INTEGRATING SMART BOARDS AND COMPUTERS INTO TEACHING METHODOLOGIES FOR ENHANCED EDUCATIONAL MANAGEMENT AND STUDENT LEARNING IN DELTA STATE.

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Abstract

This study investigated the pedagogical integration of smart boards and computers within teaching methodologies and curriculum frameworks to enhance student learning experiences in Delta State. The research delved into the strategic adoption and application of Information and Communication Technology (ICT) tools in the educational management landscape, specifically focusing on their integration into teaching practices and the curriculum structure at the junior secondary level. Utilizing a mixed-method approach involving surveys, interviews, and classroom observations, this study evaluated the effectiveness of these ICT resource utilization in elevating student engagement, knowledge retention, and academic performance. It assessed the challenges faced by educators in incorporating these ICT tools seamlessly into pedagogical practices and curriculum execution, alongside identifying successful strategies for their effective implementation. Findings from this research provided insights into the nuances of integrating ICT resources into teaching methodologies, highlighting successful approaches and their impact on student learning experiences. The study's outcome aimed to guide educational policymakers, school administrators, and educators in Delta State toward optimized utilization of ICT resources for improved pedagogy and enriched student learning outcomes.

Keywords: Integration, Smart boards, Computers, Teaching Methodologies and Learning Experiences

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 Albini (2020), 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. The integration of Information and Communication Technology (ICT) into educational frameworks marks a transformative shift in enhancing teaching methodologies and enriching student learning experiences. This study delves into the pedagogical integration of ICT resources within the teaching methodologies and curriculum of junior secondary education in Delta State. By exploring the strategic incorporation of ICT tools into educational practices, this research aims to assess their impact on student engagement, knowledge assimilation, and academic performance. The investigation involves an in-depth analysis of how educators in Delta State incorporate ICT resources into their teaching strategies and curriculum design, aiming to amplify the learning experiences of students. By examining successful integration methods, challenges faced, and the overall impact on student learning, this study seeks to provide valuable insights and recommendations for educators, policymakers, and stakeholders. Ultimately, the goal is to uncover effective approaches that optimize the use of ICT resources, fostering a dynamic and enriched learning environment for students in Delta State's educational landscape.

Statement of Problem

The problem statement for the integration of ICT resources into teaching methodologies and curriculum in Delta State revolves around the challenges hindering optimal utilization and integration of these resources to enhance student learning experiences. Despite the potential benefits of ICT in education, there exists a significant gap in effectively incorporating these resources into teaching methodologies and curriculum design in Delta State's junior secondary education. Challenges include inadequate infrastructure, limited teacher training in ICT integration, curriculum constraints that do not fully embrace technological advancements, and varying access to technology among students.

This disparity in access and utilization creates an uneven learning landscape, impacting student engagement, knowledge retention, and overall academic performance. Furthermore, the lack of cohesive strategies for pedagogical integration of ICT resources hampers educators' ability to harness these tools effectively, resulting in missed opportunities for enriched learning experiences. The problem statement emphasizes the urgent need to address these challenges to ensure equitable access to technology, comprehensive teacher training, curriculum adaptation, and cohesive strategies for successful integration. By addressing these issues, educators and policymakers can optimize ICT resources, fostering a more inclusive and technologically enriched learning environment for students in Delta State.

Despite widely reported positive impacts of ICT based resources in teaching and learning, there are controversies surrounding the discourse. This is because, the use of ICT based-resources in teaching and students learning outcomes I in secondary school system may not have yielded the desired effect compared to western world. Facts from scholarly assumptions showed that ICT resource-based materials for teaching and learning may be lacking in secondary schools in Nigeria. Apart from the problem of methodological approach by ICT personnel in the use of ICT resources in secondary schools, controversy as approaches to studies on the impact of ICT resource-based teaching of learning outcome varies. Hence creating need for in-depth and clearing defined researches on the subject matter. This study is set out to ascertain how ICT resources are actually used in secondary education in Nigeria, the impact of the use of ICT resources in teaching on secondary school students and how ICT usage enhances students' motivation and engagement for learning. (i) Determine the extent the use of Smartboard as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State, (ii) Ascertain the extent the use of computers as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State.

