



# Appraising the Availability, Accessibility, and Efficacy of Interactive Whiteboard for Instruction Amongst Lecturers in Public Tertiary Institutions in Sokoto State, Nigeria

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**Abstract:** The world is stirring faster into technological innovations. One can say teaching and learning to our everchanging from traditional/conventional classroom situations to electronic classrooms. There are many things one can see and say this classroom is an electronic classroom; the use of web 2.0 tools, video conferencing, google classroom, the use of social networks to impart knowledge and skills, and the use of an interactive whiteboard. This research on “appraising the availability, accessibility, and efficacy of Interactive Whiteboard for instruction amongst lecturers in public tertiary institutions in Sokoto State, Nigeria”, was led by three objectives and three research questions. The study used a descriptive cross-sectional survey research design. The researchers used the quantitative method for data collection. The total population of the study is 2,478. A Multistage (called clustering) sampling technique was employed to select the sample from the public tertiary institutions in Sokoto State. The total sample that was chosen is 136. The instrument used for data collection is adapted. The frequency and percentage were employed to analyze the respondents’ demographic information. To answer research questions one, two, and three descriptive statistics (frequencies and percentages) were used. The summary of the major findings is; there is no availability of IWB in the classrooms of public tertiary institutions in Sokoto State, Nigeria, the lecturers of public tertiary institutions in Sokoto State, Nigeria did not have access to IWB for teaching and learning, and the lecturers’ perception of the IWB level of efficacy in public tertiary institutions in Sokoto State, Nigeria for teaching and learning is poor.

**Keywords:** Availability, Accessibility, Efficacy, Interactive Whiteboard, Teaching and Learning

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## 1. Introduction

The world is moving faster into technological innovations. One can say teaching and learning to shift from traditional/conventional classroom situations to electronic classrooms. There are many things one can see and say this classroom is an electronic classroom; use of web 2.0 tools, video conferencing, google classroom, use of social networks to impart knowledge and skills, use of an interactive whiteboard, just to mention but a few. There are countless types of technology used in instruction which

include; calculators, laptop computers, interactive whiteboards, educational software, smartphones, smart response systems, social media, virtual reality devices, and audio-visual technology mention a few [11]. Interactive Whiteboard (IWB) is now regarded as real objects; it displays the real items as instructional media during the lesson as opposed to models or representations, real is extremely useful if such materials are readily available and easily displayed [21]. The Nigerian government has been trying to ensure that the educational system changes and meets the needs and aspirations of society. In her efforts to boost the education system in the country, the government

established Tertiary Education Trust Fund (TetFund) to improve tertiary education through training and retraining of personnel and provision of infrastructures in all public tertiary institutions with the inclusion of new technological innovations. The question to raise here is the IWB available, accessible, and self-efficacy for instruction amongst lecturers in public tertiary institutions in Sokoto State, Nigeria. There is a need for educational innovations in this era and it became paramount, there is no doubt a country's social, political and economic security will be contingent to a greater extent on the worth of its citizens' education: the emergence of transformation of information and the media, and increasing specialization on the part of organizations all call for high skilled profiles and levels of knowledge, today education systems are required to be both effective and efficient, or in order, to reach the goals set for them while making the best use of available resources [23].

Nigeria is called the giant of Africa; Nigeria has more than 500 indigenous languages with a population estimated at over 192 million [15]. The Hausas, Yorubas, and Igbos are the most prominent ethnic groups in the country. Hausas are the people that dominated the Northern part of the country. The Northern part is subdivided into three namely: North-West, North-East, and North-Central. Specifically, in the North-West there are seven states; Jigawa State, Kaduna State, Kano State, Katsina State, Kebbi State, Sokoto State, and Zamfara State. The various state governments in North-west Nigeria are committed to the improvement of education in their areas through the provision of various technological innovation tools. The notable effort of the Sokoto states government education is in stripe with the proclamation encompassed in the National Policy on Education [9], which says education is the key to national development.

The use of technological innovation tools in teaching and learning is aimed at making things easy and stress-free for both teachers and learners. An IWB, also known as an interactive board or smart board, is a large interactive display board in form of a whiteboard. It can either be an impartial touchscreen computer used independently to perform tasks and operations, or a connectable gadget used as a touchpad to control computers from a projector. They are used in a multiplicity of settings, including classrooms at all levels of education, corporate board rooms and work groups, training rooms for professional sports coaching, broadcasting studios, and others [12]. The IWB technology combines a large, touch-sensitive electronic board with a data projector, specialized software, and a computer. The board displays the projected computer image and allows direct input via finger or stylus [13]. The software provides a variety of functions, including those that replicate non-digital technologies such as flipcharts, dry-wipe boards, overhead projectors, slide projectors, and video players [12]. The IWB is particularly well-suited for supporting a dialogic pedagogy because it expands the possible modes of classroom dialogue beyond talk and gesture. New dialogues can evolve around digital artefacts: images, texts, and other digital objects that teachers and learners iteratively manipulate and develop through

collective scrutiny and collaborative activity [12]. The whiteboard can be used to deliver instruction in a variety of ways that may be categorized based on three modalities of learning namely: visual learning; auditory learning and tactile learning. Each of these is explained.

