TEACHERS' EXPERIENCE WITH INTERACTIVE WHITE BOARD USAGE IN PRIVATE SCHOOLS IN PORT HARCOURT

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Abstract

The study seeks to x-ray teachers experience in the use of Interactive Whiteboard (IWB) for teaching in private primary schools. The study was guided by three research questions and three hypotheses tested at 0.05 level of significance. The descriptive survey design was adopted for the study. 68 teachers (21 male and 47 female) comprising of 28 science teachers and 40 mathematics teachers constituted the sample size for the study obtained through purposive sample technique. The data collecting instrument was titled "Experiences of Teachers using IWBs Questionnaire" (ETIWBQ) with a reliability index of 0.74. The findings of the study revealed that the teachers agreed to a large extent that Interactive White Board (IWB) enhances the teaching of science and mathematics in private schools, however maintained that lack of technical support, technology adoption, lack of skills and competencies required for technology integration, insufficient training for technology adoption and administrative support are barriers that impede the integration of Interactive White Board (IWB) for science and mathematics teaching. Recommendations were posited that will ensure effective usage of IWBs in the primary schools for optimum performance of learners.

Keywords: Teachers, Experience, Interactive Whiteboard, Technology,

Introduction

Emerging communication technologies present challenges for restructuring and transformation in teaching at all levels of education. It has provided new trends for teaching in institutions of learning in Nigeria. Beeland (2010) explained that evolving technologies are critical components of the educational experience for teachers and students as they provide greater access to vast information and resources, empowering the user to become free agent learners that are able to create meaningful, personalized learning experiences outside the traditional classroom. Among these evolving technologies, the smart board or interactive white board is currently one of the cutting edge instructional materials used for the purpose of teaching and learning. Interactive While Boards are used extensively in most advanced learning environments.

The entire premise of this technology is built upon active engagement in which touch-sensitive screens are mounted on the wall of the classroom and a projector shows information that can be manipulated and displayed with unlimited capabilities. The advantage of smart board technology is its design for use in spacious work area with group interaction. The enlarged visuals are easily seen due to the size of the interactive whiteboard. Participants become both visually and physically engaged as they connect with content and multimedia in a collaborative learning environment (Smart Technologies, 2004). Using special pens, teachers write directly on the screen, manipulate text and images, view websites, cut and paste research information, view video clips, formulate graphs and charts, and design vivid and creative presentations.

There is increasing awareness that teaching is a multi-modal activity, drawing upon a range of communicatory activities such as verbal, visual and interpersonal communication, as well as associated technologies. Jewitt (2002) has shown that knowledge of multi-modal perception and pedagogy can support both teachers and students toward the attainment of the desired objectives of learning. Competencies in teachers' application of the interactive white board not only enhance effective lesson presentation, it also proffers the development of learners' cognitive and physical abilities in solving problems. Teachers are able to model abstract ideas and concepts in new ways so that learners might respond to the activities and deepen their understanding (Miller, Glover & Avris, 2005). The use of the IWB may be the most significant change in the classroom learning environment in the present era as it bridges the relationship between multi-modal pedagogy, multy-

modal technologies and gesture as part of communications armory towards an efficient teaching and learning process.

Beeland (2002) found that learners showed positive interactive potentials and achievement in lessons where IWB was used when compared to learners in which IWB was not used. Beauchamp (2004), discussing the value of IWB use in science teaching, argue that it is a combination of the features of the IWB which can foster interactivity and that this is also dependent upon particular subject goals. Other researchers, like Cogill (2003) and Cuthell (2002) have also in various studies identified the potentials of the IWB use in terms of cognitive, affective and psychomotor development of learners. It is no gain saying that the adoption of IWB for the purpose of teaching and learning hinges on the premise of connectivism. This theory explains that knowledge is distributed across a network of connections (fields, ideas and concepts) and therefore that learning consists of the ability to construct and traverse those networks. The implication suggests that interacting with tools can expand mental capacities and collective intelligence, pooling knowledge and comparing information with others toward a common goal. In light of the above, this study seeks to investigate experiences of teachers using smart boards in selected private schools in Port Harcourt.

Statement of the Problem

Educational technology has witnessed a lot of positive developments with current use of interactive white boards (IWBs). In most developed nations like America and Australia, IWBs are widely used in private and public schools. It is pertinent to state that most developing countries like Nigeria have not fully subscribed to this revolutionary technology. Worst still, there is prevalence non-availability of ICT infrastructural tools in secondary schools in Nigeria and where these tools are available, teachers lack of knowledge and technical competencies are major setbacks in applying this tools for teaching and learning. Students' declining performance level in Nigerian secondary schools will continue to be a disturbing issue if adequate and concerted efforts are not channeled toward the use of interactive whiteboards and other relevant technologies for classroom teaching.

