

Information and communication technologies (ICTs) for effective educational service provision in public senior secondary schools in Rivers State, Nigeria

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Abstract

The research examined how information and communication technologies (ICTs) are used in public senior secondary schools to provide effective educational services in Rivers State, Nigeria. Descriptive survey design was adopted in the study. The population consisted of seven thousand, one hundred seventy-nine (7179) teachers and administrators from which a sample of seven hundred and eighteen (718) (10%) was used for the study. For the purpose of collecting data, a self-constructed questionnaire entitled: "Use of Information and Communication Technologies for Effective Educational Service Provision Questionnaire (UICTEESPQ)" was used. The research questions were answered with mean and standard deviation while the hypotheses were tested using z-test at a 0.05 level of significance. The revealed ICT tools such as projectors, radios, and televisions were not used to their full potential because of a lack of appropriate skills, a shortage of ICT support personnel, and a lack of funding, among other factors. It was therefore recommended, among others, that periodical evaluation of the present information and communication technology tools should be used in order to identify information and communication technology that is urgently required in public schools in Rivers State.

Keywords: Information and communication technologies, effective educational service provision, effective instructional delivery, public senior secondary schools, Rivers State, Nigeria

Introduction

Information and communication technology (ICT) have given society a wide range of new communication possibilities since the recent decades. A notable example is the ability to communicate in real time with individuals who are located elsewhere; thanks to technical aids like video conferencing and instant messaging applications. Users from all over the globe were able to stay in touch and converse on a daily basis even while almost the whole world was under lockdown because to social networking tools like zoom, which gained popularity notably during the COVID-19 and post-COVID-19 periods. Additionally, tertiary colleges have benefited from using ICT, which is seen in the distance learning centres spread throughout several higher educational institutions (Orji, 2016).

Concerns about the necessity for computing skills in daily life arose as computers and technology applications proliferated in society. A lot of schools bought computers based on this justification as public awareness of the need for computer

literacy increased. The ubiquity and accessibility of internet-based services like electronic mail and the World Wide Web made the 1990s the decade of computer communications and information access. At the same time, packaged software distribution adopted the CD-ROM as the industry standard (replacing the floppy disk). Large information-based software products like encyclopedias might then be quickly and cheaply delivered thanks to this. As a consequence, educators began to place greater emphasis on the use of technology to enhance student learning (Opoku, 2020).

Objectives of the study

The primary objective of the study was to investigate how information and communication technologies (ICT) are used to deliver effective educational services in public senior secondary schools in Nigeria. The research specifically set out to:

1. Determine the extent to which overhead projectors are used for effective instructional delivery in

public senior secondary schools in Rivers State.

2. Explore the extent radio and television sets are used for effective instructional delivery in the administration of public senior secondary schools in Rivers State.

Research questions

The following research questions are answered in the study:

1. To what extent are overhead projectors used for effective instructional delivery in the public senior secondary schools in Rivers State?
2. To what extent are radio and television sets are used for effective instructional delivery in the administration of public senior secondary schools in Rivers State?

Hypotheses

The following hypotheses are tested at 0.05 level of significance:

- H₀₁: There is no significant difference between the mean ratings of principals and teachers of public senior secondary school on overhead projector used for effective instructional delivery in public senior secondary schools in Rivers State.
- H₀₂: There is no significant difference between the mean ratings of principals and teachers of public senior

secondary schools on radio and television sets used for effective instructional delivery in public senior secondary schools in Rivers State.

Methods

The study adopted the descriptive survey design. The population consisted of seven thousand, one hundred seventy-nine (7179) teachers and administrators in all the 286 public secondary senior secondary schools in Rivers State, Nigeria. These schools were spread out throughout the 23 local government areas (LGA) in Rivers State. Seven hundred and eighteen (718) respondents (10%) of the entire population constituted the study's sample size. The stratified random sampling technique was used. A self-constructed questionnaire entitled: "Use of Information and Communication Technologies for Effective Educational Service Provision Questionnaire (UICTEESPQ)" was used as data collection instrument. The collected data were analysed using mean and standard deviation to answer the research questions and z-test to test the null hypotheses at 0.05 level of significance. The data were analysed with the Statistical Package for Social Sciences (SPSS) version 23.

