



## SECONDARY SCHOOL TEACHERS' AWARENESS AND UTILIZATION OF INTERACTIVE WHITEBOARD IN TEACHING AND LEARNING OF COMPUTER STUDIES IN NNEWI EDUCATION ZONE OF ANAMBRA STATE NIGERIA

BY

Dr. Anusiuba Overcomer Ifeanyi Alex

Department of Computer Science, Faculty of Physical Sciences, Nnamdi Azikiwe University, Awka, Nigeria



### Article History

Received: 11/09/2024

Accepted: 18/09/2024

Published: 20/09/2024

Vol – 2 Issue – 9

PP: - 01-07

### Abstract

Educational organizations are increasingly adopting new technologies to enhance educational outcomes, with interactive whiteboards (IWBs) being one of the prominent technologies embraced by schools. An IWB can function as a standalone touchscreen computer or as a touchpad connected to a computer and projector, replacing traditional blackboards or whiteboards. Despite the Nigerian government's commitment to integrating IWBs in classrooms, several challenges hinder the actualization of this policy, including inadequate infrastructure, electricity, internet connectivity, skilled manpower, and funding.

In most Nigerian schools, IWBs are not commonly utilized despite their potential to improve students' academic achievements. There is also a lack of awareness and utilization of IWBs among secondary school teachers, particularly in the Nnewi Education Zone of Anambra State. To address this gap, a study was conducted focusing on the awareness and use of IWBs among secondary school computer studies teachers in this region.

The study aimed to achieve three objectives, formulated three research questions, and tested one hypothesis at a 0.05 level of significance. A descriptive survey design was employed, involving 20 computer studies teachers from private and public secondary schools in the Nnewi Education Zone. Data were collected using a close-ended questionnaire designed by the researcher, and the reliability of the instrument was confirmed using Cronbach's Alpha. Four research assistants assisted in administering the questionnaire. Descriptive statistics, including weighted response average, mean, and standard deviation, were used to analyze the data and answer the research questions. An independent sample t-test was conducted to test the hypothesis at a 0.05 level of significance.

The findings revealed that while teachers are aware of the potential use of IWBs in teaching and learning computer studies, they do not actually use them. There was no significant difference in the awareness and use of IWBs between teachers in public and private secondary schools. The study concluded that while awareness of IWBs is present, actual usage is lacking. It recommended organizing seminars and workshops for secondary school computer studies teachers to plan and deliver lessons using IWBs effectively.

### 1.0 Introduction

Educational organizations and schools are increasingly recognizing the potential of new technologies for improving educational outcomes so they are constantly searching the best pieces of technologies which can deliver that promise. Thus, schools race to "inject" new technologies in classrooms as their role in education is growing exponentially (Painter, Whiting & Wolters, 2024). As education is growing to become a large competitive market worldwide especially public schools, private schools also, often conceive new technologies as means to promote themselves to the public. Recently, one of the rapidly adopted technologies by schools according to Kanchanachaya (2024) is the interactive whiteboard (IWB).

An interactive whiteboard (IWB), also known as interactive board, interactive display, interactive digital board or smart board, is a large interactive display board in the form factor of a whiteboard (Imoke, Ushe&Ofem,2024). It can either be a standalone touchscreen computer used independently to perform tasks and operations, or a connectable apparatus used as a touchpad to control computers from a projector. It is a display that reacts to input from a user or from other digital devices. An interactive whiteboard according to Zittce (2019) is a digital device that allows users to project files and manipulate them on a board's surface. An interactive whiteboard will only function when a computer, projector and LCD display are present. It digitize tasks and operations and can be used to share messages, present information and engage in collaborative brainstorming. IWBs are used in a



variety of settings, including classrooms at all levels of education, in corporate board rooms and work groups, in training rooms for professional sports coaching, in broadcasting studios, and others (Ifamuywa&Akinsola, 2018). Interactive whiteboards permit users to annotate documents, images and other content in real time.

