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SMART BOARD TECHNOLOGY AND PERFORMANCE ENHANCEMENT IN TEXTILE DESIGN FOR JUNIOR SECONDARY SCHOOL IN BAYELSA STATE.

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ABSTRACT
This study, titled Utilization of Smart Board Technology In Textile Design Instruction For Enhancement of Performance In Junior Secondary School In Central Senatorial District, Bayelsa State will be carried out to investigate the factors responsible the unavailability of smart boards to teach students in secondary schools in Bayelsa State, Nigeria. Smart board is also known as interactive white board or is a large interactive board display board in the form of a white board. The interesting aspect of the board is that it is electronically operated and pictorial images are usually presented through it. Unfortunately, despite the commendable services smart board renders, it is observed that it is not available especially the teaching of textile in most secondary schools in Bayelsa State. This situation is grossly hampering on students' academic performance. Thus, in a bid to remedy the situation this study will outlines six objectives, research questions and hypothesis to guide the study. The study will review some cognate literatures in course of the study. Stimulus-response and master learning theories will form the theoretical framework for the study. The study will adopt correlational research design. To test the reliability of the instrument, the Spearman Browns Prophetic Formula will be used to test the result. Mean scores ranked order and standard deviation will be used to analyse the research questions. Pearson's product moment correlation coefficient will be used as statistical tool to analyse the hypothesis. The four hypotheses postulated will be tested using t-test at 0.05 level of significance. The analysis carried out was discussed. Findings obtained from the study were discussed. The study concludes that the use of smart board to teach textile in secondary is effective and when it is not available it affects students' performance. Thus, the study recommends that smart board should be provided in schools to encourage effective teaching and learning of textile. This research is believed to have contributed to knowledge because it helped to widen scope of knowledge in the use of smart board in teaching textile.

KEYWORDS: Smart Board, Smart Board Technology, Textile Industry, Educational Enhancement, Technology Integration.

INTRODUCTION
We are in a technological revolution era. It is hoped that this study brings forth findings to enhance the use of technological based resources, such as the interactive Smart Board to achieve schools' curriculum and meets states standards. Accelerated changes in information and technology have been very effective in education and other areas of life endeavours, which have brought about fundamental changes in traditional real-life classroom settings and teaching methods. The last two decades come the innovation of Smart Board that combines the computers, projector, and touch screen electronic board (Akbas and Pektas, 2011). The use of interactive whiteboard in art classroom environment has drastically changed the pattern of both the teacher and students attitudes to learning. More opportunities are exposed to students to get involved in active role in the learning process; rather than receiving information, restricting to text books or teacher lectures. With the use of whiteboard teaching, students gain a deeper comprehensive independent ownership from their lessons in the art classrooms. The following researcher: Hubbel, Pitler, Kuhn, and Malenoski (2007) stressed that the use of technology has an additional positive influence on the student learning, when comparing learning goals which are placed prior to the

use of technology. Furthermore, these aforementioned authors believe that implementation of technology with effective compliance will increase students learning ability, understanding and academic performance. The use of education technology, such as interactive whiteboard will trigger students' motivation, as well as promote cooperative learning, will also stimulates students' for critical thinking and problem solving skills.

It is important to note that interactive whiteboard compliance allows the teacher becoming a facilitator, rather than reinforcing teacher-centered style of teaching. Studies conducted on the effects of technology on students performance, concluded that students in compliance to computer simulations and applications scored higher on national Standardized tests than those students who did not integrate to digital base learning (Wenglinsky, 2000, Billig, 2003). Wenglinsky also observed that the students with higher performance on the test when their teacher is inclined to professional technological development training and support. (Wenglinsky 2000; Billig, 2003).

This study will be basically carried out in Bayelsa state and experimental student will be taken from three Local Government Areas of Bayelsa which includes Yenegoa Local Government Area, Kolokuma/Opokuma Local Government Area and Southern Ijaw Local Government Area.