Research questions

The following research questions were used to guide the study;

1. To what extent do the use of Interactive White Board (IWB) enhances the teaching of science and mathematics in Private schools?
2. To what extent do male and female science teachers use Interactive White Board (IWB) to enhance the teaching of science and mathematics?
3. What are the barriers that affect effective integration of Interactive White Board (IWB) for science and mathematics teaching?

Hypothesis

Ho_1: There is no significance difference between the mean response values of science and mathematics teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Ho_2: There is no significance difference between the mean response values of male and female teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Ho_3: There is no significance difference between the mean response values of science and mathematics teachers on the barriers that affects the effective integration of Interactive White Board (IWB) for science and mathematics teaching.

Methodology

The research adopted the descriptive survey design. The design was employed to obtain quantitative data from the responded of the study. The population of the study consisted of all science and mathematics teachers in private primary schools in Port Harcourt, Rivers State. Using a purposive sample technique, 68 teachers (21 male and 47 female) also comprising of 28 science teachers and 40 mathematics teachers were employed for the study. These teachers were purposively used because of the availability of the Interactive White Board (IWB) boards in their schools and their knowledge of use during teaching and learning processes. The instrument for data collection developed by the researcher was titled “Experiences of Teachers using IWBs Questionnaire” (ETIWBQ). The research instrument consisted of two sections. Section A seek to obtain demographic details from the respondents while Section B is a 15 item statement structured on a modified four point Likert scale of Very High Extent (VHE) = 4 points, High Extent (HE) = 3

points, Low Extent (LE) = 2 points and Very Low Extent (VLE) = 1 point. Criterion index value of 2.50 was used as a measure for decision taking. Therefore, calculated mean less than 2.50 were considered to be High Extent (HE) while calculated mean equal to/or greater than 2.50 were considered Low Extent (HE). The instrument was validated by two experts in educational technology and their inputs ensure the development of the final draft of the instrument. The test retest method of an interval of one week was employed to obtain data for the calculation of reliability index of the instrument. Using the Person Product Moment Correlation Coefficient statistics, a reliability coefficient index of 0.74 was obtained making the instrument reliable for the study. Data collected upon the administration of the instrument were analysed using the mean, standard deviation and inferential statistics of z-test.

Result

Research question 1: To what extent do the use of Interactive White Board (IWB) enhances the teaching of science and mathematics in Private schools?

Table 1: Analysis of teachers' response on the use of IWB and Manipulatives.

S/N	ITEM STATEMENTS	MEAN	SD	DECISION
1	Teaching with IWB improves students' learning Experiences	3.74	1.23	HE
2	Interactive white board clarifies subject matter better	2.41	1.63	HE
3	The use of Interactive white board are mostly a great experience to improve knowledge and reduce rote memorization	3.02	1.24	HE
4	Interactive white board helps to enhance cognitive, affective and psychomotor skills amongst learners.	2.77	1.02	HE
5	Interactive white board assist children to learn concepts in a developmentally appropriate way.	2.80	1.32	HE
6	Interactive white board have a quick and simple procedure for instructional purpose	3.06	1.21	HE
7	Interactive white board is the best medium to impact knowledge and inspire learner.	2.59	1.00	HE
8	Interlocking centimeter cubes are effective for teaching of science and mathematics.	3.17	1.31	HE
9	Use of IWB enhance proper mastering of concepts required for problem solving.	2.63	1.24	HE
10	Retention of science and mathematics concepts is ensured through the use of IWB.	2.96	1.01	HE
	Aggregate mean	**2.92**	**1.22**	**HE**

Table 1 shows the analysis of teaching of science and mathematics in Private secondary schools. The calculated mean value of the item statements (1 -10) were all greater than the criterion mean value of 2.50 making the decision to be considered as High Extent. Furthermore, the aggregate mean value indicated a calculated of 2.92 which is greater than 2.50. Therefore, the findings of the study revealed that Interactive White Board (IWB) enhances the teaching of science and mathematics in private schools.

Research question 2: To what extent do male and female science teachers use Interactive White Board (IWB) to enhance the teaching of science and mathematics?

Table 2: Analysis of male and female teachers' response on the use of Interactive White Board (IWB).