Results

The results of the study are presented in this section.

Table 1: Gender of the respondents

Gender	Frequency	%
Male	334	51.7
Female	312	48.3
Total	646	100

Table 1 reveals men made up the majority of participants (F=334, 51.7%), while women

made up the remaining participants (F=312, 48.3%).

Table 2: Status of the respondents

Status	Frequency	%
Teachers	617	95.5
Principals	29	4.5
Total	646	100

Table 2 indicates that teachers made up the higher number of participants [F=617(95.5%)],

Research question one: To what extent are overhead projectors used for effective

instructional delivery in the public senior secondary schools in Rivers State?

The data in Table 3 are used to answer this question.

Table 3: Mean and Standard Deviation on the extent to which overhead projectors are used for effective instructional delivery in public senior secondary schools in Rivers State N=646

S/N	Items	\bar{x}	SD	Remark
1.	Projectors are applied by teachers as it is used in displaying models for effective teaching process and good lesson delivery.	1.63	0.94	Low Extent
2.	Projectors are applied as audio – visual materials in teaching and learning.	1.82	1.05	Low Extent
3.	Projectors are applied by principals as they use it for seminars presentations in training of staffs etc.	1.95	1.14	Low Extent
4.	Projectors are applied by teachers in teaching as it will facilitate cognitive learning of students.	1.93	1.15	Low Extent
5.	Projectors are applied by teachers as it helps to clarify concepts for effective understanding.	1.72	1.16	Low Extent
6.	Application of projectors in teaching and presentations minimizes sight problems as it is very clear to the viewers.	2.36	0.90	Low Extent
7.	Projectors are applied by teachers as it is used to display pictures and video clips of day to day lessons.	2.13	1.00	Low Extent
Grand mean & SD		2.02	1.05	Low Extent

Criterion mean: 2.50

The use of overhead projectors for effective instructional delivery in public senior secondary schools in Rivers State was evaluated using seven (7) items in Table 3. All of the tested 7 items, have mean values that varied between 1.63 and 2.36, which fall short of the required mean score of 2.50. As a

result of the grand mean score of 2.02, it can be concluded that overhead projectors are only sometimes used for efficient instructional delivery in public senior secondary schools in Rivers State. The respondents indicated that to very low extent, overhead projectors are not considerably used

by teachers as they are used in displaying models, as audio-visual materials in teaching and learning, by principals as they use it for seminar presentations, by teachers in teaching, as it facilitates students' cognitive learning, by teachers as it helps to clarify concepts.

Research question 2: To what extent are radio and television sets used for effective instructional delivery in the administration of public senior secondary schools in Rivers State?

This question is answered with data in Table 4.

Table 4: Mean and Standard Deviation on the extent to which radio and television sets are used for effective instructional delivery in the administration of public senior secondary schools in Rivers State

N=646				
S/N	Items	\bar{x}	S.D	Remark
1.	Principals apply radios and televisions to send messages to school community.	2.43	1.03	Low Extent
2.	Radio and television are applied as informative tools for teachers and principals.	2.41	1.21	Low Extent
3.	Radios and televisions are applied as its programmes enhance the skills of the teachers and principals.	2.44	1.19	Low Extent
4.	Television and radio are applied in instructional delivery as it serves as a means of advertisement, an administrative tool used by principals to advertise the school.	2.15	1.09	Low Extent
5.	Radios and television medium are applied by the teachers as they use it in presenting educative programmes to the general public.	2.06	0.91	Low Extent
6.	Radios and televisions are applied in passing information about the school to the students and parents by both teachers and principals.	2.35	0.90	Low Extent
7.	Principals apply radios and televisions to create awareness about the school.	2.16	0.87	Low Extent
Grand mean & SD		2.29	1.03	Low Extent
Criterion mean: 2.50				

In Table 4, seven (7) items were evaluated to see how well radio and television were used in senior secondary public schools in Rivers State. The mean scores of all the evaluated items, which were numbered 1 to 7, varied from 2.06 to 2.44, falling short of the criterion mean score of 2.50. Given that the overall grade point average in public senior secondary schools in Rivers State was 2.29,

this indicates that radio and television were not effectively used as information and communication technology instruments for effective educational delivery to high degrees. The respondents therefore indicated that radio and television are not effectively used in public senior secondary schools in for communicating with the school community, educating teachers and principals, enhancing

programming, presenting educational content for the general public, informing students and parents about the school, and raising awareness of the need for effective instructional delivery.