The first decade of the 21st century witnessed the spread of IWBs to replace one of the main characteristics of the traditional classroom which is the black/whiteboards (Wall, Higgins & Smith, 2022). This technology is gaining much ground in schools as they can be used as a “traditional whiteboard, a large digital convergence facility or a highly sophisticated digital teaching hub” (Higgins, Beachamp& Miller, 2017). In addition, there has been a great deal of enthusiasm and hope that the new technology will provide classrooms with more vivid educational experiences. The enthusiasm has also been accompanied by hope that the new technology will be adopted rapidly by education systems, school principals, teachers, and students (Miller, Glover &Averis, 2023). Much of that hope counts on the built-in capabilities of this technology which encompass the capabilities of several other technologies including computers, the motion picture, television and audio recorders, video conferencing, access to the networked world, and the ready facility to integrate all manner of digital teaching tools (Levy, 2022)). Educational systems are therefore now employing the use of IWB in classrooms and this is seriously supported by the Nigerian government.

An observation was made by researchers that, over the years, the federal government of Nigeria has initiated or adopted many ICT related policies aimed at guiding the development of the sector and harnessing its power for national development (Khairnar, 2024). The reality of ICT convergence has not yet been reflected in Nigeria, where the institutions that regulate and/or develop the ICT sector still function as distinct actors in the industry, without much coordination.. Moreover, the Nigerian government provides basic infrastructure to the educational sector of the country in order to integrate ICT into primary, secondary and tertiary institutions. Furthermore, the Nigerian national ICT Policy on education categorically states that if the policy is fully implemented, it will effectively promote teaching and learning activities in the educational industry of the nation, in order for the Nigerian government to actualize the dream and aspiration of integrating ICT into the classroom. Similarly, the Nigerian government has stepped up effort to make ICT become an integral part of the educational system of the country and this effort echoes through its ICT policy on education. The policy has begun to be implemented and to an extent some universities and colleges are able to integrate some aspects of educational technology into classroom practice.

Despite governments’ commitment, it is observed that, there are many factors that are militating against the actualization of the policy at the school and classroom level. Some of the factors identified includes inadequate supply of infrastructure, electricity, internet connectivity, man-power skills as well as funding (Khairnar, 2024). Nigerian educational system has

succeeded in partial integration of Information and Communication Technology (ICT) despite the hindrance, Government on its part provided some infrastructural facilities such as computer laboratories (Khammani, 2023), internet connectivity (Khairnar, 2024). Nonetheless, certain ICT gadgets like IWB do not appear to be inclusive in the forms of ICT common in most public and private school classrooms despite its potential to improve students’ academic achievement. There appears also to be a poor awareness and utilization of IWB among secondary teachers and literature is not adept with the level of awareness and use of IWB among secondary school computer studies teachers especially in Nnewi Education Zone of Anambra state. The need arises therefore that empirical investigation be conducted to ascertain teachers’ awareness and use of IWB for teaching and learning computer studies in Nnewi Education Zone of Anambra state.

### 1.1 Statement of the Problem

The significance of using digital devices in the education system cannot be over emphasized. The roles it plays in the field of teaching and learning is now superseded the traditional instructional aid (Suman& Sinha, 2013), it gains increasing popularity around the globe. By and large, the acceptability of technology is far-reaching and yet its predicament in the present day educational policy of many developing countries like Nigeria, is still at stake. Despite the effort of the Nigerian government at Federal and State levels to provide ICT for use in the classroom, there is still the paucity of important and effective ICTs like the IWB in most public and private schools in Nigerian especially in Nnewi Education Zone of Nigeria. It is thought that teachers may not only be unaware of IWBs but that they may not have used in teaching and learning especially for computer oriented subjects like computer studies. Owing to lack of sufficient literature on the awareness of teachers and their use of IWB, a significant gap is identified that needs further investigation. Thus, the problem of the study posed as a question is; what is computer studies teachers’ awareness and use of IWB in secondary schools in Nnewi education Zone?

