**Managing ICT Resource-Based Teaching and Student's Learning Outcomes in Public Junior Secondary Schools in Delta State**

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## Abstract

This research project explores the impact of managing Information and Communication Technology (ICT) resource-based teaching on students' learning outcomes in public junior secondary schools within Delta State, Nigeria. The study investigates the utilization of ICT resources in teaching and its influence on the academic performance and educational experiences of students. The research employed a quantitative method to collect and analyze data. The study focused on carefully selected sample of public junior secondary schools within Delta State, considering variables such as the availability of ICT resources, teacher training, and the socio-economic backgrounds of students. By examining these variables, the research aimed to identify the factors that influence the effective management of ICT resource-based teaching and its correlation with students' learning outcomes. The research provided recommendations and insights into strategies for optimizing ICT resource management in educational settings to enhance teaching and learning outcomes. This project contributes to the broader discourse on educational technology integration and underscores the importance of effectively managing ICT resources in Nigerian public schools.

**Key words:  ICT Resource-Based Teaching, Students' Learning Outcomes, Public Junior Secondary School.**

## Introduction

Information and communication technology (ICT) has become an important source of innovation and improvement of efficiency for many sectors across the globe. In the education sector, the application of ICT has become a critical part of the learning process for secondary school students both outside and inside the classroom setting. According to Shayoob, (2019),

some stakeholders consider the ICT as an effective learning tool and have invested huge amount of money to adopt ICT in the education system during the last two decades. Okai (2013) suggests that effective communication of ICT skills and knowledge enhances school goal attainment, most especially secondary schools that have fully adopted ICT have recorded immense advancement in terms of learning outcome and improvement of teaching methods. It is, however, not clear what effect the ICT applications have on the performance and achievement of students.

ICT adoption in this study is understood as a gradual switching over to automation of the educational process not only in administrative activities like students' admission, registration, and evaluation but also developing a customized learning management system (LMS) and transferring all the subjects and the related data onto it. Teachers and students are allowed access to the LMS along with its all services and the specialized online learning tools. According to Hamidi, Meshkat, Razaee and Jafari (2020) ICT is rarely seen as central to the overall learning process rather it is adopted for the purpose of emphasis. According to them, even in the most advanced schools in OECD countries, ICT generally is not considered central to the teaching and learning process. They further noted that ICT in education initiatives in many less developed countries seek (at least in their rhetoric) to place ICTs as central to teaching and learning.

On the other hand, strong advocates of ICT based learning are of the view that the use of ICT makes learning easier for the learner and reduces the task of the teachers as illustrations can easily be made with the use of ICT. According to Chien et al., (2020), ICT is a tool for effective instructions of weak learner, who through repetitive illustrations can comprehend what they may not be able to understand at first instance in the classroom. .

Learning outcome or students' academic performance refers to the enhancement of the students' current state of knowledge and skills reflected in their result averages and also in the formulation of their personality and academic growth from lower levels of study to higher levels which is in line with Gulbahar and Guven (2018) who opined that the adoption of ICT use in teaching and learning improves learning outcome.. The rationale of studying academic performance in the context of ICT adoption is to present a significant relationship that exists between the two variables.

Teaching and learning are moving from the traditionally method to a more technological method in the educational system around the globe today using information and communication technology (ICT) resources. ICT resource-based teaching is important resources use in teaching and learning process which improves the students' learning

outcomes compared to the traditional methods of teaching. But these facilities are probably in short supply in most of the public junior secondary school s in Nigeria today and perhaps posing challenges in teaching and learning processes.

This paper is intended to examine ICT resource-based teaching and students learning outcome in public junior secondary school in Delta State with a view to identifying the problems and foster a lasting solution to the identified problems. The aim and objectives of this study is to examine ICT resource-based teaching and students' learning outcomes in public junior secondary school in Delta State.

**Specific objectives of the study**

(i) Ascertain the extent the use of projector as ICT resource-based teaching influence students' learning outcome in public junior secondary schools in Delta State;

(ii) Examine the extent the use of Power Point as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State;

(iii) Investigate the extent the use of Internet facilities as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State.

**Hypotheses**

The following hypotheses were postulated and statistically tested at 0.05 level of significance

$H_{01}$ There is no significant relationship between the use of projector as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

$H_{02}$ There is no significant relationship between the use of Power Point as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

$H_{03}$ There is no significant relationship between the use of Internet facilities as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

**Theoretical Framework**

This study was anchored on Field Theory of Learning: Kurt Lewin (1930) cited in Ajayi, (2008). According to the theory, learning is not a mechanistic process of connecting stimuli and response within a biological organism. Field psychology explains development of insight as a change in cognitive structure of life-space. Thus, the environment (which include the classroom) in this theory is seen as a major factor that shapes human behaviour including learning. This means that academic achievement depends not only on the learner's cognitive or intellectual ability but also on the learner's interaction with the environment. In an environment where the students interact with ICT, there are bound to be changes in their

learning pattern (Admiraal, et al., 2021). Hence, this theory is relevant to this study as it portrays the need for teachers possess the ability to utilize ICT tool and use same to enhance the learner through ICT enhanced teaching and learning. The theoretical frame work thus far has exposed the importance of teachers possessing and applying ICT skills in their daily routine, and the possible impact on their student's learning behaviour and academic performance.