S/N	ITEM STATEMENT	MALE			FEMALE		
		MEAN	SD	DECISION	MEAN	SD	DECISION
1	Teaching with IWB improves students' learning Experiences	2.87	1.03	HE	2.61	1.25	HE
2	Interactive white board clarifies subject matter better	3.14	1.17	HE	2.58	1.14	HE
3	The use of Interactive white board are mostly a great experience to improve knowledge and reduce rote memorization	2.58	1.32	HE	3.12	1.28	HE
4	Interactive whiteboard help to enhance cognitive, affective and psychomotor skills amongst learners.	2.92	1.04	HE	2.78	1.03	HE
5	Interactive whiteboard assist children to learn concepts in a developmentally appropriate way.	3.08	1.06	HE	3.11	1.02	HE
6	Interactive whiteboard have a quick and simple procedure for instructional purpose	3.21	1.11	HE	2.85	1.13	HE
7	Interactive whiteboard is the best medium to impact knowledge and inspire learner.	2.57	1.25	HE	2.67	1.09	HE
8	Interlocking centimeter cubes are effective for teaching of science and mathematics.	2.64	1.31	HE	2.54	1.00	HE

9	Use of IWB enhance proper mastering of concepts required for problem solving.	3.11	1.01	HE	2.71	1.22	HE
10	Retention of science and mathematics concepts is ensured through the use of IWB.	2.61	1.00	HE	2.68	1.10	HE
Aggregate mean		**2.87**	**1.13**	**HE**	**2.77**	**1.13**	**HE**

Source: Researchers field work, 2016

Analysis of Table 2 shows the response of male and female teachers on the use Interactive White Board (IWB) for science and mathematics teaching. Both the male and female teachers considered the use of Interactive White Board (IWB) to a high extent efficient for the teaching of science and mathematics. This is revealed based on the aggregate calculated mean value for male and female as 2.87 and 2.77 respectively which is greater than the criterion mean value of 2.50.

Research question 3: What are the barriers that affect effective integration of Interactive White Board (IWB) for science and mathematics teaching?

Table 3: Analysis of teachers' response of barriers towards Interactive White Board (IWB) and manipulatives for science and mathematics teaching.

S/N	ITEM STATEMENTS	MEAN	SD	DECISION
1	Resistance to technology adoption	3.45	1.21	HE
2	Lack of technical support	2.92	1.04	HE
3	Lack of skills and competencies required for technology integration	3.02	1.17	HE
4	Lack of sufficient training for technology adoption	2.73	1.23	HE
5	Lack of administration support	3.46	1.08	HE
	Aggregate mean	**3.12**	**1.15**	**HE**

Source: Researchers field work, 2016

The teachers also mentioned that certain factors act as barriers towards the effective integration of Interactive White Board (IWB) for science and mathematics teaching. The findings of the study revealed that lack of technical support, technology adoption, lack of skills and competencies required for technology integration, insufficient training for technology adoption and administrative support are barriers that impede the integration of Interactive White Board (IWB) for science and mathematics teaching which was shown from the calculated aggregate mean value of 3.12 as compare to the criterion mean value of 2.50.

Hypotheses

Ho_1: There is no significance difference between the mean response values of science and mathematics teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Table 4: T-test analysis of science and mathematics teachers mean response values

GROUP	N	Mean	df	T-cal	T-table	Decision
SCIENCE TEACHERS	28	27.96				
						ns
			66	0.096	1.990	
MATHEMATICS TEACHERS	40	25.43				

Source: researchers' field work, 2016.

Table 4 above is the t-test analyses of science and mathematics teachers mean response values on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects. The calculated T-value was obtained as 0.096 which was less than the T-table value of 1.990. Based on the compared values, the null hypothesis is retained indicating that there is no significance difference between the mean response values of science and mathematics teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Ho_2: There is no significance difference between the mean response values of male and female teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Table 5: T-test analysis of male and female teachers' response on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

GROUP	N	Mean	df	T-cal	T-table	Decision
MALE TEACHERS	21	28.80				
						ns
			66	0.033	1.990	
FEMALE TEACHERS	47	25.32				

Source: researchers' field work, 2016.

The t-test analysis at 0.05 significant level indicated that the calculated T-value was obtained at 0.033 while the table value was 1.990 at a degree of freedom of 66. Since the calculated T-value is less than the Table value, the null hypothesis is retained that there is no significance

difference between the mean response values of male and female teachers on the use of Interactive White Board (IWB) as it enhances the teaching of the subjects.