### 1.2 Purpose of the Study

The purpose of the study was to investigate secondary school teachers’ awareness and utilization of interactive whiteboard in teaching and learning of computer studies in Nnewi education zone of Anambra State. Specifically, the study investigated:

1. The extent of awareness of secondary school teachers of the use of Interactive White Board (IWB) in teaching and learning of computer studies.
2. The extent of use IWB by secondary school teachers for teaching and learning of computer studies.
3. Difference in the mean response rating of public and private secondary school teachers of their awareness and use of Interactive White Board (IWB) in teaching and learning of computer studies.

### 1.3 Research Questions

The following research questions guided the study:

1. What is the extent of awareness of secondary school teachers of the use of Interactive White Board (IWB) in teaching and learning of computer studies?
2. What is the extent of use IWB by secondary school teachers for teaching and learning of computer studies?
3. What is the difference in the mean response rating of public and private secondary school teachers on the extent of their awareness and use of Interactive White Board (IWB) in teaching and learning of computer studies?

### 1.4 Hypotheses

The following hypotheses were tested at 0.05 level of significance

1. There is no significant difference in the mean response rating of public and private secondary school teachers on the extent of their awareness and use of Interactive White Board (IWB) in teaching and learning of computer studies.

## 2.0 Methods

The design of this study was descriptive survey. According Nworgu (2015) survey research is one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. The area of this study was Nnewi Education Zone of Anambra state. The area for the study is Nnewi Education Zone which is made up of four local government areas namely: Nnewi North, Nnewi South, Ekwusigo and Ihala local government areas. The choice of this area is because Nnewi Zone is known for its technological adventures. The area was therefore chosen because it is hoped that such study as this will inform teachers and educators of the present situation of IWB in secondary school classroom and may inform educational practices and policies that could improve teaching and learning of computer studies in the zone. The population of the study consists of 179 senior secondary school teachers of computer studies in private and public secondary schools in Nnewi Education Zone of Anambra state (Source: Post Primary School Services Commission, PPSSC, Awka, 2024).

The sample for the study comprised of 20 teachers of computer studies in private and public secondary schools in Nnewi Education Zone. The sample was obtained using multi-stage sampling. First, purposive sampling was used to select five senior and five junior public secondary schools, along with five senior and five junior private secondary schools. The reason behind their selection was because they have functional computer laboratories and to ensure wide sampling distribution among public and private junior and senior secondary schools. Secondly, one computer studies teachers were selected from each schools using random sampling. The sample consisted of 13 female and 7 male computer studies teachers.

The instrument used for data collection was a close-ended questionnaire designed by the researcher. The questionnaire was titled: Secondary School Teachers' Awareness and Use of IWB in Teaching and Learning of Computer Studies (SSTAUIWBTLCS). The questionnaire had three sections. Section A was designed to generate demographic information from the teachers. Section B contained items constructed to generate information on the teachers' awareness of IWB in teaching and learning while section C was designed to generate information on the extent of use of IWB by the teachers. There were a total of 20 items; 10 each in sections B and C. The response pattern adopted for section B was four point rating scale of Very Much Aware (VMA), Much Aware (MA), Aware (A) and Unaware (U). Section C has also a four point response options as follows: Very Often (VO), Often (O), Seldom (S), Not at All (NA).

The initial draft of the instrument, objectives, research questions and hypotheses were given to two senior lecturer in the Faculty of Education, of University of Nigeria Nsukka for validation. They were expected to validate the content, structure, language and its relevance to the study. The experts after validating the instrument gave corrections based on the appropriateness of the language used in developing the instrument, content coverage and relevance of the instrument to the research question. Their suggestion and corrections were effected in the final copy of the instrument. The reliability of the instrument was determined using Cronbach's Alpha. The choice of the Cronbach's Alpha technique was because the instrument was polytomously scores. Consequently, the instrument was administered to 5 teachers in of computer studies in Aguata Education Zone which was not part of the study. The coefficient of internal consistency obtained for the sections B and C were 0.89 and 0.79 respectively; while the overall instrument has a coefficient of internal consistency of 0.72.