Test of hypotheses

Hypothesis 1: There is no significant difference between the mean ratings of

principals and teachers of public senior secondary school on how overhead projector for effective instructional delivery in public senior secondary schools in Rivers State.

This hypothesis is tested with the data in Table 5.

Table 5: z -test Analysis on the significant difference between the mean ratings of principals and teachers on the application of overhead projector as an ICT tool for effective instructional delivery in public senior secondary schools in Rivers State

Source of Variation	N	Mean	Variance	SD	Df	z-cal.	z-crit.	Sig.	Decision
Teachers	687	2.35	0.94	0.97	644	0.79	±1.96	0.05	Not Sig.
Principals		2.26	0.92	0.96					

Table 5 summarizes the mean, variance, standard deviation, and z-test of the difference between the mean evaluations of teachers and principals on this topic. The table reveals that teachers' mean and standard deviation scores are 2.35 and 0.97, respectively, while principals' values are 2.26 and 0.96. The z-calculated value used to test the hypothesis is 0.79, and employing 644 degrees of freedom, the z-critical value is 1.96. The estimated z-test result of 0.79 is less than the z-critical value of 1.96 at the 0.05 level of significance, hence the null hypothesis is accepted. Since overhead projectors are used as an information and communication technology tool for efficient

instruction delivery in public senior secondary schools in Rivers State, there is no discernible difference in the mean ratings of teachers and principals in this regard.\

Hypothesis 2: There is no significant difference between the mean ratings of principals and teachers of public senior secondary school on how radio and television sets as an Information and communication technology tool is applied for effective instructional delivery in public senior secondary schools in Rivers State.

This hypothesis is tested with the data in Table 6.

Table 6: z -test analysis on the significant difference between the mean ratings of principals and teachers on the application of radio and television sets as an ICT tool for effective instructional delivery in public senior secondary schools in Rivers State

Source of Variation	N	Mean	Variance	SD	Df	z-cal.	z-crit.	Sig.	Decision
Teachers	617	2.33	1.19	1.09	644	0.71	±1.96	0.05	Not Sign.
Principals	29	2.38	1.21	1.10					

Table 6 provides a summary of the mean, variance, standard deviation, and z-test of the difference between the mean evaluations of teachers and principals on this topic. In contrast to administrators, who have mean and variance scores of 2.38 and 1.10, teachers

have mean and variance scores of 2.33 and 1.09, respectively. The z-calculated value that is utilized to test the hypothesis is 0.71, and the z-critical value, employing 644 degrees of freedom, is 1.96. The estimated z-test result of 0.71 is less than the z-critical value of 1.96

at the 0.05 level of significance, hence the null hypothesis is accepted. The use of radios and television as information and communication technology tools for successful instructional delivery in public senior secondary schools in Rivers State is therefore not significantly different in the mean ratings of teachers and principals.

Discussion

The first research question and first null hypothesis were used to test the aim. The questionnaire's B section's items 1 through 7 were thoughtfully written to provide an answer to this query. The overall average was 2.02 (SD=1.05), showing that respondents from the secondary schools under investigation were only somewhat in agreement that overhead projectors are used as ICT tools to give successful education in the management of public senior secondary schools in Rivers State. According to Table 3 findings, the degree of freedom is 644, the z-calculated value is 0.79, the z-critical is 1.96 at the 0.05 level of significance, and the z-critical value is. The null hypothesis number three is maintained since the z-calculated value is smaller than the z-critical value of 1.96. This suggests that the overhead projector is effectively used as an ICT tool for successful instruction delivery in public senior secondary schools in Rivers State, based on the mean evaluations of principals and instructors at public senior secondary schools. It was discovered that instructors (mean=2.35; SD=0.97) utilize overhead projectors more often for effective instruction delivery than do principals (mean=2.26; SD=0.96).

