

INCORPORATION OF VISUAL INSTRUCTIONAL TECHNOLOGY FOR ENHANCED QUALITY TEACHING AMONG LECTURERS IN HIGHER EDUCATION, CROSS RIVER STATE, NIGERIA. IMPLICATION FOR CLASSROOM MANAGEMENT, ASSESSMENT AND EVALUATION

By

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Abstract

The study examined the incorporation of visual instructional technology for enhanced quality teaching among lecturers in Higher Education, in Cross River State, Nigeria. Implication for classroom management, assessment and evaluation. The research design adopted for this study was descriptive survey research. The study used a population of 206 lecturers (academic staff) in some tertiary institutions in Cross River State. The stratified sampling technique was adopted for this study. Due to the small nature of the accessible population, the census was used for the study. Thus, the 206 lectures (academic staff) of tertiary institutions were used for the study. The instrument was subjected to content validity by three experts two in Measurement and Evaluation and one in Educational Management in the Faculty of Educational Foundation Studies, University of Calabar and UNICROSS respectively. The reliability of the instrument was established using Cronbach's alpha reliability method. The data was analyzed with descriptive and inferential statistical analysis. Descriptive statistics was used to answer the research questions (mean and standard deviation). Inferential statistics was used to test the stated hypotheses using Simple and Multiple Linear Regression analysis. The finding revealed that interactive whiteboards, projectors and flip charts do significantly predict quality teaching. There is a composite and relative effect of interactive whiteboards, projectors and flip charts on quality teaching. In conclusion, utilizing visual instructional strategies can foster quality teachers on the part of the teachers and learning on the other part of the students. It was recommended among others that schools should encourage the use of interactive whiteboards for enhanced quality teaching.

Keywords: Visual, Instructional Technology Quality, Classroom Management, Assessment and Evaluation.

INTRODUCTION

Education is a vital tool that enhances societal growth and fosters the national development of a nation. It promotes individual skills and is key to expanding information and communication with the outside world. Little wonder, Nations like China, Germany, Finland, and the United States of America cannot be compared in terms of their quality education due to their inculcation of high visual instructional skills in communication technology. Management of education activities cannot be succinctly achieved if teachers do not adopt the necessary visual and technological facilities. It is obvious that teachers require a variety of strategies in most cases, traditional classroom instruction strategies rely heavily on rote memorization which cannot be effectively carried out today due to the availability of a wide range of educational technology, and instructional approaches to better engage



their classrooms and connect with students. A very efficient and useful approach is visual teaching (or visual learning). As the name suggests, visual teaching relies on visually presenting information to help students grasp new concepts, connect ideas, and practice critical thinking. In the words of Egbeji (2020) education is yet to be placed on a smooth path in Nigeria due to a number of impediments underfunding is one. Yet, education has widely been considered as the foundation upon which development in any society is premised. Nations that thrive in technology invest in education as a tool for the development of skills which can be used to produce wealth and h; create and sustain a suitable society only if visual learning is considered a s a vital tool.

One outstanding benefit of visual instructional delivery helps students engage with and retain information, visualize complex or abstract ideas swiftly, foster student engagement by improving their classroom attention and promote information retention by coordinating and organizing information more effectively. In fact, the brain processes visuals 60,000 times faster than text, and visuals can help students improve learning by up to 400%. With this in mind, educators should take advantage of visuals to enhance their instruction and increase the quality and engagement of their curriculum (<https://lucidspark.com/blog/visual-teaching-strategies-to-improve-learning>). This can include video presentations, graphic organizers, diagrams, concept maps, and interactive visual learning through collaboration and imagination. Teachers can use visuals to share information effectively thus, learning by teaching is a proven method for successful education. It facilitates students to demonstrate what they have learned by sharing and presenting the information visually through PowerPoint slides, diagrams, graphs, concept maps or annotated visuals. Presenting data and ideas visually can not only help students better retain the information but also demonstrate their understanding of complex topics as they organize concepts into clear visuals.

Research studies have also shown that most African countries struggling with poor quality of education are those with less technological ability in terms of visual instructional technological advancement. In the academic sphere, poor utilization of visual technological facilities has affected the quality of research outputs which has further diminished the academic standing of research undertakings in Nigeria. To this end, Eyong (2023) posits that every university teacher in the academic environment has three core services expected viz; teaching, researching, and community services. Especially in the research sphere where “publish or perish” has become the centre for academic excellence and growth on the job. These activities centre on quality in research output. Poor quality in research undertakings in most university institutions in Nigeria may be a result of limited academic staff with experience in carrying out research. Research is one major indicator used for ranking higher institutions’ performance. To execute quality research, there is a great need for lecturers’ availability with a high level of experience. Unfortunately, many higher institutions in the country do not have these qualified researchers and professors due to brain drain problems.