**Methodology**

This study adopted a correlation survey design. The population of the study consisted of seventy-five (75) teachers in the three (3) public junior secondary school s in Delta north senatorial zone. The sample size of the study were 75 teachers in the purposively chosen three public junior secondary schools in Delta State. The choice of these schools is considered to make the sample fairly moderate for a fair representation and generalization of the study. A proportionate stratified random sampling technique were used for selecting the teachers in the respective schools for the study.

The instrument for data collection was a self-developed questionnaire titled: ICT Based Teaching Questionnaire (ICTRBTQ) and Students Learning Outcome Questionnaire (SLOQ) in Public Junior secondary schools in Delta State. The questionnaire consisted of three sections, section A, section B seeks information on ICT Based Teaching Questionnaire (ICTBTQ) and section C deals with the questions items on Students Learning Outcome Questionnaire (SLOQ). The respondents were basically the teachers. The response patterns was on a 4-point Likert scale patterns as very high extent (VHE), high extent (HE), low extent (LE), and very low extent (VLE). The instrument for this study was given face and content validation by an expert in measurement and evaluation, in the department of Educational Administration, from University of Delta, Agbor, in Affiliation with Delta State University, Abraka. The corrections, suggestions and inputs were incorporated into the final copies of the instrument. To determine the reliability of the instrument, the test-retest method was adopted and the reliability index of 0.73 was obtained. The ICT Based Teaching Questionnaire (ICTRBTQ) and Students Learning Outcome Questionnaire (TLOQ) were administered by the researchers to the respondents. In analyzing the data for the study, mean and standard deviation statistics were utilized to analyse tthe research questions while linear regression analysis were used to test the hypotheses at a 0.05 level of significance. With the aid of SPSS computer package and Microsoft Excel version 13 the data collected were analyzed.

**Result**

The table 1.0 shows the gender of the respondents. 36 of about 48% teachers are male while only 39 of about 52% teachers are female. The table shows the age of the respondents. 5 persons between 20-25 years of about 6.7%% teachers, those within the age bracket of 26 to 30 years were 14 persons representing 18.7% while 37 persons representing 49.3% were between 31-35 years.

The remaining 19 persons representing 25.3% were forty-years and above. The above table shows the qualification of the respondents. 5 (6.7%) teachers had NCE, 43 of about 57.3% teachers had B.Ed., and 24 teachers of about 32.0% had M.Ed., while only 3 teachers of about 4.0% have Ph.D.

**Research Questions**

**Table 2: table showing results for the research questions**

| S/NO | ITEM | VHE | HE | LE | VLE |
|---|---|---|---|---|---|
| 1. | The use of projector enhances students' ability to understand effectively in the classroom | 65 (86.7%) | 10 (13.3%) | 0 (0.0%) | 0 (0.0%) |
| 2. | Audios and video CDs equipment are displayed on projector by teachers improving students learning outcome | 68 (90.7%) | 7 (9.3%) | 0 (0.0%) | 0 (0.0%) |
| 3. | Daily utilization of projector by teacher in the classroom increase student learning outcome | 68 (90.7%) | 7 (9.3%) | 0 (0.0%) | 0 (0.0%) |
| 4. | Teachers lack skills of using projector in the classroom for students learning outcome | 29 (38.7%) | 27 (36.0%) | 19 (25.3%) | 0 (0.0%) |
| 5. | School teachers lack accountability on utilization of projector in the classroom affect students learning outcome | 20 (26.7%) | 31 (41.3%) | 24 (32.0%) | 0 (0.0%) |
| 6. | Teachers in ability to prepare power point affect students learning outcome | 68 (90.7%) | 7 (9.3%) | 0 (0.0%) | 0 (0.0%) |
| 7. | The use of power point as teaching aid enhances students learning outcome | 64 (85.3%) | 11 (14.7%) | 0 (0.0%) | 0 (0.0%) |
| 8. | Daily utilization of power point in teaching prepare student for technological age | 67 (89.3%) | 8 (10.7%) | 0 (0.0%) | 0 (0.0%) |
| 9. | When objects are displayed on power point, it enhances students learning outcome | 65 (86.7%) | 10 (13.3%) | 0 (0.0%) | 0 (0.0%) |
| 10. | The ability to engage students with assignment in the use of power point affect their learning outcome positively | 67 (89.3%) | 8 (10.7%) | 0 (0.0%) | 0 (0.0%) |
| 11. | In recent age, internet has contributed to students learning outcome especially in | 69 (92.0%) | 6 (8.0%) | 0 (0.0%) | 0 (0.0%) |
| 12. | The cost of internet services among teachers and students affects students | 38 (50.7%) | 37 (49.3%) | 0 (0.0%) | 0 (0.0%) |