Ho_3: There is no significance difference between the mean response values of science and mathematics teachers on the barriers that affects the effective integration of Interactive White Board (IWB) for science and mathematics teaching.

Table 6: T-test analysis of science and mathematics teachers on the barriers that affects the effective integration of Interactive White Board (IWB) for science and mathematics teaching

GROUP	N	Mean	df	T-cal	T-table	Decision
SCIENCE TEACHERS	28	24.05	66	1.082	1.990	ns
MATHEMATICS TEACHERS	40	28.17				

Source: researchers' field work, 2016.

Table 6 is the t-test analysis tested at 0.05 level of significance showing teachers mean response on the barriers that affects the effective integration of Interactive White Board (IWB) for science and mathematics teaching. The result revealed that the T-calculated value was obtained at 1.082 while the table value was given as 1.990. since the T-table value is greater than the T-calculated value, the null hypothesis is retained indicating that there is no significance difference between the mean response values of science and mathematics teachers on the barriers that affects the effective integration of Interactive White Board (IWB) for science and mathematics teaching.

Discussion of findings

The study was concern on the experiences of teachers on the use of Interactive White Board (IWB) for science and mathematics teaching in private schools. The findings of research question one revealed that Interactive White Board (IWB) enhances the teaching of science and mathematics in private schools. Lending support to the finding of the study is the assertion of Miller, Glover and Avris (2005) were it was mentioned that the use technologies like Interactive White Boards (IWBs) in teaching which will create opportunity for students to be meaningfully involved and engaged in the learning process. Merriam (1998) stated that application of this technology ensures development of more effective demonstrations while (Kennewell & Morgan 2003) reiterated that ensures the presentation of varieties of learning experience that enhances students' achievement. Latham and

levy (2002) opined that integration of interactive white board for teaching and learning process provides the potential to meet the learning needs of a wider range of learners. Conclusively, interactive white board incorporate and use a range of multimedia resources in lessons such as written text, pictures, video, sound, diagrams, online websites which pastures all sensory channels of the learner.

Research question 2 was focused on male and female teachers' response on the effective integration of IWB to enhance teaching and learning process. The findings of the study revealed that both male and female teachers to a high extent agreed that IWB usage is an evolving technology that can stimulate learners' interest and enhance their performance when given task. The result of this study collaborates with the findings of Prestride (2012) were it was mentioned that this tool are essential for teachers because they facilitate the creation of lessons in terms of audio and virtual dimensions, presenting those lessons creatively and supports the acquisition of knowledge. Readiness and Zarbazoia (2012) also stressed that teachers; perception on the integration of these contemporary technological tools like IWB foe teaching provides collaborative and knowledge sharing paradigm, video conferencing, cloud computing and multimedia presentations.

Conclusively, the findings of the study identified certain barriers that could impede the effective integration of IWB for effective teaching in schools. Stones (1998) cited in Kgalemang, Leteane, Moakofhi, Pholele and Phiri (2015) found out in a study that teachers possibly show resistive tendencies to the use of technological teaching tools based on factors such as abhorrence or detestation of technology. Dexter, Anderson, and Becker (1999) opined those school administrators are critical factors that could hinder the implementation of IWB for teaching and learning. They further mentioned that it is imperative that teachers should have quality access and sufficient technical support in achieving the desired educational objectives.

Conclusion

The study was concern with the investigation of private schools teachers' experiences on the use of interactive whiteboard for effective teaching in the primary schools. The work has conspicuously revealed that teachers' integration of IWB can facilitate interaction, dialogic teaching and effective questioning between teachers and students. In the dialogic learning environment, there is knowledge sharing between teachers and students considering alternative knowledge sources that aid learning. All this systematic arrangement is put in place during IWB application for

teaching and learning. One major highpoint of the integration of IWB is the availability of interaction and support for all types of learners learning style which is the whole essence of all-inclusive teaching and learning process.

Recommendation

In light of the findings of the study, the following recommendations were put forward by the researcher, thus;

1. The use of instructional materials like IWB as a method and medium of teaching is essential and should be adopted for effective learning outcome in our primary schools. This will hence empower the students and the teachers.
2. Government and school administrators should provide these IWBs for all schools so that teachers would be acquainted in using them for teaching and learning.
3. Training and retraining progrmames are necessary for teachers toward continual development on the use of contemporary technological tools for teaching. Therefore, Government, corporate bodies and Non-Governmental Organization should organize programmes, seminar, conferences among others for teachers on the use of these technological tools.

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