STATEMENT OF THE PROBLEM

In our country Nigeria today there is doubt that despite government's commitment in ensuring that technology drive or facilitate the educational section in terms of enhancing effective teaching and learning, observations were made that, there are many factors that are militating against the actualization of the policy at the school and classroom level in ensuring that instructions are delivered to students or learners unhindered. Some of the factors identified include inadequate supply of infrastructure, electricity, internet connectivity, man-power skills as well as funding. Aduke (2008) identified that the unavailability of Smart Boards in most of the public schools in Nigeria is really affecting student's performance. Although, the Nigerian educational system has succeeded in partial integration of Information and Communication Technology (ICT) despite the hindrances, Government on its part provided some infrastructural facilities such as computer laboratories (Akintunde, 2006), internet connectivity but unfortunately they are inadequate (Harward et al., 2008; Oyelaran-Oyeyinka & Adeya, 2004). Similarly, very few secondary schools in the country have Interactive Whiteboard (IWB) in their classes (Aduwa-Ogiegbaen & Iyamu, 2005). Most especially in Borno state, consequently, most teachers are not familiar with this new device and are not optimally using the IWB in teaching and learning business (Mustapha & Gabasa, 2010). The situation expressed by the authors above is not quite different with what is observed in most public secondary schools in Bayelsa State, because observation shows that most schools do not have smart boards in their schools to facilitate effective teaching and learning in their schools.

The use of smart board in the classroom contributes to providing many advantages of using control means of texts, photos and drawings, taking advantage of the internet, the ability to store and retrieve instruction materials, provides opportunities to restore feedback, using the computer software and designing the computerized instructional activities, which help increase the effectiveness and participation of students during the class (Schuck & Keaney,2007). The teacher can explain the instructional material through the Smart Board with its pen and the properties relating to changing the font color, or size according to the desire of the teacher, which is commensurate with the instructional material to be provided to students. The board provides the diverse attribute in using the font to simplify the material. Similarly, Yaghmour (2018: p167) states that Smart Board as an instructional material in presenting lessons interact with students and stir their motivations. The role Smart Board play as an instructional aid or material in enhancing effective teaching and learning in institutions of learning is commendable and can never be overemphasized. It has really made the teaching of some subject to be ease for teachers. But unfortunately, despite the effectiveness of the Smart Board in enhancing teaching and

learning in schools it is not available or provided for teaching in most of the public secondary schools in Yenegoa Metropolis of Bayelsa State as stated earlier. This affects student's performance seriously and if nothing is done fast to remedy the situation it will get worst. Observably in school in few schools where smart boards are available teachers and students were not utilizing it for teaching and learning in the schools. So this constitutes ineffective teaching and learning of not just textile students but even students in other subject areas in the schools. This perhaps is caused by neglect and ignorance of the relevance of the use of Smart Board technology; this situation is affecting the students' poor academic performance in their examinations. Thus, the study is carried out to ascertain the effectiveness of the use of Smart Board technology to teach textile and academic performance of secondary school students in Yenegoa Metropolis of Bayelsa State.

OBJECTIVES OF THE STUDY

The aim of the study was to investigate the Adaptation of Smart Board Technology in Textile Instruction for Enhancement of Academic Performance of Students in Junior Secondary Schools in Central Senatorial District, Bayelsa State**.** While the objectives of the study were to:

1. Ascertain the pictorial effectiveness of textile materials displayed on smart board technology in textile instruction to enhance students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State.
2. Determine the relationship existing between the adaptation of smart board technology in textile instruction and enhancement of students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State.

RESEARCH QUESTIONS

The following research questions shall anchor then solutions to the entire work:

1. Does the display of pictorial images of textile materials been effective on Smart Board in textile instruction in enhancement of students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State?
2. Is there any relationship existing between adaptation of smart board technology in textile instruction and enhancement of students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State?

RESEARCH HYPOTHESES

1. There is no significant relationship existing between pictorial effectiveness of textile materials displayed on smart board in textile instruction and enhancement of students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State.
2. There is no significant relationship existing between adaptation of smart board technology in textile instruction and enhancement of students' academic performance in junior secondary schools in Central Senatorial District in Bayelsa State.

LITERATURE REVIEW

Conceptual Review

Concept of Smart Board

In addition to making learning more enjoyable and interesting for students, Smart Board intrinsically motivated the students to volunteer to demonstrate knowledge on the Board in front of their peers as a means of showcasing individual achievement. Extrinsically motivated students are enticed by the "wow factor" of the Smart Board and are motivated as a result of the enjoyment they experience from using the board. With the use of Smart Board, teachers develop many creative ways to capture students' attention and imagination. Bush et al. (2004), found that Smart Board made teaching more visual and learning more interactive which in turn,

encourages greater participation of the students, thus improving their motivation and concentration.