The study will be guided by the following research question**s:** to (i) what extent does the use of Smartboards as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State? (ii) what extent does the use of computers as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State? The following hypotheses were postulated and statistically tested at 0.05 level of significance ($\mathbf{H_{01}}$): There is no significant relationship between the use of Smartboard or Interactive Whiteboards as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. **($\mathbf{H_{02}}$):** There is no significant relationship between the use of computer as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

The justification for studying the pedagogical integration of ICT resources into teaching methodologies and curriculum in Delta State lies in the following reasons: Effective integration of ICT into education has the potential to significantly enhance teaching methodologies and learning experiences. Understanding the impact of these resources can improve educational practices and outcomes. In a rapidly evolving digital landscape, preparing students with technological skills is crucial for their future success. Integrating ICT into education equips them with essential skills for the modern world. Investigating the integration of ICT resources addresses disparities in access to technology among students. Understanding these disparities can guide efforts to create more equitable learning environments. Findings from this study can inform policymakers and curriculum developers in Delta State on effective strategies for integrating ICT into education, guiding future policies and curriculum revisions.

Assessing the challenges and successes of ICT integration helps identify areas where teacher training and professional development can be improved, ensuring educators are equipped to effectively utilize these resources. Understanding the impact of ICT integration can lead to the creation of enriched and dynamic learning environments that cater to diverse learning styles and needs. Overall, the study's justification lies in

its potential to transform educational practices, address technological disparities, inform policy, empower educators, and create more effective and inclusive learning experiences for students in Delta State.

The significance of studying the pedagogical integration of ICT resources into teaching methodologies and curriculum in Delta State is multifaceted. Understanding how ICT resources are integrated into teaching can vastly improve student engagement, comprehension, and retention. It can lead to innovative teaching approaches that cater to diverse learning styles, ultimately enriching students' educational experiences. Investigating ICT integration equips students with essential digital skills crucial for success in a technology-driven world. This study can empower students with the competencies needed for higher education and future employment opportunities. Assessing the integration of ICT resources sheds light on potential disparities in access to technology among students. Addressing these gaps can promote a more equitable learning environment, ensuring that all students have equal opportunities to benefit from technological advancements. Understanding successful integration strategies assists educators in utilizing ICT tools effectively. It provides insights into professional development needs, empowering teachers to optimize these resources for improved teaching outcomes. Findings from this study can inform educational policies and curriculum development, guiding decision-makers in implementing effective strategies to integrate ICT resources into education at a systemic level. The study's significance lies in its potential to transform learning experiences, bridge technological gaps, empower educators, and inform policies to create a more inclusive and technologically proficient educational system in Delta State.

Theoretical Framework

This study was anchored on Field Theory of Learning: Kurt Lewin (1930) cited in Adeyemo and Adeyemo, (2020). The Field Theory of Learning was propounded by Kurt Lewin in the 1930s. It formed one of the four factors which make up his designed method to change; others include dynamics, action research, and the three-step model of change. He originally applied the concept of learning to individual behaviour, but later uses it to examine group behaviours. For Lewin, individual behaviour was not a product of past events or future expectations, but function of the interaction between individuals and their current environment or 'field' as he termed it. He argued that to understand an individual's behaviour, it was necessary that: "One should view the present situation – the status quo – as being maintained by certain conditions or forces" (Admiraal, Huizenga, Akkerman and Dam, 2021). Lewin postulated that the field in which a person's behaviour takes place is an intricate set of symbolic interactions and forces which depend on their valence. Field psychology explains development of insight as a change in cognitive structure of life-space. 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 chapter dealt with the research procedures adopted for the study. These were discussed under the following sub-headings: Research design, population of the study, sample and sampling technique, instrument for data collection, validation of instrument, reliability of instrument, method of data collection and method of data analysis. This study adopted a correlation survey design. Correlation survey design is a type of research design that examines the relationship between two or more variables. This research design is considered good for this study as it guides the researcher to examine the relationship between ICT resource-based teaching and students learning outcomes in public secondary schools in Delta state. The population of the study consisted of seventy-five (75) teachers in the three (3) public junior secondary school s in three local government areas of Delta State (Oshimili South-Asaba, Ika South-Agbor, and Ukwani- Kwale).