First, visual learning with the use of a whiteboard can range from the use of text and pictures to the use of animation and video. Second, auditory learning deals with activities that involve the use of words orally for pronunciation, and speeches. and poems, the use of auditory learning might also include listening to sounds or music. Third, tactile learning allows students to physically interact with the board and can assist with meeting the needs of tactile learners. Numerous software programs can be used that involve user contact with the whiteboard. The extent to which each of these three modalities is incorporated into a lesson may determine the way students are engaged in the learning process and, thus, they are motivated to learn [4]. More so, the software for the IWB allows a range of activities, including those that can be used without switching IWB on, for instance, projecting presentations and short films, and writing and erasing the board. However, there are activities unique to this technology (IBW): drag and drop an item on the board that can move in various directions, hide and reveal-an items located on top of others that can be removed, highlighting-a clear colour that can be placed on top of writing, animation-items can be spun, change the size, and move in a pre-determined direction, storage and recall: unlimited storage and quick recall of material and feedback-when touching a particular item, there is visual or auditory feedback [20]. IWB has the potential to capture and hold students' attention more than other classroom resources, resulting in enhanced student engagement and reduced problem behaviours that can interfere with learning [1]. Students taught with IWB performed better than the control group. Also, high achievers performed better than medium and low achievers respectively and were also found to be gender friendly. It was stated students that who experienced the interactive whiteboard performed significantly better [10].

According to market research by Future Source Consulting, the IWB industry was expected to reach sales of US\$1 billion worldwide by 2008; one of every seven classrooms in the world was expected to feature an interactive whiteboard by 2011. In 2004, 26% of British primary classrooms had interactive whiteboards. The Becta Harnessing Technology Schools Survey 2007 indicated that 98% of secondary and 100% of primary schools had IWBs. By 2008, the average number of interactive whiteboards rose in both primary schools 18 compared with just over six in 2005, and eight in the 2007 survey and secondary schools 38, compared with 18 in 2005 and 22 in 2007. The availability and accessibility of technology along with the 21<sup>st</sup>-century services that frequently convoy technological tools use have directed many school structures and overseers to decree technology integration in classrooms with students at all levels [8]. Now, the aforementioned statements mean among seven

classrooms, one should have IWB in each of the public tertiary institutions in Sokoto State, Nigeria. This study is aimed to investigate the availability, accessibility, and efficacy of Interactive Whiteboards (IWB) for instruction amongst lecturers in public tertiary institutions in Sokoto State, Nigeria.

### **1.1. Statement of the Problems**

The world is moving from analogue to digital and this changes the entire system of teaching and learning. Teaching and learning became simple, interesting, enjoyable, effective, concrete and permanent to the learners' skills/knowledge acquired. IWB is one of the technologies that transform classroom activities and teachers' roles, the chalkboard has been developed into an interactive electronic board, a learner can see and feel his achievement at the same time through finger touch and he can write, draw, drag an object, manipulate a text or shape something [19]. Computers, smart boards data projectors, and digital cameras, just to mention but a few, are not adequately available and are being much less utilized [27]. Therefore, they are not part of classroom technology in most tertiary institutions in Nigeria, thus, the lecture method and course materials/handouts continue to dominate classroom activities. This is an indication that the lecturers are still lagging behind the trend of changes in the world of ICTs. Observations and field notes, made in several schools across the last five years, including the numerous conversations with classroom teachers, principals, school staff intimately involved in promoting the use of IWBs, as well as staff that are not so sure about this new ICT innovation [5]. The challenge here is that there may be insufficient academic research on IWB resources available for instruction at public tertiary institutions in Sokoto State, Nigeria. Without investigation, the state will continue producing analogue teachers that cannot use and manipulate technology for teaching and learning. Ignorance or negligence of IWB can cause a lot of harm to the development of education as such in the future many universities may lose accreditation and the nation may be in trouble in all aspects of life. And IWB may be available at every public tertiary institution in Sokoto State, Nigeria, the issue is being they are accessible/utilised by lecturers in public tertiary institutions in Sokoto State, Nigeria for teaching and learning activities. Sometimes one may be opportune to have something but one cannot get access/utilize it for one reason or the other. The government may spend a huge amount of money to provide IWB for lecturers to teach but they may find it difficult to use/manipulate.