According to Cunningham et al. (2003), it is the visual nature of the Smart Board that keeps students on task as everyone in the classroom becomes more attentive watching the acts. Smith (2000), reports that 78 percent of students observed were motivated by an interactive Smart Board and experience increased understanding of subject matter when it was shown visually on a Smart Board instead of simple explanation. Smart Board promotes class discussion and improves students' explanation and presentation skills.

Sustained motivation is key to improving learning outcomes. This is because the use of text and pictures, animations and videos promotes visual learning. Pugh (2001) also observed that the interactivity and visuals of interactive Smart Board are complementary when teaching students with specific learning difficulties or disabilities. Interestingly, interactive Smart Board provide a clear focus on the classroom supports students understanding by reducing behavioural problems of frustration that makes the learners unable to keep up with the lesson. Many courses currently present no more than electronic versions of traditional classes without face to face interaction between instructor and students. These electronic courses often contain web materials that lack significant level of creativity or interactivity. Cognitive research suggests that the addition of smart board can actually improve the learning process if certain methods are employed. By using auditory and visual methods of presenting information, students can process that information more quickly thereby fostering an enhanced learning process. Yet it is not clear whether such online learning environment enhance learning outcomes of students or even meets the level of success of traditional classroom.

Smart boards provide many opportunities for teachers in the classrooms. According to Elaziz (2008), smart boards can work in conjunction with some other technologies. Thus, their use lets teachers reach a number of resources in the shortest time. Levy (2002) refers to smart boards that provide teachers with the means to integrate multimedia resources such as written text, video clips, soundtracks and diagrams into their classes. In this case, smart boards can bring variety into the class. Hence, they can commit teachers to arrange the classes based on the needs of students with different learning styles such as visual, auditory and kinesthetic (Miller & Glover, 2010). Smart Boards also help teachers to save the notes they have written on the board during class time. Therefore, smart boards allow the materials to be re-used, and thus it will be a time-saver for teachers (Elaziz, 2005). Moreover, the saved materials can help teachers by removing the need to write the same information on the board. Instead of preparing the same material over and over, teachers revise or add new things to save notes based on their reflection or students' feedback Smart boards have different advantages for teachers.

First, smart boards provide opportunity for more effective whole-class teaching. Second, they also allow teachers to manipulate documents from the board (Gerard, Widener & Greene, 1999). Therefore, the smart boards increase the conversation in the classroom since the teacher interacts with the students (Gerard et al., 1999). Third, the touch sensitive screen can help both teachers and students to interact with the board physically. Having, obtained knowledge of what smart board represent and its usefulness in enhancing teaching and learning this study decided to focus on using it to teach textile in Junior Secondary Schools in Bayelsa State.

Smart Board as an Instructional Aid For Enhancing Teaching And Learning

One significant dimension in teacher education that is getting a lot of consideration is related to the use of instructional materials. Instructional materials are those materials used by a teacher to simplify their teaching. According to Janusky (2022) instructional materials are the tools used in educational lessons, which includes active learning and assessment. They include both visual and audio-visual aids and could either be concrete or non-concrete. These instructional materials bring life to learning by stimulating students to learn. The use of instructional materials in the classroom has the potential to help the teacher explain new concepts clearly, resulting in better student

understanding of the concepts being taught. However, they are not ends in themselves but they are means to an end (Kadzera, 2006).It is held that good teaching resources can never replace the teacher but the teacher uses them to achieve their teaching and learning objectives. Some of the instructional materials necessary for effective teaching and learning of Social Studies include the chalkboard, models, graphs, charts, maps, pictures, diagrams, cartoons, slides, filmstrips, radio, and television (Kochhar, 1991). The importance of the use of these materials cannot be underscored because of its contribution towards enhancing teaching and learning.

Lockheed (1991) states that, instructional materials are critical ingredients in learning and that the curriculum could not be easily implemented without them. Kochhar (1991) corroborates that a teacher who has adequate and relevant teaching facilities is more confident, effective and productive. Similar sentiments are shared by Steel (1983) who asserts that relevant instructional materials enable the learners to have a clear understanding of Conflict and Conflict Resolution. Instructional materials are essential since they help the teacher and learners avoid overemphasis on recitation and rote learning that can easily dominate a lesson. Resource materials allow learners to have practical experiences which help them to develop skills and concepts and to work in a variety of ways.