| | | | | |
|---|---|---|---|---|
| learning outcome. | | | | |
| 13. Poor internet server affects student learning outcome | 69 (92.0%) | 6 (8.0%) | 0 (0.0%) | 0 (0.0%) |
| 14. The provision of free internet services increases students learning outcome | 48 (64.0%) | 27 (36.0%) | 0 (0.0%) | 0 (0.0%) |
| 15. Teachers' ability to effectively use internet in teaching enhances students learning outcome | 61 (81.3%) | 14 (18.7%) | 0 (0.0%) | 0 (0.0%) |

**SPSS Output 2023**

The table 2 above shows the response rate for question item one which seeks to know how the use of projector enhances students' ability to understand effectively in the classroom. The respondents revealed that the use of projector has very high extent in enhancing students effective learning with 65 (86.7%) while to a very high extent was rated 10 (13.3%). Audios and video CDs equipment are displayed on projector by teachers improving students learning outcome was also found to be 68 (90.7%) with very high extent and 7 ( 9.3%) high extent while item three on Daily utilization of projector by teacher in the classroom increase student learning outcome was found to affect students by 68 (90.7%) VHE and 7 (9.3%) high extent respectively.  Teachers lack skills of using projector in the classroom for students learning outcome was also found to be 29 (38.7%) very high extent, 27 (36.0%) and 19 (25.3%) high extent and low extent respectively. School teachers lack accountability on utilization of projector in the classroom affect students learning outcome was found to be 20 (26.7%) very high extent, 31 (41.3%) high extent and 24 (32.0%) low extent. On the overall, the respondents agreed that the use of projector as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State.

**To what extent does the use of power point as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State?**

The table 3.0 shows response rate for the use of Power Point as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State. The response revealed that Teachers in ability to prepare power point affect students learning outcome was 68 (90.7%) for Very high extent and 7 ( 9.3%) for high extent while The use of power point as teaching aid enhances students learning outcome was found to be 64 (85.3%) for very high extent and 11 (14.7%) for high extent.

Daily utilization of power point in teaching prepare student for technological age was found to be 67 (89.3%) and 8 (10.7%) for very high extent and high extent respectively. When objects are displayed on power point, it enhances students learning outcome was also found to be 65 (86.7%) for very high extent and 10 (13.3%) for high extent while The ability to

engage students with assignment in the use of power point affect their learning outcome positively was found to be 67 (89.3%) for very high extent and 8 (10.7%) for high. The respondents agreed that the use of Power Point as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State.

**To what extent does the use of Internet as an ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State?**

The table below shows the response to the use of Internet as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. The response revealed that in recent age, internet has contributed to students learning outcome especially in indicate that to very high extent WAS 69 (92.0%) while high extent was found to be 6 (8.0%). The cost of internet services among teachers and students affects students learning outcome was 38 (50.7%) for very high extent, 37 (49.3%) for high extent; Poor internet server affects student learning outcome was 69 (92.0%) for very high extent, 6 (8.0%) for high extent; the provision of free internet services increases students learning outcome was 48 (64.0%) for very high extent and 27 (36.0%) for high extent and Teachers' ability to effectively use internet in teaching enhances students learning outcome was found to be 61 (81.3%) while high extent was found to be 14 (18.7%). The respondents agreed that the use of Internet as an ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State.

**Testing of Hypotheses**

**Table 3: Hypothesis testing**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 6342.651 | 1 | 6342.651 | 43.6 | 0.000[b] |
| | Residual | 201.63 | 198 | 25.387 | | |
| | Total | 6543.714 | 199 | | | |
| **Model** | | **Sum of Squares** | **Df** | **Mean Square** | **F** | **Sig.** |
| 2 | Regression | 6343.735 | 1 | 6343.735 | 44.6 | 0.001[b] |
| | Residual | 200.64 | 198 | 25.379 | | |
| | Total | 6542.723 | 199 | | | |

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | |
| 3 | (Constant) | 0.462 | 1.450 | | 3.504 | .000 |
| | Vas | 0.351 | 0.675 | 0.876 | 1.382 | .003 |

a. Dependent Variable : ELP

b. Predictors: (Constant), VAs

The following hypotheses were postulated and statistically tested at 0.05 level of significance using linear regression analysis with the aid of SPSS Computer package.