Iyishu, Eyong, and Effiom, (2020) study sought to examine the availability and utilization of information and communication technology in data analysis: The university experience. For the study, two objectives and research questions were posited to guide the study and the study adopted the descriptive survey design of the ex-post facto type and the population comprised 3, 217 respondents drawn from two universities (the University of Calabar and Cross River University of Technology) and a sample of 322 respondents which depict 10% of the population. For ease of data collection, a structured questionnaire titled Availability and Utilization of Information and Communication Technology and Data Analysis Questionnaire (AUICTDAQ). The instrument was subject to expert

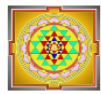


corrections in the field of Educational measurement and evaluation and library and information sciences respectively and the inputs, corrections and modification of the instrument were done before data collection. The instrument was trial tested using split-half reliability and the coefficient of internal consistency ranged from .87 to .93 accordingly indicating that the instrument was valid and reliable for data collection. The statistical analysis used for data analysis are the simple percentage and bar charts. From the data analysis, it was found that for the availability of ICT facilities in data analysis, the majority of the respondents 312 (98.42%), 310 (97.79 %) and 274 85.80% agreed that Statistical Analysis Software (SAS), Microsoft Excel and Statistical package for social sciences are available to them when analyzing data however, 309 (97.48%), 305, 96.21 and 269 84.86% dominated the study Python, R and Tableau ICT facilities are not available to the in data analysis. Also, the finding of how are ICT facilities utilised in data analysis among graduate students as shown in Table 2. 305 (96.21), 297 (93.69%) and 293 (92.43%) strongly said that they utilized Microsoft Excel, Statistical Analysis Software (SAS) and Statistical Package for Social Sciences in data analysis while 309 (97.48%), 298 (94.01%) and 275 (86.75%) said that they do not utilised R, Tableau and Python ICT software in data analysis. It was concluded that as university teachers, the availability and utilization of information and communication technology can foster teachers'/students' quest for knowledge advancement in all ramifications there is a need for skilful practices in data analysis which can maximally be achieved through quality ICT skills. It was however recommended that the government should provide ICT facilities (software) to all tertiary institutions at affordable prices for students to be well equipped with the training skills rudiment for enhanced skills in data analysis.

According to Shavinina (2001), teaching with the chalkboard, textbooks etc. have been used for educational purposes over the years, but none has quite impacted the educational process computer, and internet (visual instructions) technology have the power to provide users with greater interaction potentials in order to enhance their intellectual and creative ability. It has also been discovered that utilizing instructional visual aids can be helpful in classroom settings by encouraging inquiry, helping communication, constructing materials and assisting learners “self-expression and boosting learners’ enthusiasm to learn, their performance and their degree of knowledge retention, as well as their active participation in classroom lessons”.

Inculcation of visual instructional aids in teaching provides various ways and strategies to make easy and comfortable the teaching and learning process because it constitutes tangible content so even the learners can easily understand and be connected to the subject. Because of the many advantages utilization of instructional aids brings, most educators find systematic ways of understanding individual differences of students taught with instructional materials in the whole teaching process. Onyidikachi (2011) as cited in the study of Oden states effective teaching without utilizing instructional visuals and is sometimes impossible to attain the teaching, learning goals and development of positive interesting attitudes on the part of the learner. Students' attitude reflects their self-confidence enjoyment, motivation etc. A negative attitude affects a student's motivation to persevere during learning. The use of instructional visual aids in school, home instructor attitudes and views, teaching technique, parental attitudes, parents' education and students' impressions of the school are all elements that influence students'/learners' attitude toward learning.

Abdullah, Ziden and Aman (2015) carried out a study on student's attitudes towards information technology and its relationship with their academic achievement through a self-developed questionnaire. The attitudes of respondents were assessed in terms of three dimensions, namely:



affection, behaviour and belief. The results revealed a statistically significant difference between arts and science students in terms of their attitude towards IT in favour of science students and also proved that there was no statistically significant correlation between students' academic achievement and their attitudes towards IT. Students at a medium level of academic achievement tended to score higher on the affection toward IT compared with students at a satisfactory level of academic achievement.