Adegbemile (2012) did study on "information and communication technology (ICT) availability and usage in administration of secondary schools in Kaduna State, Nigeria," and came to similar conclusions. The findings showed that Kaduna State's available ICT resources, like overhead projectors, were insufficient in schools and that there was cause for concern regarding how well they were being used. Male and

female principals held similar views on the availability of ICT resources and their use in managing secondary schools. The results are consistent with Menjo and Bolt's (2012) conclusion that secondary schools did not properly employ ICT tools such overhead projectors as administrative tools to handle administrative concerns. It was used mostly for administrative tasks, notably in education, and to a lesser degree for certain clerical tasks. The researchers believe that in order for information and communication technology to be used and implemented successfully, facilities like overhead projectors should be made accessible.

The null hypothesis was used to test the aim and research question second to confirm it. The B section of the questionnaire's items 1-7 were carefully written to respond to this question. The secondary school respondents who participated in the survey agreed to a low degree that radio and television sets are used as ICT tools for efficient education in the management of public senior secondary schools in Rivers State, as shown by the grand mean of 2.29 (SD=1.03). As shown in Table 5, the degree of freedom is 644, the z-calculated value is 0.71, the z-critical is 1.96 at the 0.05 level of significance, and the z-critical is 1.96. The null hypothesis number four is kept since the z-calculated value is lower than the z-critical value, which is 1.96. This suggests that there are no significant differences in the principals' and teachers' mean assessments of the public senior secondary schools' use of radio and television as ICT tools for successful instruction delivery in Rivers State. The results also demonstrated that, in comparison to teachers, who used radio and television sets more often for effective education (mean=2.38; SD=1.10), principals utilize these devices more frequently overall.

This result is consistent with Orji's (2016) investigation on the use of ICT for efficient instruction delivery in Rivers State Universities. The study's conclusions showed that the barriers to implementing radio and

television as an ICT tool for efficient university administration include a lack of stable educational policies, technological limitations, inadequate facilities to enhance information and communication technology, underfunding, and political instability.

The study's findings concur with those of Ajayi and Haastrup (2009), who found that schools lacked ICT resources like radio and television sets and that instructors had very limited exposure to the usage of such devices as ICT tools. The researchers believe that in order for information and communication technology devices like radios and televisions to be efficiently exploited and deployed, they need be made accessible.

Conclusion

This study has shown that overhead projectors, radios, and television sets were only minimally used for effective instructional delivery in public senior secondary schools in Rivers state, and that the overhead projector was not used at all. The results showed that there is no statistically significant difference between the mean ratings of principals and teachers of public senior secondary schools regarding the effective application of overhead projectors, radios, and television sets as an ICT tool for instructional delivery in public senior secondary schools in Rivers State. The results also showed that solutions to lessen the drawbacks of using ICT in the management of public senior secondary schools in Rivers State included better power supply, enough financing for supplying ICT resources, and the employment of competent individuals in administering ICT software. The results showed that there is no statistically significant difference between the mean ratings of principals and teachers of public senior secondary schools regarding the effective application of overhead projectors, radios, and television sets as an ICT tool for instructional delivery in public senior secondary schools in Rivers State. The results also showed that solutions to lessen the drawbacks of using ICT in the management

of public senior secondary schools in Rivers State included better power supply, enough financing for supplying ICT resources, and the employment of competent individuals in administering ICT software.

The following recommendations are made based on the findings:

1. The government, NGOs, and other stakeholders should make efforts to provide information and communication technology tools in Rivers State's public schools.
2. Teachers and principals in Rivers State's public schools should make an effort to use the information and communication technology resources available for teaching and learning.
3. Regular evaluation of the information and communication technology resources should be carried out order to identify the public schools in Rivers State that urgently need information and communication technology.
4. NGOs, big corporations, and private individuals should support the government by providing ICT equipment to schools in their regions.

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Judith O. Patrick: Information and communication technologies (ICTs) for effective educational service provision in public senior secondary schools in Rivers State, Nigeria

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