

SMART BOARD TECHNOLOGY AND JUNIOR SECONDARY STUDENTS' PERFORMANCE IN TEXTILE DESIGN IN BAYELSA STATE

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Abstract

The study of Smart Board Technology and Junior Secondary Students' Performance in Textile Design in Bayelsa State was aimed at investigating the relationship between students studying textile design in traditional classroom/workspace and students studying textile design with smart board technology. Some cognate literatures were reviewed in course of the study. The study adopted quasi-experimental research design (correlational research design). It outlined two objectives, research questions and hypotheses that guided the study. The hypotheses were tested using T-test at 0.05 level of significance. To establish the relationship between variables, the information was collected and turned to data which were analyzed with the use of Analysis of Covariance (ANCOVA) to test the relationship existing between Smart Board in the Teaching of Textile and Student Academic Performance in Secondary Schools in Bayelsa State. The responses from the

questionnaire were tailed to objective question (OBJ), see appendix. Findings obtained from the study revealed as follows. That there is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods ($F_{1, 97}=1.925$, $p\text{-value}=.168$) among others. The study concluded that the use of smart board for textile instructions to students in junior secondary schools is effective and enhances students' interest in participation than traditional teaching method. Thus, the study recommended that smart board should be provided and be used in all junior secondary schools in Central Senatorial District, Bayelsa State.

Keywords: Smart Board, Technology Integration, Teaching and Learning of Textile, Students' Academic Enhancement

Introduction

We are in a technological revolution era. It is hoped that this study brings forth findings to enhance the use of technology based resources, such as the interactive Smart Board to achieve schools' curricula objectives and meets expected standards. Accelerated changes in information communication 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 ushered in 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 teaching and learning among teacher and students. More opportunities are exposed to students to be actively involved in the learning process; rather than obtaining information, restricting to text books or lectures. With the use of interactive whiteboard in teaching, students gain a deeper comprehensive independent ownership from their lessons in the art classrooms. Hubbel, (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 author believe that implementation of technology with

effective compliance will increase students learning ability, understanding and academic performance. The use of educational technology, such as interactive whiteboard will trigger students' motivation, as well as promote cooperative learning, it 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 therefore observed that the students with higher performance on the test when their teacher is inclined to professional technological development training and support. Arising from the above narrative, it becomes imperative to investigate Smart Board Technology and Academic Enhancement in Textile Design for students in Junior Secondary Schools in Bayelsa State.

Statement of the Problem

In Nigeria, there is doubt that despite government's commitment in ensuring that technology drive or facilitate the educational section in terms of enhancing teaching and learning, many factors militating against the realization of the policy at the school and classroom level in ensuring that instructions are delivered to students or learners unhindered. Some of the factors include inadequate supply of infrastructure, electricity, internet connectivity, man-power skills as well as funding. Although, the Nigerian educational system has succeeded in partial integration of Information Communication and Technology (ICT) despite the hindrances, Government on its part provided some infrastructural facilities such as computer laboratories, internet connectivity, unfortunately, they are inadequate. Again, it appears that most schools seemingly do not have smart boards to facilitate effective teaching and learning especially textile 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. 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, 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. Unfortunately, despite the effectiveness of the Smart Board in enhancing teaching and learning in schools, its availability or provision for teaching in most of the public junior secondary schools in Yenegoa Metropolis of Bayelsa State has remained doubtful as stated earlier. This affects student's performance on the negative and if nothing is done fast to remedy the situation it will worsen. Even in few schools where smart boards are available, teachers and students are not utilizing them for effective 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. Perhaps this is caused by neglect and ignorance of the relevance of the use of Smart Board technology in teaching and learning; a situation affecting the students' poor academic performance in their examinations. The above discourse constitutes the problem of this study.

Objectives of the Study

The aim of the study was to investigate Smart Board Technology and Junior Secondary Students' performance in textile design in Bayelsa State. While the specific objectives of the study were to:

1. Determine the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods?
2. Ascertain the difference in the performance of male and female students taught textile designs using smart board technology?

1.4 Research Questions

1. What is the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods?
2. What is the difference in the performance of male and female students taught textile designs using smart board technology?

Research Hypotheses

Ho₁: There is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods.

Ho₂: There is no significant difference in the performance of male and female students taught textile designs using smart board technology.