The instrument was administered to the respondents with the help of 4 research assistants briefed on how to administer the instrument. The respondents were given sufficient time to complete the questionnaire. To ensure that enough questionnaires are returned to meet the sample size determined for the study, the researcher administered the questionnaire directly on the teachers and collected back on the spot. The method of data analysis used was descriptive statistics of weighed response average, mean standard deviation which was used to answer the research questions while independent sample t-test was used to test the hypotheses at 0.05 level of significance. The criteria for the interpretation of the grand mean for question one was that grand mean ranging from 1.00 – 1.45 is Unaware, 1.50 – 2.45 indicated Aware, 2.50 – 3.45 indicated Much Aware and 3.50 – 4.00 indicated Very Much Aware while for question 2 grand mean ranging from 1.00 – 1.45 is Not at all, 1.50 – 2.45 indicated seldom, 2.50 – 3.45 indicated Often and 3.50 – 4.00 indicated Very Often. The decision rule was that where P-value was less than 0.05, the null hypotheses was rejected, otherwise the null hypotheses was not rejected.

### 3.0 Results

**Research Question 1:** What is the extent of awareness of secondary school teachers of the use of Interactive White Board (IWB) in teaching and learning of computer studies?

**Table 1:** Extent of Awareness of Secondary School Teachers on the use of Interactive White Board (IWB) in Teaching and Learning of Computer Studies

S/N	Item I am aware that...;	Mean	SD	Remark
1	Teachers use IWB to integrate various learning styles to enhance learning experience in computer studies	1.41	0.84	Unaware
2	Teachers use IWB to facilitate computer studies students' interaction with the learning materials	1.73	0.53	Unaware
3	Teachers use IWB to display various media that enrich computer studies learning	1.05	0.50	Unaware
4	Teacher use IWB to conduct out-of-class instructional delivery for computer studies classes	2.01	2.31	Unaware
5	Teachers use IWB to access various sources across the internet to support their computer studies lessons	1.44	0.46	Unaware
6	Teachers use IWB to integrate other technological accessories that further reduce the teaching work load for computer studies lessons	1.35	0.44	Unaware
7	Teachers use IWB to enhance classroom management during computer studies lessons	2.73	1.31	Aware
8	Teachers use IWB to gain and sustain students' attention during computer studies lessons	3.28	1.02	Aware
9	Teachers use IWB to administer class exercise during computer studies lessons	1.65	0.63	Unaware
10	Teachers use IWB to send assignments to computer studies students	2.21	1.13	Unaware
<b>GRAND MEAN</b>		<b>2.21</b>		<b>Aware</b>

Table 1 shows that the grand mean of 2.21 fall within the range of 1.50 – 2.45 which indicated that the teachers is aware of the use of Interactive White Board (IWB) in teaching and learning of computer studies.

**Research Question 2:** What is the extent of use IWB by secondary school teachers for teaching and learning of computer studies?

**Table 2:** Extent of Secondary School Teachers use of Interactive White Board (IWB) in Teaching and Learning of Computer Studies

S/N	Item	Mean	SD	Remark
1	I use IWB to integrate various learning styles to enhance learning experience in computer studies	1.05	0.84	Not at all
2	I use IWB to facilitate computer studies students' interaction with the learning materials	1.21	0.53	Not at all
3	I use IWB to display various media that enrich computer studies learning	1.07	0.50	Not at all
4	I use IWB to conduct out-of-class instructional delivery for computer studies classes	1.01	2.31	Not at all
5	I use IWB to access various sources across the internet to support their computer studies lessons	1.09	0.46	Not at all
6	I use IWB to integrate other technological accessories that further reduce the teaching work load for computer studies lessons	1.00	0.44	Not at all
7	I use IWB to enhance classroom management during computer studies lessons	1.00	1.31	Not at all
8	I use IWB to gain and sustain students' attention during computer studies lessons	1.00	1.02	Not at all
9	I use IWB to administer class exercise during computer studies lessons	1.00	0.63	Not at all
10	I use IWB to send assignments to computer studies students	1.00	1.13	Not at all

GRAND MEAN	1.04	Not at all
------------	------	------------

Table 2 shows that the grand mean of 1.04 fall within the range of 1.50 – 2.45 which indicated that the teachers do not all use Interactive White Board (IWB) in teaching and learning of computer studies.