The sample size of the study were 75 teachers in the purposively chosen three public junior secondary school s 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 key instrument for data collection is a self-developed questionnaire titled: ICT Based Teaching Questionnaire (ICTBTQ) and Students Learning Outcome Questionnaire (SLOQ) in Public Junior secondary school s in Delta State. The questionnaire consisted of three sections, section A solicits information on the bio-data of the respondents. While 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 be 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 the supervisor in measurement and evaluation, in the department of Educational Administration, from University o Delta, Agbor, in Affiliation with Delta State University, Abraka, Degree Programme, to assist in evaluating the instrument. The corrections, suggestions and inputs were incorporated into the final copies of the instrument. This is to ensure the critical and more professional appraisal of what the instrument is expected to measure. The reliability of the instrument was established for the entire instrument. To determine the reliability of the instrument, the test-retest method was adopted, by this method copies of the instrument will be administer to 20 respondents who were not be part of the sample study but are part of the study population. After an interval of two weeks another set of instruments will be administer on the group and the two sets of scores were correlated using Pearson product moment correlation coefficient, and the reliability index of 0.73 was obtained. The ICT Based Teaching Questionnaire (ICTBTQ) and Students Learning Outcome Questionnaire (TLOQ) was administered by the researcher to the respondents. The completed copies of the questionnaire were collected from the respondents immediately. The researcher ensured that all the copies of the questionnaire given out were completed and returned. In analyzing the data for the study, mean and standard deviation statistics will be used to answer the research questions while linear regression analysis will be 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 analysed.

Results

This chapter shows detailed Presentation of data, Analysis of Data, Summary of data, and discussion of findings. The chapter employed both descriptive and inferential statistics in the analysis and test of hypotheses using SPSS version 23.0.

Table 1: Questionnaire distribution and retrieval

No. of copies of questionnaire issued	No. of copies of questionnaire retrieved	Useful copies of Questionnaire received	Non-useful copies of Questionnaire received
75.00 (100%)	75.00 (100%)	75.00 (100%)	0.00(0%)

SPSS Output 2023

The table above shows the questionnaire distribution and retrieval. The researcher issued 75.00 (100%) questionnaires and in the end, retrieved 75.00 (100%), which represents 100% response rate and this is considered significant for the study.

Bio-Demography Data

The table below 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.

Table 2: Bio-demography data

Gender		Frequency	Percent
	male	36	48.0
	female	39	52.0

	Total	**75**	**100.0**
AGE	20-25 years	5	6.7
	26-30 years	14	18.7
	31-35years	37	49.3
	40 and above	19	25.3
	Total	**75**	**100.0**
QUALIFICATION	NCE	5	6.7
	B.Ed	43	57.3
	M.Ed	24	32.0
	PhD	3	4.0
	Total	**75**	**100.0**

SPSS Output 2023

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 Question 1. Access to what extent does the use of smartboards as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State?

The table 3 revealed the percentage responses for The advent of smart board in the school has enhanced students learning outcome to be 68 (90.7%) for very high extent and 7 (9.3%) for high extent; Teachers' ineffectiveness in the use of smart board affects students learning outcome was found to be 40 (53.3%) for very high extent, 35 (46.7%) for high extent; Teachers lack of efficient skills in the use of smart board reduces students learning outcome was 68 (90.7%) for very high extent; 7 (9.3%) for high extent; Smart board facilities are not adequately available in the school and its affecting students learning outcome was 39 (52.0%) for very high extent and 36 (48.0%) for high extent while The teacher's ability to engage learners in the use of smart board enhances students learning outcome was 68 (90.7%) and 7 (9.3%) for very high extent and high extent respectively. The respondents agreed that the use of smart boards as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State.