Despite lecturers growing dependence on technology, many lecturers still reported that they lack the necessary confidence to integrate the available technology into their instructions [24]. The problem here is lecturers may be battling with how to use the technology available for them to teach, because they may be lacking the knowledge and skills to use them. Lecturers need practical answers to the

increasing challenges imposed by new technologies such as IWB to the teaching profession [19]. In addition, there is not enough academic study on the "availability, accessibility and efficacy of IBW for instructions amongst lecturers in public tertiary institutions in Sokoto State, Nigeria".

Therefore, there are three underlining factors; availability, accessibility, and efficacy of lecturers' regard to the use of IWB for teaching and learning in public tertiary institutions in Sokoto State, Nigeria. The study covered all public tertiary institutions in Sokoto State but delimited to the College of Agriculture Wurno (CAW), College of Legal and Islamic Studies Wamakko (CLISW), College of Nursing Sciences Sokoto (CNSS), School of Nursing Sciences Tambuwal (SNST), Shehu Shagari College of Education Sokoto (SSCOES), Sokoto State University (SSU) and Sultan Abdulrahman School of Health Technology Gwadabawa (SASHTG). The reason for the delimitation is due to the time constraint and logistics problems.

### **1.2. Objectives of the Study**

The objectives of this study are to:

- 1) Investigate the availability of an Interactive Whiteboard for teaching and learning amongst the lecturers in public tertiary institutions in Sokoto State, Nigeria.
- 2) Find out the accessibility of the Interactive Whiteboard for teaching and learning amongst lecturers in public tertiary institutions in Sokoto State, Nigeria.
- 3) Examine the extent to which lecturers' perceived efficacy of Interactive Whiteboard for teaching and learning among lecturers in public tertiary institutions in Sokoto State, Nigeria.

### **1.3. Research Questions**

This research attempts to answer the following questions:

- 1) What is the level of availability of Interactive whiteboards in the classrooms in public tertiary institutions in Sokoto State, Nigeria for teaching and learning?
- 2) What is the level of lecturers of public tertiary institutions in Sokoto State, Nigeria accessibility to Interactive Whiteboard for teaching and learning?
- 3) What is the lecturers' perception of Interactive Whiteboard efficacy to use in public tertiary institutions in Sokoto State, Nigeria for teaching and learning?

## **2. Literature Review**

Literature is the systematic review of existing knowledge that is authorized by a different scholar that can promote the quality of education. This study reviewed the related literature based on the variables of this research. The IWB is considered particularly useful by teachers in supporting visualization to assist in teaching difficult concepts or demonstrating skills, the graphical and dynamic representations. Indeed, audio or video helps to make complex concepts and processes more explicit, concrete and

transparent, this offers opportunities to check understanding and supply clarification, teachers of course use traditional resources, as well as talk, gaze and gesture, alongside the IWB [12], they ascertain this in their paper reviewed. Research has shown the potential benefits of an interactive whiteboard for all students and specifically for students with special needs. It can be noted that an essential benefit of an interactive whiteboard is increased engagement due to the interactive nature of the technology. Hence, increased engagement is a leading factor in student participation in teaching and learning [2], it is proposal paper. IWB can provide both a tool and an environment that can encourage the creation of a shared dialogic space within which co-constructed knowledge-building can take place. However, this only occurs where there is active support from the teacher for collaborative, dialogic activity in the classroom and where the teacher can devise tasks that use board affordances to promote active learning [18], he affirmed this in his theoretical paper.

There is inadequate IWB for instruction in the faculties [17], a questionnaire was used to collect data in this survey research. Smart boards are not adequately available and are not sufficiently utilized, therefore they are not part of classroom technology in most tertiary institutions in Nigeria. Thus, the lecture method and course materials/handouts continue to dominate classroom activities. This is an indication that the lecturers are still lagging behind the trend of changes in the world of ICTs [27], a survey research and questionnaire served as an instrument for data collection. Observations and field notes, made in several schools across the last five years, including the numerous conversations with classroom teachers, principals, the school staff intimately involved in promoting the use of IWBs, as well as staff that are not so sure about this new ICT innovation [5]. Smart technologies have the potential to transform educational practices, as it endeavours to provide students with a quality education that matches the best global standards, and simultaneously recasts itself into an innovative, efficient and adaptive economy that can compete in the global world of the 21st century. Nevertheless, the availability of technology in the classrooms does not necessarily translate into the effective use of the tools to enhance learning [25], their study adopts a mixed methods design that employed interviews, observations and a questionnaire to obtain data. IWB is not being accessible and utilized by most instructors [3], this research presents a case study. There is no significant relationship between teacher self-efficacy and the ability to integrate technology within the classroom [24], survey research and a questionnaire served as an instrument for data collection. The Successful utilization of digital technology depends not just upon sufficient access to equipment, tools and resources, but also on the availability of sufficient training, knowledge, and support networks and providing teachers with this support will allow them to understand the benefits and applications of digital technologies and enable them to use digital technologies effectively [13].