Samuel (2009) explained that as classroom teachers, it is essential that we become conversant with the type of instructional materials, which can be used in any teaching/ learning situations. The author further states that instructional materials are synonymous with what we call 'teaching aids' here in Nigeria. Instructional materials constitute alternative channels of communication, which a teacher can use to convey more vividly instructional information to learners. They represent a range of materials which can be used to 'extend the range of vicarious experience' of learners in a teaching-learning situation. According to him, in Nigeria, Educationists have realized the importance of these instructional materials for effective classroom teaching. However, in 1945 and in 1985, the federal ministry of Education organized an exhibition of improvised materials by instructional developers all over the federation. The major aim of these exhibitions were to identify materials, which teachers have improvised as include hopefully, to their further refinement through the process of formative evaluation. Though a center for educational technology has sprung up in colleges of education and universities all over the country, it is doubtful if most practicing teachers and educational authorities in Nigeria are aware of the benefits that can be derived from the use of instructional materials for teaching textile in Junior Secondary Schools in Nigeria. The truth is most Junior Secondary School teachers and their operators are not aware of the benefits the use of instructional materials or aids offer to learners that is why most Junior Secondary Schools in Bayelsa State do not have smart board to enhance or facilitate teaching and learning in most of Junior Secondary Schools.

Conceptualizing Textile technology.

Textiles are two-dimensional art in the class of applied art (Banjoko, 2000: p46). Batter (2009: p) also states that textiles are formed by weaving, knitting, crocheting, knotting, or pressing fibres together. While, the word fabric and cloth are used in textile assembly trades (such as tailoring and dressmaking) as synonyms for textile. However, there are subtle differences in these terms in specialized usage. Textilerefers to any material made by interlacing fibers (Abamowicz, 1998).

It is obvious that textile is a practical base topic in the subject fine arts or creative arts in Junior Secondary School in Bayelsa State, Nigeria. Teaching textile effectively will help give students opportunity to be self-reliant after school. The important thing is that teaching it requires a lot of materials and facilities and one of such facility as mention earlier to use to teach it effectively at this point in time is Smart Board. Unfortunately, it was observed that in most of the public secondary schools in Bayelsa State smart board available for teaching this subject is negatively affecting students' academic performance. This is why this study is carried out to obtain the effect of the unavailability of Smart Board in textile instruction and students' academic performance in junior secondary schools in Bayelsa State.

METHODOLOGY

This study will adopt survey research design. Survey research design deals with a group of people or items that can be studied by collecting and analyzing data from only a few people considered to be representatives of the entire group (Nworgu, 1991:p55). Creswell (2014) states that that it is the study of a group of people or items by collecting and analyzing data from only a few people or group of items considered to be representative of the entire group. Ogbazi and Okpara (1991:p2,4) support Olaitan and Nwoke by corroborating that a survey study involves the use of questionnaires and interviews to determine the options, preferences, attitudes and perceptions of people and about issues. Survey design does not make decision for administration but can provide it with information in which to base sound decisions.

This study will be carried out in Yenegoa metropolis the capital of Bayelsa State.

Conversely, despite the numbers of higher institutions and secondary schools in the state created by government, it is appears that in some of the institutions the necessary facilities and equipment are inadequate to enhance or facilitate teaching and learning in the schools. The situation of inadequate facilitates for teaching and learning in some of the schools is affecting the teaching and learning of textile especially in Junior Secondary Schools. This one reason among others why this research is carry out to unveil the situation of unavailability of instructional materials like the smart board in some of the Junior Secondary Schools in the state.

The population of this study consists of all the government public junior secondary school students in Yenegoa metropolises which are owned by the Bayelsa State Universal Basic Education Board (UBEB).

Out of the total population, 360 Junior Secondary School class three (J.S.S.3) students offering Fine Art within the secondary schools in the Metropolis formed the sample for the study. A simple ballot technique will be used to pick 60 students from each school which formed the sample size as sampled. The balloting will be made by using papers marked yes and no folded and shuffled in a small container, the students will be asked to pick one of the papers. Those who pick "yes" will be used while those who pick "no" will be dropped.

The following schools will bde used for the sampling:

i. Government Girls Secondary School, Amarata
ii. Government Secondary School, Agudama Epie
iii. Community Secondary School, Azikoro; and
iv. Government Secondary School, Igbogene,

The instrument to be used for this study is a simple structured questionnaire on the problems of Smart Board in the Teaching of Textile and Student Academic Performance in Junior Secondary Schools in Bayelsa State (STTASAPJSSIBS). The responses from respondents through the questionnaire will provide the necessary data which will be used for analysis. Research assistants from among the art teachers within the schools will be selected and used to facilitate the study. The teachers that will be selected must be specialists in Fine Art. They however will be briefed with all the details on their roles and expectation on the study. The teachers will join the researcher to administer the questionnaires to respondents which will be collected later by the researcher to carry out the analysis.