Table 3: Likert Scale for the use of smart boards as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State

S/NO	ITEM	VHE	HE	LE	VLE
16	The advent of smart board in the school has enhanced students learning outcome	68 (90.7%)	7 (9.3%)	0 (0.0%)	0 (0.0%)
17	Teachers' ineffectiveness in the use of smart board affects students learning outcome	40 (53.3%)	35 (46.7%)	0 (0.0%)	0 (0.0%)
18	Teachers lack of efficient skills in the use of smart board reduces students learning outcome	68 (90.7%)	7 (9.3%)	0 (0.0%)	0 (0.0%)
19	Smart board facilities are not adequately available in the school and its affecting students learning outcome	39 (52.0%)	36 (48.0%)	0 (0.0%)	0 (0.0%)
20	The teacher's ability to engage learners in the use of smart board enhances students learning outcome	68 (90.7%)	7 (9.3%)	0 (0.0%)	0 (0.0%)

SPSS Output 2022

Research Question 2. To what extent does the use of computers as ICT resource-based impact teaching students' learning outcome in public junior secondary school s in Delta State?

The table 4 below revealed the responses to Access to what extent the use of computers as ICT resource-based teaching students' has on learning outcome in public junior secondary schools in Delta State? The result revealed that the adequacy of computer facilities in the school increases students' performance was 68 (90.7%) to very high extent, 7 (9.3%) high extent; the utilization of computer facilities to access information in school enhances students learning outcome was 37 (49.3%) Very high extent, 38 (50.7%) high

extent and The ability for student to use computer facilities to modify their works enhances students learning outcome was found to be 67 (89.3%) very high extent, 16 (21.3%) high extent while Students learning outcome are determined with the ability for students to effectively utilize computer facilities was 7 (9.3%) very high extent, 16 (21.30) high extent and 52 (69.3%) low extent. Also, the use of computer offers opportunities for carrying out group-based learning was 67 (89.3%) very high extent, and 8 (10.7%) high extent respectively. The respondents agreed that the use of computers as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State. The respondents agreed that the use of computers as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State.

Table 4: Linkert Scale for the use of computers as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State

S/NO	ITEM	VHE	HE	LE	VLE
21	The adequacy of computer facilities in the school increases students' performance	68 (90.7%)	7 (9.3%)	0 (0.0%)	0 (0.0%)
22	The utilization of computer facilities to access information in school enhances students learning outcome	37 (49.3%)	38 (50.7%)	0 (0.0%)	0 (0.0%)
23	The ability for student to use computer facilities to modify their works enhances students learning outcome	67 (89.3%)	8 (10.7%)	0 (0.0%)	0 (0.0%)
24	Students learning outcome are determined with the ability for students to effectively utilize computer facilities	7 (9.3%)	16 (21.30	52 (69.3%)	0 (0.0%)
25	The use of computer offers opportunities for carrying out group-based learning activities which enhances students leaning outcome	67 (89.3%)	8 (10.7%)	0 (0.0%)	0 (0.0%)

SPSS Output 2022

Testing of Hypotheses

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.

H01: There is no significant relationship between the use of Smartboard or Interactive Whiteboards as an 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 Smartboard or Interactive Whiteboards as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State, where (correlation value r = .009, $p < 0.05$). The implication of this result is that the respondents agreed that the use of Smartboard or Interactive Whiteboards as an ICT resource-based teaching does affect students' learning outcome in public junior secondary school s in Delta State. Thus, the hypothesis was rejected.