Literature Review

To make learning more enjoyable and interesting for students, Smart Board intrinsically motivates the students to take active ownership of learning as they demonstrate knowledge on the board before their peers as a means of demonstrating individual achievement. Extrinsically motivated students are enticed by the “visual displays” on the Smart Board and also as a result of the enjoyment they experience from using the board. Through the use of Smart Board, teachers develop many creative ways to capture students’ attention and imagination. Bush (2004), avers that Smart Board made teaching more visual and learning become more interactive which in turn, encourages greater participation amongst students, thereby 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 actions. Smith (2000), reports that 78 percent of students 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) stated 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 reforming behavioral problems of frustration that makes the learners unable to keep up with the lesson. Many courses currently are presented in electronic versions, the 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 enhanced learning process. Yet it is not clear whether such technological 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 design 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 lessons. 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 in schools 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 and learning situation. According to him, 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 the exhibitions were to identify materials, which teachers have improvised as include hopefully, to their further assessment 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. 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 schools.

Conceptualizing Textile Technology.

Textiles are two-dimensional art in the class of applied art (Banjoko, 2000: p46). According to Batter (2009: p), 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. Textile refers 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 major 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 unavailable for teaching this subject is negatively affecting students' academic performance. This is why the study, and 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 adopted 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). A survey study involves the use of questionnaires and interviews to determine the options, preferences, attitudes and perceptions of people and about issues. It does not make decision for administration but can provide it with information in which to base sound decisions.

The population of the study consists of all the government public junior secondary school students in Yenegoa metropolis 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 schools in the Metropolis formed the sample for the study. A simple ballot technique was used to pick 60 students from each school which formed the sample size as sampled. The balloting was made by using papers marked yes and no folded and shuffled in a small container, the students were asked to pick one of the papers. Those who pick "yes" were used while those who pick "no" were dropped.

The following schools were used for the sampling:

Government Girls Secondary School, Amarata
Government Secondary School, Agudama Epie
Community Secondary School, Azikoro; and
Government Secondary School, Igbogene,

The instrument used for this study is simple structured questionnaire on the use of Smart Board in the Teaching of Textile and Student Academic Performance in Junior Secondary Schools in Bayelsa State (SBTT SAP). The responses from respondents through the questionnaire provided the necessary data which were used for analysis. Research assistants from among the art teachers within the schools were selected and used to facilitate the study. The teachers that were selected are specialists in Fine Art. They however were briefed on their roles and expectation on the study. The teachers joined the researcher to administer the questionnaires to respondents which were later collected by the researcher to carry out the analysis.

The data collected were analyzed with the use of Analysis of Covariance (ANCOVA) to test the relationship existing between Smart Board in the Teaching of Textile and Student Academic Performance in junior Secondary Schools in Bayelsa State.

Presentation of Research Questions

Research question 1: What is the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods?

Table 1: Summary of descriptive statistics on the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods.

		Pretest		Posttest		Gain	
Treatment	N	Mean	SD	Mean	SD	Mean	SD
Smart Board Technology	50	23.60	5.15	51.44	6.82	27.84	6.85
Traditional Teaching Method	50	26.00	5.98	49.14	9.22	23.14	12.09

The result from Table 1 above shows the summary of descriptive statistics on the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods. The result further shows that the pretest mean scores of the

students taught textile designs using smart board technology was 23.60, SD=5.15 whereas their posttest mean scores were 51.44, SD=6.82 and then their mean learning gain was 27.84, SD=6.85. The result also shows that the pretest mean scores of the students taught textile designs using traditional teaching method was 26.00, SD=5.98 whereas their posttest mean scores were 49.14, SD=9.22 and their mean learning gain was 23.14, SD=12.09. The result indicates that students taught textile designs using smart board technology performed better than their counterparts who were taught using traditional teaching methods.

Research question 2: What is the difference in the performance of male and female students taught textile designs using smart board technology?

Table 2: Summary of descriptive statistics on the difference in the performance of male and female students taught textile designs using smart board technology.

		Pretest		Posttest		Gain	
Gender	N	Mean	SD	Mean	SD	Mean	SD
Male	24	23.96	5.10	52.50	6.59	28.54	5.21
Female	26	23.27	5.28	50.46	7.01	27.19	8.13

The result from Table 2 above shows the summary of descriptive statistics on the difference in the performance of male and female students taught textile designs using smart board technology. The result further shows that the pretest mean scores of the male students taught textile designs using smart board technology was 23.96, SD=5.10, whereas the posttest 52.50, SD=6.59, and their mean learning gain was 28.54, SD=5.21. The result also shows that the pretest mean scores of female students taught textile designs using smart board technology was 23.27, SD=5.28, whereas their posttest mean scores were 50.46, SD=7.01 and their mean learning gain were 27.19, SD=8.13. The results indicate that male students were slightly higher than that of female students suggesting that male students experienced a slightly larger increase in their performance scores compared to female students when taught textile designs using smart board technology.