The data collected was analyzed using Pearson's product moment correlation coefficient (PPMC) to test the relationship existing between the variables.

PRESENTATION OF RESEARCH QUESTIONS

Research Question One: What is the relationship between the display of pictorials of textile materials, images shown on Smart Board and enhancement of teaching and learning of textile in secondary schools in Bayelsa State?

Table 1: Summary of Relationship Test between display of pictorials of textile materials, images shown on Smart Board and enhancement of teaching and learning of textile

Variables	∑X ∑Y	$\sum X^2$ $\sum Y^2$	∑XY	r_{cal}
Display of pictorials of textile materials, images shown on Smart Board	850	2090	3775	0.551
Enhancement of teaching and learning of textile	1593	7137		

Source: Field survey, 2023

Summary of result in Table 1indicates that that the correlation index (r) is 0.551 indicating a moderate relationship between display of pictorials of textile materials, images shown on Smart Board and enhancement of teaching and learning of textile. Thus, the display of pictorials of textile materials, images shown on Smart Board has a moderate positive relationship to the enhancement of teaching and learning of textile in secondary schools in Bayelsa State.

Research Question Two: Is there any relationship existing between the uses of Smart Board in the teaching and learning of textile in secondary schools and students' academic performance in Bayelsa State.

Table 2: Summary of Relationship Test between uses of Smart Board in the teaching and learning of textile and academic performance

Variables	∑X ∑Y	$\sum X^2$ $\sum Y^2$	∑XY	r_{cal}
Uses of Smart Board in the teaching and learning	885	2265	3239	0.754
Academic performance	1332	5160		

Source: Field survey, 2023

The result from Table 2 shows the summary of the Pearson Product Moment Correlation (PPMC) of the relationship between uses of Smart Board in the teaching and learning of textile in secondary schools and students' academic performance. The result of the analysis shows an r-value of 0.754. This indicates that uses of Smart Board in the teaching and learning of textile in secondary schools has a high positive relationship to academic performance of secondary school students in Bayelsa State.

TESTING OF NULL HYPOTHESES

Null hypothesis One: There is no significant relationship existing between pictorial effectiveness of textile materials shown on Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

Table 3: Summary of PPMC Significant Relationship Test between pictorial effectiveness of textile materials shown on Smart Board and students' academic performance

	∑X ∑Y	$\sum X^2$ $\sum Y^2$	∑XY	r_{cal}	df	r_{crit}	Decision
Pictorial effectiveness of textile materials shown on Smart Board	850	2090	3775	0.551	358	0.196	Reject Null Hypothesis
Students' academic performance	1593	7137					

Summary of result in Table 3 indicates that at 0.05 level of significance and with a df of 358, the calculated r value (0.551) is greater than the critical value of r (0.196), this leads to the rejection of the null hypothesis. Therefore, there is a significant relationship existing between pictorial

effectiveness of textile materials shown on Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

Null hypothesis Two: There is no significant relationship existing between the use of Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

Table 4: Summary of PPMC Significant Relationship Test between use of Smart Board in the teaching and learning of textile and students' academic performance

	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r_{cal}	df	r_{crit}	Decision
use of Smart Board in the teaching and learning of textile	885	2265	3239	0.754	358	0.196	Reject Null Hypothesis
Students' academic performance	1332	5160					

Summary of result in Table 4 indicates that at 0.05 level of significance and with a df of 358, the calculated r value (0.754) is greater than the critical value of r (0.196), this leads to the rejection of the null hypothesis. Therefore, there is a significant relationship existing between the use of Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

DISCUSSION OF RESULTS

Relationship between pictorial effectiveness of textile materials shown on Smart Board in the teaching and learning of textile and students' academic performance

The result in table 3 reveal that at 358 degree of freedom and .05 alpha level, the critical r value is less than the calculated r value. Since the r_{cal} is greater than the r_{crit}, the null hypothesis is rejected. Thus, there is a significant relationship existing between pictorial effectiveness of textile materials shown on Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State. This finding supports the findings of Gursory&Celikor (2017) who carried out a study on the effects of smart board applications on students' attitudes in pattern-making teaching. The findings of the study enabled the authors to make the conclusion that the boring and monotone pattern-making lessons in clothing education will become more fun and attractive by the use of smart boards in vocational high schools and universities. Hence, because students' attitudes will be more positive in the pattern-making courses, they will probably be more successful with the use of smart board.

