mean	SD	N	df	zeal	zcrit	Decision
Teachers	3.04	0.81	35				
				669	1.21	1.960	Accepted
Students	3.13	0.78	636				

Source: Field Data, 2021 Accepted if zcal < zcrit; else rejected

The null hypothesis is accepted since the zcal is less than zcrit. This implies that there is no significant difference in the opinion of the teachers and students about the extent at which inconsistencies of electricity supply affects the use of ICT in teaching Basic Science and Technology.

Conclusion

Based on the findings of the study, it was deduced that non-provision of sufficient electric power supply hinders the effective use of ICT in teaching Basic Science and Technology, poor funding of schools, lack of training and re-training of teachers on ICT in teaching Basic Science and Technology, lack of personal computers for students and teachers, lack of free browsing centres in the school, poor internet connectivity in the school etc were some of the constraints facing the use of Information Communication Technology in teaching Basic Science and Technology in secondary schools in Rivers State. The study found that if these constraints is tackled, teaching of Basic Technology with ICT will be enhanced in secondary schools in Rivers State.

Recommendations

Based on the findings the following recommendations were made;

i. Funds that have been allotted by the government for the implementation of ICT projects should be judiciously used by the schools and other concerned individuals.
ii. Corporate bodies, schools, private individuals, and government should from time to time organise in-service training or retraining programmes for teachers of Basic Technology on the use of ICT.
iii. Laptops should be provided at a subsidized rate to teachers and students.
iv. internet centres should be opened on school premises to enhance effective teaching and learning.

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