**$H_{01}$: There is no significant relationship between the use of projector as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.**

The results from the table of analysis for hypothesis one shows that there is a significant relationship between the use of projector as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State, where $p < 0.05$). The implication of this result is that the respondents agreed that the use of projector as ICT resource-based teaching does affect students' learning outcome in public junior secondary school s in Delta State. Thus, the hypothesis was rejected.

**$H_{02}$: There is no significant relationship between the use of Power Point as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.**

The results from the table of analysis for hypothesis two shows that there is a significant relationship between the use of Power Point as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State, where $p < 0.05$). The implication of this result is that the respondents agreed that the use of Power Point as ICT resource-based teaching does affect students' learning outcome in public junior secondary school s in Delta State. Thus, the hypothesis was rejected.

**$H_{03}$: There is no significant relationship between the use of internet facilities as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.**

The results from the table of analysis for hypothesis three shows that there is a significant relationship between the use of Internet facilities as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State, where $p < 0.05$). The implication of this result is that the respondents agreed that the use of internet facilities as ICT resource-based teaching does affect students' learning outcome in public junior secondary school s in Delta State. Thus, the hypothesis was rejected.

**Findings**

The respondents agreed that there is a significant effect on learning outcome when projectors as ICT resource-based teaching are used in teaching and learning. The respondents agreed that there is a significant effect on learning outcome when the uses of power point as ICT resource-based teaching are used in teaching and learning. The respondents agreed that there is a significant effect on learning outcome when the applications of internet as ICT resource-based teaching are used in teaching and learning. The result from hypothesis one revealed that there is a significant relationship between the use of projector as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. The result from hypothesis two revealed that there is a significant relationship between the use of power point as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. The result from hypothesis one revealed that there is a significant relationship between the use of internet as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

**Discussion of Findings**

The findings summarized above were elaborately discussed to give a more factual and holistic backing to the study. Hypotheses one of the study states that there is no significant relationship between the uses of projector as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State. The hypothesis was rejected because the use of projector has a significant relationship with students learning outcome in public junior secondary school s in Delta State. As evidenced by the result of our analysis; this finding is in line with Hussain et al. (2017) who suggest that the use of projector can significantly improve students' learning outcomes, such as achievement and retention.

Consequently, teachers and students alike find projectors to be useful classroom devices. Projectors can be used to cater for a wider variety of needs through the presentation tools it offers. It can be used to view educational films, show lesson presentations or even to get students involved with interactive slides. Many teachers find chalkboards to be almost a thing of the past with the advent of projectors in the classroom. Rather than writing notes across a board, teachers can make use of PowerPoint presentations, images and even film as teaching tools through the use of projectors. The use of projector in the classroom enables teachers to adapt in the use creative instructional approaches to teach students (Ismail and Salih, 2018). Dwyer and Lamberski (2013), who states that power point helps structure the content and processing of a lesson or lecture. The use of power point make teaching and learning process

easy most especially advance countries, with power students present their assignments, seminar and pass other information in the school. Ufomba (2022), reports that students liked the lecture outline and graphs on the screen, and that the power point presentation had a positive influence on students. Harrison (2009) argues that power point enhances instruction and motivates students to learn. Research has shown that attention plays an important role in determining when and how information is further processed from sensory registers to short and long-term memory.

## Conclusion

Based on the findings of the study it was revealed that there is significant relationship between ICT resources-based teaching and students learning outcome in public junior secondary school s in Delta State. Hence, it was concluded that Managing ICT resources-based teaching facilities enhances, and optimise the delivery of information to students in conjunction with preparing students for the current digital era to the capability of ICT in providing dynamic and proactive learning outcome of public junior secondary school s in Delta State.

## Recommendations

Delta state government should make projectors and their accessories available in public junior secondary schools in Delta State. The Delta state government should in conjunction with the state ministry of education organize workshops, seminars and conferences to educate teachers on how to effectively use power point slides to improve students learning outcome in public junior secondary schools in Delta State. Delta State government in conjunction with the state ministry of education should make sure there is strong internet connection in public junior secondary school in Delta State. There should be proper coaching on the use of the smart board in public junior secondary schools as well as making funds available for the purchase more computer and training operators in public junior secondary school s in Delta State.

## Contribution to Knowledge

The study made immense contribution to the body of knowledge in the use of ICT resource based teaching in line of projector, power point, internet, smart board, and computer as evidenced by the reaction of the respondents on the study questionnaire issued to teachers of public junior secondary schools in Delta State.

**Ethical Consideration of the Study**

All information gathered for the study was used only for the purpose of the study. The identities of the respondents were not disclosed in the study. The instrument was administered to the right respondents. The appropriate statistics were used to answer the research questions and test the hypotheses.

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