Mazana, Montero and Casimir (2016) investigated students' attitudes towards learning matters in Tanzania. It sought to ascertain reasons for liking or disliking mathematics and the relationship between attitude and performance. ABC model and Walberg's theory of productivity to investigate students' attitude towards mathematics and associated factors. The quantitative and qualitative data were collected from 419 primary school students, 318 secondary school students and 132 college students from 17 schools and 6 colleges in mainland Tanzania using a survey. The collected were analyzed using percentages means, standard deviations, ANOVA, correlation, regression and thematic analysis. The results show that initially students exhibit a positive attitude towards mathematics, but their attitude becomes less positive as the students move forward to higher levels of education. A significant positive weak correlation between students' attitude and performance was established. Mathematics enjoyment and attitude significantly predicted students' performance in our data. The factors influencing the students' liking or disliking of mathematics constituted students' aptitude attribute, instructional and social psychological environmental factors. Furthermore, the results show that failure in examinations is attributed to teacher didactic strategies institutional resources, poor learning and examination strategies and failure to understand instructions.

Yusuf and Ajayi (2009) conducted a study to examine the relationship between instructional space planning and students' academic performance in southwest Nigeria secondary schools. A survey research design was adopted for the study. The sample consisted of 1650 respondents comprising 150 school principals and 1500 students. Multistage, stratified and simple random sampling techniques were used to select the sample. Data collected were analyzed using frequency counts, percentages, means and Pearson Product-Moment correlation coefficient. The five null hypotheses formulated were tested at 0.05 level of significance. The study revealed that the level of instructional space planning and students' academic performance were relatively high during the period under study. The study also revealed that students' academic performance was significantly related to instructional space planning, classroom planning, library planning and technical workshop planning. It was however revealed that there was no significant relationship between laboratory planning and students' academic performance.

Sosiawan, Marhaeni & Dewi (2019) investigated the effect of contextual comic strips on eighth-grade students' reading comprehension. The posttest-only control group design was applied. The population in the study was all of the students at SMP Negeri 6 Singaraja in the academic year 2018/2019. The sample of the study was 60 students consisting of 30 students from the viii B1 class as the experimental group and 30 students from viii B2 as the control group. The sampling technique adopted for the study was the cluster sampling technique. The data were collected through a posttest in the form of multiple-choice test. The data were analyzed by using a t-test in SPSS 16.0 program. The result of the study revealed that the mean score for the experimental group (73.17) is higher than the control group (69.00). The result of the t-test also revealed that the sig (2-tailed) was 0.025 since the value of sig (2-tailed) was below 0.05 the null hypotheses was rejected and the alternative hypotheses was accepted. Based on the result, it was concluded that there was a significant effect of contextual



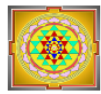
comic strips on eighth-grade students' reading comprehension at SMP Negeri 6 Singaraja in 2018/2019 academic year.

Chandra, Das and Samanta (2012) conducted a study on students' attitudes towards the use of different types of audio-visual techniques for biochemistry. A total of 200 undergraduate medical students participated in this questionnaire-based study. Out of 200 students, 115 (57.5%) were male and 85 (42.5%) were female. During the study, it was found that 60% of the students preferred PowerPoint in combination with blackboard teaching and only 20% of the students preferred PowerPoint presentation. Then 15% of students favoured the traditional blackboard teachings rather than projector or PowerPoint class. About (5%) of students opted for the overhead projector. It was concluded that undergraduate medical students preferred a combination of PowerPoint presentation along with blackboard teaching for biochemistry meaning that it helped them both in visual and auditory senses to absorb information.

Jibril (2021) conducted a study to compare the attitude of Dire Dawa University lecturers attitudes towards using projectors. The sample for the study consisted of 120 lecturers (social science male – 30, female – 30) (Natural science male – 30, female – 30). A random sampling strategy was adopted to draw a sample for the study. The data were subjected to various statistical treatments. The results revealed that the male Dawa University and natural science lecturers have a favourable attitude towards using slide projectors in Ethiopia. Amin, Azim, Kalam & Salam (2018) carried out a study on the benefit of using multimedia projectors in English language teaching classrooms. In this era of modern science and technology, the latest portion has been added to language teaching. With the progress of technology, new innovations are being brought up in language teaching. At present language teachers are using multimedia projectors to facilitate the teaching process. The purpose of this study is to investigate the benefits the language teachers as well as the learners get in using multimedia projectors in teaching English language. A qualitative process was followed for data collection in this research, it was found that the use of a multimedia projector supports both the teacher and the students in learning language skills. The research findings also showed that using the relevant audio-visual substance helps the teachers to overcome during teachers' orientation classes.