**Research Question 3:** What is the difference in the mean response rating of private and public secondary school teachers on the extent of their awareness and use of Interactive White Board (IWB) in teaching and learning of computer studies?

**Table 3:** Mean Response Rating of Public and Private Secondary School Teachers on the Extent of their Awareness and use of Interactive White Board (IWB) in Teaching and Learning of Computer Studies

Variable	Gender	N	Mean	SD	Decision
Awareness	Public	10	2.01	1.08	Aware
	Private	10	2.41	0.92	Aware
Use	Public	10	1.00	1.21	Not at all
	Private	10	1.08	1.02	Not at all

Table 3 shows that although public and private teachers are aware of the uses of IWB in teaching and learning computer studies, they do not use it at all.

**Hypothesis 1:** There is no significant difference in the mean response rating of public and private secondary school teachers on the extent of their awareness and use of Interactive White Board (IWB) in teaching and learning of computer studies.

**Table 4:** Summary of Paired Sample T-test on Significance of Difference in the Mean Response Rating of Public and Private Secondary School Teachers on the Extent of their Awareness and Use of Interactive White Board (IWB) in Teaching and Learning of Computer Studies

		Paired Samples Test							
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Public - Private	-0.40	1.01	1.022	-2.753	1.318	.702	19	.485
Pair 1	Public - Private	-0.19	0.92	1.210	-1.923	2.897	.403	19	.688

Table 4 shows that the observed difference of 0.40 between the mean response rating of public and private secondary school teachers on the extent of their awareness of Interactive White Board (IWB) uses in teaching and learning of computer studies is not significant  $t(1, 19) = 0.702, P(0.485) > 0.05$ . Thus, the null hypothesis was not rejected. Therefore, there is no significant difference in the mean response rating of public and private secondary school teachers on the extent of their awareness of Interactive White Board (IWB) uses in teaching and learning of computer studies.

Table 4 also shows that the observed difference of 0.19 between the mean response rating of public and private secondary school teachers on the extent of their use of Interactive White Board (IWB) in teaching and learning of computer studies is not significant  $t(1, 19) = 0.403, P(0.688) > 0.05$ . Thus, the null hypothesis was not rejected. Therefore, there is no significant difference in the mean response rating of public and private secondary school teachers on the extent of their use of Interactive White Board (IWB) in teaching and learning of computer studies.

#### 4.0 Discussion of Findings

The findings of the study showed that secondary school teachers are aware of the use of IWB in teaching and learning of computer studies. They are mainly aware of the use of IWB to enhance classroom management and to gain students' attention as well as sustain it. The awareness of teachers on these two factors can be attributed to the fact that they often see how ICT can be used in presentations and how attention it garners from the audience and how it could sustain the audience's attention. With interactive tools, instead of always calling on the students who seem to always raise their hands, teachers can make sure everyone has a voice. The teacher could enter students' names ahead of time in a random name generator, then choose students as their names come up. The teacher can also use this tool to assign groups randomly for quick activities. Because today's young people are digital natives, digital whiteboard functionalities are easily adopted and are used by teachers to manage classroom and sustain students' attention.

When using IWB with a wireless pad and pen, teachers can control the interactive whiteboard from anywhere in the classroom, so there is no need to turn their back on the class as they teach. They can download interactive whiteboard apps to turn their iPad or other tablet into a remote controller. Students can draw or write on iPads using apps such as Ink2go or one from your manufacturer. With these tools that can be used to demonstrate understanding of computer studies problems, label parts of a computer or ask a question for the students and their classmates to answer, leaving them free to supervise and help individual students, classroom management becomes more efficient. These examples show how interactive whiteboards and free online lessons and apps can combine to make the modern, digital classroom a much more enjoyable and effective learning environment.