Relationship between use of Smart Board in the teaching and learning of textile and students' academic performance

The result in table 4 reveal that at 358 degree of freedom and .05 alpha level, the critical r value is less than the calculated r value. Since the r_{cal} is greater than the r_{crit}, the null hypothesis is rejected. Thus, there is a significant relationship existing between the use of Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

This finding supports the views of Dme.us.com, (2018) who opines that for teachers and students, the interactive white board is a powerful benefit to the classroom. It opens up the students to collaboration and closer interaction to the lessons. Multimedia content can be shared and used in lectures, keeping students engaged. Again, the findings of the study is in agreement with the views of Kormaz and Cakil (2013) who points out that the most prominent benefits of smart boards are that they address more sense organs, provide visuality and make major contribution to

the process of learning, provide time saving, enable the use of all kinds of visuals in computer environment as teaching tools and make the topics easy, enjoyable and interesting.

FINDINGS

The following were the findings of this study:

1. There is a significant relationship existing between pictorial effectiveness of textile materials shown on Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.
2. There is a significant relationship existing between the use of Smart Board in the teaching and learning of textile and students' academic performance in secondary schools in Bayelsa State.

CONCLUSION

In bringing the research to a conclusion, it will be pertinent to mention that, the research work was motivated by the observed fall of performance of students in public secondary schools in Bayelsa State. And in bit to proffer remedy the issue of unavailability smart boards in the schools. This study is carried out to obtain the significant of smart board towards students' academic performance and the results from the findings in this study revealed that there is significant relationship in the use of smart board to teach textile in secondary schools in Bayelsa State. Thus, this study concludes that if smart boards are provided in all the secondary schools it will make so much impact in improving students' academic performance. The study also concludes that while using the smart board to teach Fine Art or possible textile, textile visual like fabric as the case may be should be projected on the screen to enhance teaching and as a way of providing solution to students' academic performance in the schools.

RECOMMENDATIONS

Consequent to the findings of the research, the research makes the following recommendations:

1. Having obtain the how significant of smart board can aid or facilitate teaching and learning in secondary schools the study recommends that those saddled with the responsibility of providing smart board should do the needful to ensure that smart board are provided in the schools.
2. There is need for teachers and students to effectively utilize the smart board as to enable them obtain academic excellence in their examination and class work.
3. There is also need for stakeholders to provide the necessary materials energy (Electricity) that will aid the smart boards to functions in some schools that have smart boards.
4. Stakeholders should also train operators of smart board to effectively utilize the smart board to teach.

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REFERENCES

Aduke, A.F. (2008). Usage and challenges of information communication technology (ICT) teaching and learning in Nigerian Universities. *Asian Journal of Information Technology,* 7(7), 290 – 295

Aduwa – Ogiegbaen, S.E. & Iyamn, E.O.S. (2005). Using information and communication technology in secondary schools in Nigeria: *Problems and prospects. Educational technology and society*, 8 (1), 104 – 112.

Akbas, O & Pektas, H.M. (2011). The effects of using an interactive whiteboard on the academic achievement of University Students. *Asia-Pacific forum on science Learning and Teaching*, 12(2), 1-9.

Akintunde, S.A. (2006). State of ICT's in tertiary institutions in Nigeria. Window on the Universities. *Paper presented at the compendium of paper presented at the 14th Annual National Conference and AGM of Nigerian Library Association, Abuja*.

Balta, N. & Duran, M. (2015). Attitudes of students and teachers towards the use of interactive school classrooms. *Turkish online journal of educational technology* – TOJET, 14(2), 15 – 21.

Beeland, W.D. (2002). Student engagement, Visual learning and technology: can interactive white boards help? *Unpublished paper presented at the meeting of annual conference of the association of information technology for teaching education, trinity college, Dublin.*

Bell, M. A. (1998). Teachers' perceptions regarding the use of the interactive electronic white board in instruction. Accessed 28th July, 2021. www.smarterkids.org/research/paper6.asp, Bayler University.

Blanton, B & Helms – Breazeal, R. (2000). Gain in self-Efficacy: using smart board interactive white technology in special education classroom. Accessed 28th July, 2021. www.smartkids.org.