Pun (2013) investigated how the teachers and students of English language have benefitted by using multimedia projectors in the classroom, he highlighted that the quick expansion of modern technology like multimedia which refers to computer-based applications, allows teachers and students to share their views and ideas. It is a combination of text, graphics, animation, video and sounds. The utilization of multimedia technology has created a favourable situation in improving the attractiveness of teaching and learning. Similarly, Salehi & John (2013) used multimedia projectors as visuals to draw more attention among the students during reading. Various visual aids like images and videos help the students to understand the conceptual prospect of the text. Moreover, visual aids create a real relationship between the readers and the text. According to them, it makes the reading process quicker and lively, most readers think more attached to the text through a multimedia projector. Also, Halwani (2017) investigated how reading and writing would be developed when teachers help the students by using multimedia projectors as audio-visuals and students' shyness will be removed for showing the visuals, students will read and write smoothly and spontaneously.

Oladina (2010) examined the effect of flip chart. Instruction on the academic performance of junior secondary school students who were taught social studies without relevant instructional materials



in Ogun State. Two research hypotheses were formulated, Quasi-experimental research design involving pre-test and post-test was adopted. The research instrument used was a social studies performance test and was validated by the supervisor and other experts, the instrument was tested and the obtained reliability was high. The data were analyzed using mean, standard deviation and t-test statistics. The result indicated a significant difference between the academic performance of control and experimental groups. In favour of the experimental group which shows the effect of flip chart instruction in instructional delivery of social studies.

In a related study by Abd, Muniri Sibilana (2020) conducted a study on improving students' learning achievements using a flip chart medium design based on the cooperative learning method. Two research questions were raised and two research hypotheses were formulated, the population of the study was 12 elementary school institutions in Rejotangan, Thlungagung sub-districts by setting 4 schools as samples which were divided into 2 schools as experimental classes (flip chart learning design) and 2 schools as control classes (conventional learning). The sample selection was done using sample random sampling techniques carried out descriptively and inferentially. The results of the study indicated that the flip chart learning medium is based on a cooperative learning method and can be said to be quite effective in improving students' learning outcomes. This is evidenced by using the N-Gain score test with a significance level of 62% while conventional media is not effectively applied to thematic subjects with a percentage of 8%. Mann-Whitney test further showed that the significance score was 0.00. Therefore, it can be seen that there is a positive influence of the use of a flip chart learning medium on learning outcomes in thematic subjects of grade 2 elementary school in the Tuhungagung sub-district.

Similarly, Aryani (2018) carried out a study to answer the question of whether or not using a flip chart can affect vocabulary learning outcomes in the 8th-grade students of SMP Negeri 1 Tarub Tegal Regacy. Quasi-experimental research design and quantitative approach. The population was eighth-grade students of SMP Negeri 1 Tarub, in the academic year 2020-2021. The sample was selected by using a simple random sampling technique which consisted of 32 students of Viii-G as a control class and 32 students of Viii-1 as an experimental class. To collect data, pre-test and post-test with multiple choice was used. The result of the paired sample t-test showed there was a significant difference in vocabulary learning outcomes before and after the treatment in the experiment. It showed that the mean of the pre-test was 62.38 while the mean of the post-test was 86.13. The results of the independent sample t-test showed there was an improvement in vocabulary learning outcomes of the students who were taught through a flip chart. It showed by percentage of pre-test and post-test in the experimental class from 37.5% to 93.8%.

Thus the need for visual instructional technology in teaching hence, on the basis of this problem that the study sought to examine the incorporation of visual instructional technology for enhanced quality teaching among lecturers in higher Education, Cross River State, Nigeria. Implication for classroom management, assessment and evaluation

The theoretical model of visual instructional delivery Using Bloom's taxonomy, graphics and narration and behaviourism learning theory



Figure 1: Eyong’s model (staircase) depicting the level of cognitive domain from simple to complex in line with visual instructional delivery