Testing of Null Hypotheses

Ho₁: There is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods.

Table 3: Summary of Analysis of Covariance (ANCOVA) on the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods.

Source	Type Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	132.366 ^a	2	66.183	.996	.373
Intercept	11884.165	1	11884.165	178.883	.000
Treatment	127.920	1	127.920	1.925	.168
Pretest	.116	1	.116	.002	.967
Error	6444.224	97	66.435		
Total	259485.000	100			
Corrected Total	6576.590	99			

a. R Squared = .020 (Adjusted R Squared = .000)

The result from Table 3 above shows the summary of Analysis of Covariance (ANCOVA) on the difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods. The result further shows that there is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods (F1, 97=1.925, p-value=.168). The null hypothesis one was retained at .05 level of significance.

Ho₂: There is no significant difference in the performance of male and female students taught textile designs using smart board technology.

Table 4: Summary of Analysis of Covariance (ANCOVA) on the difference in the performance of male and female students taught textile designs using smart board technology.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	351.583 ^a	2	175.791	4.284	.020
Intercept	3575.748	1	3575.748	87.135	.000
Gender	36.203	1	36.203	.882	.352
Pretest	299.724	1	299.724	7.304	.010
Error	1928.737	47	41.037		
Total	134584.000	50			
Corrected Total	2280.320	49			

a. R Squared = .154 (Adjusted R Squared = .118)

The result from Table 4 above shows the summary of Analysis of Covariance (ANCOVA) on the difference in the performance of male and female students taught textile designs using smart board technology. The result further shows that there is no significant difference in the performance of male and female students taught textile designs using smart board technology ($F_{1,47}=.882$, $p\text{-value}=.352$). The null hypothesis two retained at .05 level of significance.

Summary of Findings

The following were the findings of this study:

- 1 The result shows that there is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods ($F_{1, 97}=1.925$, $p\text{-value}=.168$).
- 2 The result also shows that there is no significant difference in the performance of male and female students taught textile designs using smart board technology ($F_{1,47}=.882$, $p\text{-value}=.352$).
- 3 The result further shows that there is no significant interaction effect of the treatment and gender in the performance of textile designs. ($F_{1,95}=1.974$, $p\text{-value}=.174$).

Discussion of Findings

Relationship between Smart Board Technology and students' academic performance

The result shows that there is no significant difference in the performance of students taught textile designs using smart board technology and those taught using traditional teaching methods ($F_{1, 97}=1.925$, $p\text{-value}=.168$). 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, students' attitudes will be more positive in the pattern-making courses, they will probably be more successful with the use of smart board.

The finding also 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 pointed 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.

Conclusion

In bringing this paper to a conclusion, it would be pertinent to note that, the work was motivated by the observed fall of performance of students in public junior secondary schools in Bayelsa State. Proffering solution to the issue brought about investigating smart boards technology and students' academic performance in junior secondary schools in Bayelsa State. The authors engaged in a comparative study to investigate the significance of smart board towards students' academic performance and the results from the findings revealed that there is no significant relationship in the use of smart board to teach textile in junior secondary schools in Bayelsa State and the use of traditional method. Thus, the study concludes that if smart

boards are provided in all the schools, it would make so much impact in improving students' interest in participation. The study also concludes that while using the smart board to teach textile design, it should be projected on the screen to enhance teaching and learning. That, would be meaningful as a way of providing solution to students' academic performance in the schools.

Recommendations

Having obtained the contributions of smart board to aid or facilitate teaching and learning in junior secondary schools the study recommends that:

1. Those saddled with the responsibility of providing smart board should do the needful to ensure that smart board are provided in the schools.
2. Teachers and students should effectively utilize the smart board in teaching and learning to enable them obtain academic excellence in their examination and class work.
3. Stakeholders should provide the necessary materials, energy (Electricity) that will aid the smart boards to function optimally in the schools that have smart boards.
4. Stakeholders should also train operators of smart board to effectively utilize the smart board to teach. This research is believed to have contributed to knowledge by widening the scope of knowledge in the use of smart board in teaching textile.

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