The findings of the study support the findings of Modu (2018) that teachers with prior ICT experience are aware of IWB and its use in teaching and learning. The findings of the study are also in line with the findings of Imoke, Ushe and Ofem (2024) that there was no difference in the awareness and use of IWB among research subjects.

## 5.0 Conclusion

The conclusion established from the findings of the study is that secondary school teachers in public and private secondary schools are aware of the use of IWB in teaching and learning of computer studies. They however, do not use IWB at all in teaching and learning.

## 6.0 Recommendations

The following recommendations are made based on the findings of the study:

1. The government should through the ministry of education and other private sector support secure and install within secondary school classrooms IWB for teaching and learning.
2. Seminars and workshop should be organized for secondary school computer studies teachers on how to plan their lessons using IWB and also to use it during instructional delivery.
3. Effort should be made by school administrators through government sponsorship and Parents Teachers Associations (PTA) to raise fund and sponsor for their schools the purchase and installation of IWB within the classrooms.

## References

1. Hamilton, A. (2024). Innovative teaching strategies for student-centered learning: Utilizing honey & mumford's learning styles. London: Routledge.
2. Higgins, S, Beachamp, G.& Miller, D. (2017). Reviewing the interactive whiteboards. *Learning Media and Technology*, 32(3), 213, 225. <https://doi.org/10.1080/17439880701511040>
3. Ifamuywa, S.A. & Akinsola, M. K. (2018). Improving senior secondary school students' attitude towards mathematics through self and co-

- operative instructional strategies. *International Journal of mathematical Education in science and Technology*, 39(5), 569-585. <https://doi.org/10.1080/00207390801986874>
4. Imoke, J.E., Ushe, B.C. & Ofem, B.E. (2024). Interactive/Smart whiteboard and student-teachers academic performance in educational technology at the University of Calabar, Nigeria. *European Journal of Contemporary Education and E-Learning*, 2(1), 170-176.
5. Kanchanachaya, N. (2024). *Development of a blended learning model based on creative problem solving principles using lateral thinking to enhance creative problem solving abilities for instructional media production of pre-service teachers*. Bangkok, Thailand: Chulalongkorn University.
6. Khairnar, C. M. (2024). Advance pedagogy: Innovative methods of teaching and learning. *International Journal of Information and Education Technology*, 5(11), 869-872.
7. Khammani, T. (2023). Qualifications framework for higher education: Teaching strategies. *The Journal of the Royal Institute of Thailand*, 35(2), 181-201.
8. Levy, D. (2022). Interactive whiteboard in learning and teaching in two Sheffield schools. A developmental Study. Sheffield department of information studies. University of Sheffield.
9. Miller, D., Glover, D.&Averis, D. (2023). Exposure the introduction of interactive whiteboard technology to secondary school mathematics teachers in training. Paper presented at CERMEZ. Third conference of the European society for research in mathematics Education Bateria, Italy.
10. Nworgu, B.G. (2015). *Educational research: Basic issues and methods*. Nsukka: University Trust Publishers.
11. Painter, D.D., Whiting, E., & Wolters, B. (2024). The use of an interactive whiteboard promoting interactive teaching and learning. *VSTE Journal*, 19(2), 31-40.
12. Wall, K., Higgins, S., & Smith, H. (2022). The visual leaps me understand the complicated things; pupils view of teaching with interactive whiteboards. *British Journal of Educational Technology*, 36(5), 867. <http://dx.doi.org/10.1111/j.1467-8535.2005.00508.x>
13. Zittce, F.J (2019). *Enhancing Native American mathematics learning: the use of smartboard generated virtual manipulatives for conceptual understanding*. Retrieved from [https://downloads.smarttech.com/media/research/international\\_rese](https://downloads.smarttech.com/media/research/international_rese)
14. Anusiuba O.I.A., Nweke N. M & Egbo, F. N.. (2019), "Improving Students' Achievement And Retention In Computer Studies Through The Use Of Computer-Assisted Tutorial Instructions", *International Journal of Innovative Research and*

Advanced Studies (IJIRAS), Vol. 6, (Issue 8), pp  
85-91