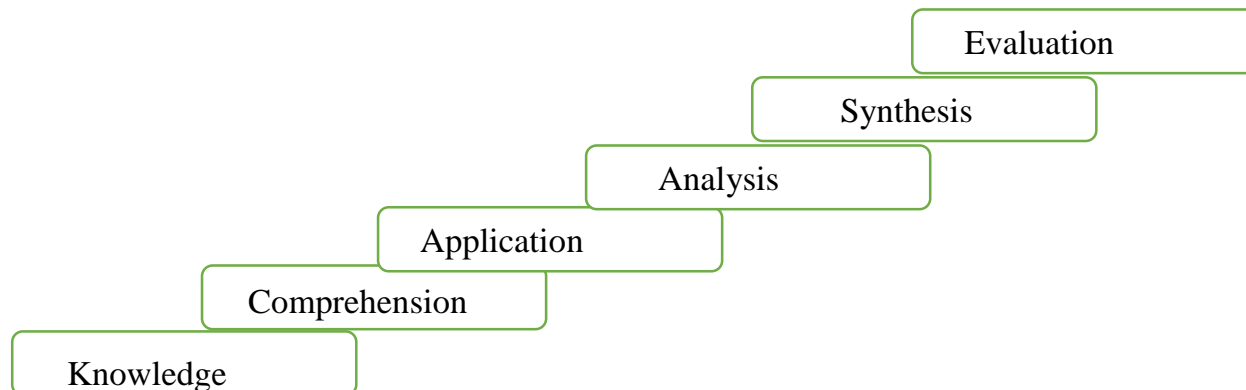


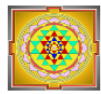
Table 8: Summary of the cognitive domain as presented by Benjamine Blooms (1957)

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Student remembers or recognizes information or specifics as communicated with little personal assimilation.	Student grasps the meaning behind the information and interprets, translates, or comprehends the information.	Student uses information to relate and apply it to a new situation with minimal instructor input.	Student discriminates, organizes, and scrutinizes assumptions in an attempt to identify evidence for a conclusion.	Student creatively applies knowledge and analysis to integrate concepts or construct an overall theory.	Student judges or evaluates information based upon standards and criteria, values and opinions.

Sources: Blooms (1957)

Using this model/stair case developed as classroom instructors/teachers, a good instructional deliver ought to start with a clear understanding of the requirement and the learner's profile. With this, the teachers can come up with apt problem-based scenarios that address the learners' need to see the application of the content. Thus, Bloom’s taxonomy to identify the level of learning helps with deciding the instructional strategies and the depth of content that needs to be followed. Bloom’s taxonomy also helps us categorize the training across cognitive, affective, and psychomotor domains.

In the context of the classroom, graphics and narration tend to help learners retain 50% of the content seen and inferred as opposed to only 10% of what they read. Visual instructional strategies serve the basic purpose of attracting learners' attention, and then they later facilitate the retention of newly acquired knowledge. Even the smallest of graphics, such as icons, act as visual cues and help the learners recall the required information. In his multimedia principle. Mayer (2015) posits that people



learn better from words and pictures than from words alone. At the same time, as per his coherence principle, people learn better when extraneous words, pictures, and sounds are excluded rather than included. Hence, we have to keep a watch on the usage of visual instructional strategies

Using the behaviourism learning theory, in this study is relevant because learners prefer consistent structures and patterns. Humans can be conditioned to learn new information through conditioning. When developing learning content, this human aspect is considered by structuring the content using consistent styles for page titles, using standard templates, and so on. As per Mayer's segmenting principle, people learn better when a multimedia lesson is presented using user-paced segments rather than as a continuous unit.

Statement of the problem

The problem of utilizing quality instructional strategies in teaching has been a long debate among stakeholders in the academic environment. This is a result of non-utilization of the instructional visual aids available to be used by teachers in their teaching and instructional delivery. It has been observed that many teachers seldom make use of charts and graphs in explaining some basic concepts during the teaching and learning exercise. In like manner, most teachers do not possess the skills needed to explain charts, diagrams, and textbook illustrations to the learners' understanding while the use of television in teaching some subjects is a rare opportunity because most schools lack the facility to enable it. Meanwhile, the utilization of instructional visual aids during lessons helps to boost learners' interest and makes them active participants in the classroom rather than passive learners. In spite of government efforts to equip most tertiary institutions with quality books, and laboratories and provide resource rooms for improved visual technologies. There still lingers poor teaching and learning. It is on the basis of this problem that the study sought to carry out a study on the need for inculcating visual instructional technology for quality teaching among lecturers of higher education in Cross River State, Nigeria. Implication for classroom management, assessment and evaluation. Hence, the trust for this research study

Purpose of the study

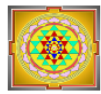
The main purpose of this study was to examine how the inculcation of visual instructional technology can enhance quality teaching among lecturers of higher education in Cross River State, Nigeria. Implication for classroom management, assessment and evaluation. Specifically, the study seeks to:

1. Ascertain how interactive whiteboards predict quality teaching.
2. Find out how the use of projectors and predict quality teaching.
3. Determine flip charts predict quality teaching.
4. Assess the composite and relative effect of interactive whiteboards, projectors and flip charts on quality teaching.

Research questions

The following research questions were answered in this study

1. To what extent do interactive whiteboards predict quality teaching?
2. To what extent does the use of projectors and predict quality teaching?