Bush, (2004). Smart board made teaching more visual. www.smarterkids.org. accessed 28th July, 2021.

Cox, P.M. (2003). Educational technology. Away to enhance student achievement on the use of smart board. Cox + ET x A1 + 2003 + out smart board & hl = en & as = O & as = Vis = & oi

Cunningham, M. (2003). Laptops for Teachers: An evaluation of the first of the initiative. Retrieved September, 30th, 2021. www.becta.

De Vita, M. Versechaffel, L. & Elen, J. (2018). The power of interactive white boards for secondary mathematics teaching: Two case studies. *Journal of Educational Technology Systems,* 47(1), 50-78.

Dme. Us. Com, (2018). *The growing use of interactive white boards in schools*https://www.dme.us.com/2018/06/12/the-grwoing-use-of-interative-white-boards-in schools/#ilightboxgallery19801/0

Elaziz, F. (2008). Attitudes of students and teachers towards the use of interactive white boards in EFL classrooms. Unpublished Master's Thesis, Bukent University Ankara

Har Ward, V.J., Del Alamo, J.A., Lerman, S.R., Barley, P.H., Carpenter, J. DeLong, K, Jabboure, 1/(2008). The ilab shared architecture: *A Web services infrastructure to build*

communities of interact accessible laboratories. Proceeding of the IEEE, 96(6), 931 – 950.

Hein, G.E (1991). Constructivist learning theory. http://www.exploratorium.edu/ifi/resouces/constructivistlearning.html. Accessed 28 June 2021.

Kent, P. (2003). E-Teaching – the elusive promise Accessed 28th July, 2021. http://edcompass. Smarttech.com/en/learning/research/pdf/kent/.pdf.

Korkmaz, O. Kakil, I. (2013). Teacher Difficulties about using smart boards. Procedia – social and behavioral sciences 83:595-599.

Levy, P, (2002). Interactive whitboards in teaching and learning in two Sheffield schools. A developmental study. Sheffield: Sheffield University.

Malik, S. (2021). What is a smart board and what is if use for? https://www.adept.co.uk/what-is-a-smart-board-and-what-is-it-use-for/

Mercer, N., Hennessy, S., & War wick, p. (2010). Using interactive whiteboards to orchestrate classroom dialogue. *Technology, pedagegy and education*, 19(2), 195 – 209.

Moscolo, M.F., & Tischer, K.W. (2005). Constructivist theories. Cambridge encyclopedia of child development (pp. 49 – 63). *Cambridge, England: Cambridge University press*.

Mun, S.H. & Abdullah, A. H. (2016). A review of the use of smart boards in education. https://www.researchgate.net/publication/3/3805654-A-review-of-the-use-of-the-use-of-smart-boards-in-education. Accessed 28th July, 2021.

Mustapha, B.A. & Gabasa, A.J. (2010). Benefits of integrating computer technology as instructional reforms into classroom teaching at Junior Secondary Schools and Technical Colleges in Borno State.

Oyelaran – Oyeyinka, B. & Adeya, C.N. (2004). Interact access in Africa: Empirical evidence from Kenya and Nigeria. Telematics and information, 21 (1), 67 – 81.

Regonial, P. (2015). Conceptual framework; *A step guide on how to make one*. https://simplyeducation.me/2015/01/05/. Accessed 28th June, 2021.

Sawin, M & Safieh, L.A. (2012). Connectivism as a learning theory; Advantages and disadvantages based on teacher's views. *International Journal of wireless information networks & business information system (WINBIS).* Vol. 5: issue on September & October.

Sgymour, P. (1995). Description of how smart board play a part in education, IMT

Solvic (2001). Improving student learning outcomes and streamlining lesson planning: *smart technologies inc. bursary.* (Accesses 28th June, 2021 www.virtuallearuning.org.uk/whiteboard.

Toolshero.com (2020). Conceptual framework. https://www.ifre.org/issued-standards/list-of-standards/conceptual-framework. Accessed 28th June, 2021.

Ukwueze, F.N. & Onyia A.A., (2014). The effect of smart board on students achievement in computer studies in Nigerian Tertiary Institutions. *Journal, (CERJ.)* Vol/ 1. No1.2014pp.134 – 139.

Waldema.ed (2020). *Theoretical and conceptual frameworks*https://simpleeducate.me/2015/01/conceptual - frame work - guide. Accessed 28th June, 2021.