Table 5: Regression Analysis Coefficientsa the relationship between the use of Smartboard or Interactive Whiteboards as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	**Std. Error**	**Beta**		
1	**(Constant)**	0.473	1.460		3.653	.009
	Vas	0.347	0.686	0.876	1.432	.002

a. Dependent Variable: ELP

H02: There is no significant relationship between the use of computer as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

Table 6: Analysis of Variance the relationship between the use of computer as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6343.735	1	6343.735	44.6	0.001[b]
	Residual	200.64	198	25.379		
	Total	6542.723	199			

a. Dependent Variable : ELP
b. Predictors: (Constant), VAs

The results from the table of analysis for hypothesis three shows that there is a significant relationship between the use of computer as an ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State, where (correlation value r = .001, $p < 0.05$). The implication of this result is that the respondents agreed that the use of computer as an ICT resource-based teaching does affect students' learning outcome in public junior secondary school s in Delta State. Thus, the hypothesis was rejected.

Discussion

The use of smartboard as ICT resource-based teaching and students' learning outcome

Hypotheses four of the study states that there is no significant relationship between the use of smartboard as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. The hypothesis was rejected because the use of smartboard 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; Schuck and Kearney (2007). Observed that the advent of smart board innovation in the teaching and learning in secondary schools assumes a significant job in making the entire class showing increasingly compelling, beneficial, and imaginative understanding. In addition, smart boards additionally empower the teachers to design their exercises more adequately and easy to understand by the students and less time consuming. Educators can likewise lead exercises in an increasingly sorted out and arranged way, just as encouraging intelligent works on utilizing smart boards. Beeland (2002) the use of smartboard in teaching strengthens learning by upgrading inspiration, understudy commitment and dynamic investment to exercises, hands-on applications, collaboration, consideration, and mulling over individual contrasts. On the hand, considers have indicated that keen sheets upgrade both secondary school students and their teachers to direct various exercises while instructing and students learning outcome. Here are some of such activities. Smart Board encourages the job of teachers in making solid compatibility with students learning outcome. It permits the teacher to explore from the board, he/she doesn't need to go to his PC, turn his back to the class, and be more centred around the innovation than on the learning procedure of the student's learning outcome. This point is significant when utilizing smart board to teach and is vital in bridging language barrier in the classroom.

The use of computer as ICT resource-based teaching and students' learning outcome

Hypotheses five of the study states that there is no significant relationship between the use of computer as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State. The hypothesis was rejected because the use of computer 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; Aduwa-Ogiegbaen and Iyamu (2005) who noted that computers provide more productive and innovative teaching and learning which enhances the intellectual and creative potentials of the students in today's information society. Therefore, computer has been integrated in teaching faster than the previous audio-visual technologies (Balasubramanian et al., 2009). Computers and Internet offer excellent and plenty opportunities to the students through the use of text, graphics, multicolour images, motion, and audio for the development of their creative talents and high-quality learning. Balasubramanian et al. (2009) adds that

computers offer excellent and verity opportunities to the students through the use of text, graphics, multicolour images, motion, and audio for the development of their creative talents and high-quality learning. Computer offers more learner centred instruction, independent investigation, personalized activities, and teamwork computer has been integrated in teaching faster than the previous audio-visual technologies. Study from Nigeria showed that the lack of ICT resources and poor infrastructure prevent the full implementation of computer-based teaching in Nigeria education sector (Adeosun, 2010).

Summary of findings

Research question one was raised to investigate the effect of the use of computers as ICT resource-based teaching students' learning outcome in public junior secondary school s in Delta State. From our findings, the respondents agreed that there is a significant effect on learning outcome when computers as ICT resource-based teaching are used in teaching and learning. Research question two was raised to investigate the effect of the use of projector as ICT resource-based teaching influence students' learning outcome in public junior secondary school s in Delta State. From our findings, the respondents agreed that there is a significant effect on learning outcome when computers 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 smartboard 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 computer as ICT resource-based teaching and students' learning outcome in public junior secondary school s in Delta State.

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

Teachers and student should stop using permanent or rewritable marker on the smartboard, in other word, there should be proper coaching on the use of the smartboards in public junior secondary school s in Delta State.

Delta State government and their funding counterpart should provide more computer operators in public junior secondary school s in Delta State.

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