3. How do flip charts predict quality teaching?
4. What are the composite and relative effects of interactive whiteboards, projectors and flip charts on quality teaching

Statement of hypotheses

The following null hypotheses were formulated to guide this study

1. Interactive whiteboards do not significantly predict quality teaching.
2. The use of projectors does not significantly predict quality teaching.
3. Flip charts do not significantly predict quality teaching.
4. There are no significant composite and relative effects of interactive whiteboards, projectors and flip charts on quality teaching.

RESEARCH METHODS AND PROCEDURE

The methodology adopted in the study and the procedure for data analysis are presented in this section which are outlined under the following sub-headings: Research design, population of the study, sampling technique, sample, instrumentation, validity of the instrument, reliability of the instrument and procedure for data analysis

Research design

The research design that was adopted for this study was descriptive survey research. Descriptive survey design is a method for collecting information or data as reported by individual research participants. Kothari (2005: 132) defined survey “as any procedure in which data are systematically collected from a population or a sample thereof through some form of direct solicitation, such as face-to-face interviews, telephone interviews or mail questionnaires”.

Population of the study

The population of this study comprised 206 staff in some tertiary institutions in Cross River State. It includes three (3) Vice Chancellors, three (3) Provost, one (1) Rector, ninety-one (91) Deans of Faculty/schools and two hundred and eighteen (108) Head of Departments in all the tertiary institutions in Cross River State, Nigeria. Source: Office of the Registry of Universities and College of Education/Health Technology in Cross River State March-, 2023

Sampling procedure

A stratified sampling technique was adopted for this study. The stratified sampling technique became appropriate because of the different strata of tertiary institutions in Cross River State. The first stage was to stratify tertiary institutions on the basis of institutional type (University of Calabar; Cross River University of Technology; Federal College of Education, Obudu; College of Education, Akamkpa, College of Health Technology, Calabar, and Institute of Technology and Management (ITM, Ugep). The second stage was to select the required faculties and departments that constituted the study sample. The third stage was to adopt purposive sampling in selecting the required respondent for the study. The choice of adopting purposive sampling was on the basis that the researcher was creditably and intentionally included in the sample elements/subjects which are judged to possess the characteristics of the population being investigated. This means that when a researcher draws a sample because of special considerations like the ease of data collection or the element being judged as typical, of the population, such a researcher is free to utilize a purposive sampling technique.

Sample

Since the accessible population was not large the census was used for the study. Thus the 206 lecturers of tertiary institutions were used for the study.



Instrumentation

The instrument used for this study was a researchers-developed questionnaire entitled Visual Instructional Technology and Enhance Quality Teaching Questionnaire (VITEQTQ). The instrument is made up of three sections A, B and C. Section A: Captures demographic data of the respondents. Section B and C of the (VITEQTQ) elicits information from the respondents on the sub-independent variables of the study which include, interactive whiteboard, projector and flip charts. Each of these variables has 6 items totaling 18 items. Section C elicited information on Enhanced Quality Teaching Questionnaire which has 30 items.

Validity of the instrument

To ensure that the instrument measures what it purports to measure, it was subjected to content validity by three experts two in Measurement and Evaluation and one in Educational Management in the Faculty of Educational Foundation Studies, University of Calabar and UNICROSS respectively. The experts took time to critically ascertain whether the instrument exhaustively covered all it purports to measure. The experts also helped to determine whether the items were properly worded and where appropriate amendments were necessary. After all necessary suggestions, and modifications made by these experts, the researcher adapted all the necessary corrections adequately. Through this process, some items were dropped, and modified and some changes were effected before the final administration.

Reliability of the instrument

The reliability of the instrument was established using Cronbach's alpha reliability method. The instrument was administered to 40 administrative staff in the population who were not part of the sampled department used in the final study. After administering the questionnaire, the retrieved copies were coded and the coefficient of internal consistency was calculated with Statistical Package for Social Sciences (SPSS Version 20) and the reliability ranged from .70 to .91 which signifies a high level of consistency of the instrument.

Procedure for data analysis

The data was analyzed with descriptive and inferential statistical analysis. Descriptive statistics was used to answer the research questions (mean and standard deviation). Inferential statistics was used to test the stated hypotheses using Simple and Multiple Linear Regression analysis.

Presentation and interpretation of results

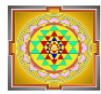
Simple linear regression analysis was carried out in testing the six hypotheses. All decisions were taken at a .05 level of significance such that a null hypothesis was rejected if the p-value associated with the computed test statistic was less than .05 and retained if the p-value was greater than or equal to .05.

Hypothesis One

Interactive whiteboards do not significantly predict quality teaching. Simple linear regression was applied in testing this hypothesis with Interactive whiteboards as the predicted variable and quality teaching as the dependent variable. The results are presented in Table 1.

Table 1
Simple linear regression analysis of quality teaching
on Interactive whiteboards.

R	R Square	Adjusted R Square	Std. Error of the Estimate
.156 ^a	.024	.019	5.30379



Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value
Regression	139.601	1	139.601	4.963	.027 ^b
Residual	5597.902	199	28.130		
Total	5737.502	200			
Variables	B	Std. Error	Beta	t-value	p-value
(Constant)	37.597	1.679		22.392	.000
Interactive whiteboards	-.254	.114	-.156	-2.228	.027

*p<.05

From Table 1, the p-value (.156) associated with the computed F-value (4.963) is greater than the chosen levels of significance (.05). Thus, the null hypothesis was not rejected. This means that Interactive whiteboards do not significantly predict quality teaching. The regression constant, however, contributed significantly to the prediction of institutional growth, while the coefficient not (p>.05)

Hypothesis two

The use of projectors does not significantly predict quality teaching. Simple linear regression was applied in testing this hypothesis with the use of projectors as the predicted variable and quality teaching as the dependent variable. The results are presented in Table 2.

Table 2
Simple linear regression analysis of quality teaching on the use of projectors.

R	R Square	Adjusted R Square	Std. Error of the Estimate		
.170 ^a	.029	.024	5.30101		
Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value
Regression	164.819	1	164.819	5.865	.016 ^b
Residual	5563.936	198	28.101		
Total	5728.755	199			
Variables	B	Std. Error	Beta	t-value	p-value
(Constant)	30.933	1.307		23.666	.000
Interactive whiteboards	.203	.084	.170	2.422	.016

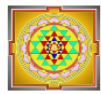
*p<.05

From Table 2, the p-value (.170) associated with the computed F-value (5.865) is greater than the chosen levels of significance (.05). Thus, the null hypothesis was not rejected. This means that the use of projectors does not significantly predict quality teaching. The regression constant, however, contributed significantly to the prediction of institutional growth, while the coefficient not (p>.05).

Hypothesis three

Flip charts do not significantly predict quality teaching. Simple linear regression was applied in testing this hypothesis with the use of projectors as the predicted variable and quality teaching as the dependent variable. The results are presented in Table 3.

Table 3



Simple linear regression analysis of quality teaching on Flip charts.

R	R Square	Adjusted R Square		Std. Error of the Estimate		
.147 ^a	.022	.017		5.31090		
Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value	
Regression	124.575	1	124.575	4.417	.037 ^b	
Residual	5612.927	199	28.206			
Total	5728.755	199				
Variables	B	Std. Error	Beta	t-value	p-value	
(Constant)	37.602	1.778		21.152	.000	
Flip charts	-.192	.092	-.147	-2.102	.037	

*p<.05

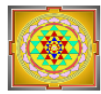
From Table 3, the p-value (.147) associated with the computed F-value (4.417) is greater than the chosen levels of significance (.05). Thus, the null hypothesis was not rejected. This means that the Flip charts do not significantly predict quality teaching. The regression constant, however, contributed significantly to the prediction of institutional growth, while the coefficient not (p>.05

Hypothesis four

There are no significant composite and relative effects of interactive whiteboards, projectors and flip charts on quality teaching. To test this hypothesis, Multiple Linear Regression analysis was executed with interactive whiteboards, projectors and flip charts and library development as the predictor variable and quality teaching as the criterion variable. The results obtained from the test statistical analysis are summarized and presented in Table 4.

Table 4
Regression analysis of quality teaching on interactive whiteboards, projectors and flip charts on quality teaching

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
	.270 ^a	.073	.059	5.19637		
Sources of variation	Sum of Squares	df	Mean Square	F-value	p-value	
Regression	418.061	3	139.354	5.161	.002 ^b	
Residual	5319.441	197	27.002			
Total	5737.502	200				
Variable	B	Std. Error	Beta	t-value	p-value	



(Constant)	38.096	2.697		14.123	.000
Quality teaching	-.226	.112	-.139	-2.013	.045
Interactive whiteboards	.198	.083	.165	2.395	.018
Projectors	-.203	.090	-.155	-2.263	.025
Flip charts					

*p<.05

Table 4 revealed that an R-value of .270 was obtained, resulting in an R-squared value of .073. This means that the variation in interactive whiteboard, projector and flip charts collectively accounted for about 73.0% of the total variation in quality teaching. Thus, the p-value (.000) associated with the computed F-value (5.182) is less than .05. As a result, the null hypothesis was rejected. This means that there are no significant composite and relative effects of interactive whiteboards, projectors and flip charts on quality teaching.

To test the significance of the combination of both the regression constant (28.096) and the regression coefficient Interactive whiteboards (-.226), projectors (.198), Flip charts (-.203), making a significant contribution to the predicted model that is, prediction on quality teaching (t=-2.013, 2.395 and -2.03, $p=.000 \leq p \leq .14.123$), thus, the absence of interactive whiteboard, projector and flip charts can reduce quality teaching among lecturers. The mathematical relationship (predict model) is depicted by the following equation $y=38.096, -.226_1, .198_2, \text{ and } -.203_3x$ where $y=$ interactive whiteboard, projector and flip charts and x is quality teachin

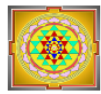
Discussions of findings

The findings of the study are discussed based on the hypotheses of the study

The finding revealed that interactive whiteboards do significantly predict quality teaching. This shows the need for an integrative whiteboard in schools teachers who utilize it are likely to display teaching and learning with swiftness. The findings agree with Abdullah, Ziden and Aman (2015) whose results revealed a statistically significant difference between arts and science students in terms of their attitude towards IT in favour of science students and also proved that there was no statistically significant correlation between students' academic achievement and their attitudes towards IT. Students at a medium level of academic achievement tended to score higher on the affection toward IT compared with students at a satisfactory level of academic achievement.

The finding for hypothesis two revealed that the use of projectors does significantly predict quality teaching. When teachers are exposed to projector, there is the possibility of enhanced performance. The result revealed that Chandra, Das and Samanta (2012) found that 60% of the students preferred PowerPoint in combination with blackboard teaching and only 20% of the students preferred PowerPoint presentation. Then 15% of students favoured the traditional blackboard teachings rather than the projector or PowerPoint class. About (5%) of students opted for the overhead projector.

Hypothesis three found that flip charts do significantly predict quality teaching. Obviously using flip charts can promote teaching as it will enhance the teachers' and students' ease of understanding basic concepts and principles. The finding is in line with the study of Oladina (2010)



result indicated a significant difference between the academic performance of control and experimental groups. In favour of the experimental group which shows the effect of flip chart instruction in instructional delivery of social studies. Similarly, Aryani (2018) result of the paired sample t-test showed there was a significant difference in vocabulary learning outcomes before and after the treatment in the experiment. It showed that the mean of the pre-test was 62.38 while the mean of the post-test was 86.13. The results of the independent sample t-test showed there was an improvement in vocabulary learning outcomes of the students who were taught through a flip chart.

Summary/conclusion

In the learning environment, quality teachers cannot be underestimated. This is due to its usefulness especially visual instructional strategies/technology which are not meant only for effective teaching, they are also an important tool for meeting the needs of all learners and making lessons accessible and easily understood by your students. Effective utilising visual teaching strategies and visual learning strategies in the school curriculum, the gap between information and learning, more effectively engages students in both in-person and remote or hybrid classrooms and helps students understand and retain concepts for better long-term learning outcomes. Integrate graphic organizers before, during, and after lessons to help students absorb information more effectively, and exercise different learning skills and understanding of the basic concepts needed for quality performance.

Recommendation

The following recommendations were drawn from the findings of the study

1. Schools should encourage the use of interactive whiteboards for enhanced quality teaching.
2. School management must enforce the use of projectors in all lecture delivery. This will reduce fatigue in the teaching process for enhanced quality teaching.
3. Teachers in all schools both primary, secondary and tertiary levels must adopt flip charts in classroom assessment and evaluation. This will promote quality in the learning process.

Implication for Classroom Management, Assessment and Evaluation

The study may also equip educational administrators in the Ministry of Education and test and measurement experts on the need for the provision of instructional materials for teaching especially in the public ones. Moreover, the result of this study will be of great significance to all curriculum planners. The curriculum developers will find the work useful in reviewing the curriculum by seriously laying emphasis on the utilization of instructional materials so that they will meet up emerging needs of education in our society.

The study may be of immense benefit to the teachers: It will motivate all teachers to develop an interest towards utilizing suitable teaching materials that will reduce failure in the teaching and learning of school subjects. The study will also help in clarifying among the teachers the need for continuous improvement of suitable instructional materials for teaching and learning various subjects.

Finally, the findings from this study may help all teachers in choosing appropriate instructional materials capable of releasing learners' tension towards the subject they teach thus improving their teaching effectiveness and learners' academic performance.

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