Current technology use is determined by teachers' technology self-efficacy and knowledge of technology integration within the curriculum [8], the explanatory sequential mixed method design was used to investigate teachers' and students' technology self-efficacy toward technology usage as they affect technology implementation in the classroom. Teachers reported high levels of general ICT self-efficacy but low levels of self-efficacy with particular features and tools of the IWB and they allowed learners to use the IWB and remained positive about the potential benefit of using IWBs to increase learner participation, engagement and motivation [13], data was collected with the used of the questionnaire. Teachers who participate in well-designed professional development are likely to build technology self-efficacy and technological, pedagogical, and content knowledge [7], mixed-methods and design-based were used for the study. Lecturers are facing difficulties while using IWB for teaching and they need operational skills [24].

### 3. Summary of Reviewed Literature

The literature reviewed so far manifested some of the gaps which are inconsistency findings regarding the availability of IWB for teaching and learning. For instance, some of the researchers stated that there is the availability of IWB, while others had contrary findings. The review indicated that many researchers focused on the ability of lecturers/teachers the use technology in the classrooms without looking at the availability, accessibility and efficacy of the technological resources used in the class or schools in general. In all the literature reviewed, there is an insufficient study that investigated the availability, accessibility and efficacy of IWB for instructions amongst lecturers in tertiary institutions in Sokoto State, Nigeria. However, most of the reviewed literature focused on the use of IWB, but there is a need to find out whether the technology is available or not, and if it is available, does the technology accessible for use? Sometimes, technology may be available but may not be accessible, and the technology may be available and accessible but one may not be able to use it for teaching since it may be difficult to handle. So, there is a need for research that would find out the availability, accessibility and efficacy of IWB for instructions among lecturers in tertiary institutions in Sokoto State, Nigeria.

IWB is useful to teachers and learners for teaching and learning [2, 5, 12]. It could be so if IWB is supported [18].

IWB is adequately not available for instructions [17, 27]. The availability of IWB does not necessarily translate into the effective use of the tool to enhance learning [25]. IWB must be available to enhance teaching and learning [14]. IWB is not being accessible and utilized by most instructors [24, 3].

A low level of self-efficacy affected the use of IWB for learning [13]. Lecturers are facing difficulties while using IWB [22]. Technological tools are well designed for use with hitches-free [7].

## 4. Methodology

A Descriptive cross-sectional survey research design was used in this study. The selection of this design allowed the researcher to collect a sample from a large group based on the opinion and perceptions of people and subject the data to analysis. This is also described as a group of people or items to be studied by collecting and analyzing data from a reasonable number of respondents or items to be considered representative of the entire group. The design allowed the

researchers to collect data from the respondents by using questionnaires to know their opinion and perception, consequently, the data were subjected to statistical analysis [27].

The population of the study comprised lecturers in public tertiary institutions in Sokoto State, Nigeria. A total of Two thousand four hundred and seventy-eight (2,478) lecturers are teaching in the sixteen tertiary institutions in Sokoto State, Nigeria. The details about the names of institutions and the population of the lecturers are presented in Table 1 below:

*Table 1. Name of Institutions and Population of the Study.*

S/N	Name of the Institutions	Population
1	College of Agriculture Wurno	38
2	College of Legal and Islamic Studies Wamakko	34
3	College of Nursing Sciences Sokoto	69
4	Community Health Officers Training Prog. (CHOTP) UDUTH	10
5	Post Basic Midwifery (PBM) UDUTH	12
6	School of Health Information Management (SHIM) UDUTH	11
7	School of Nursing (SON) UDUTH	22
8	School of Nursing Sciences Tambuwal	48
9	School of Psychiatry Nursing Federal Nero Psychiatry Kware	15
10	School of Post-Basic Pediatric Nursing (SPBPN) UDUTH	6
11	School of Post-Basic Pre-Operative Nursing (SPBPN) UDUTH	5
12	Shehu Shagari College of Education Sokoto	382
13	Sokoto State University	235
14	Sultan Abdulrahman School of Health Technology Gwadabawa	104
15	Umaru Ali Shinkafi Polytechnic Sokoto	233
16	Usmanu Danfodiyo University Sokoto	1254
	Total	2478

Source: Administration Office of each Public Tertiary Institution in Sokoto State, Nigeria (2022).

A Multistage (called clustering) sampling technique was employed to select the sample from the public tertiary institutions in Sokoto State. Cluster sampling is ideal when it is impossible or impractical to compile a list of the elements composing the population [6]. The selected are to participate and represent the whole. The public tertiary institutions in Sokoto State that were selected as per the population are the College of Agriculture Wurno (CAW), College of Legal and Islamic Studies Wamakko (CLISW), College of Nursing Sciences Sokoto (CNSS), School of Nursing Sciences Tambuwal (SNST),

Shehu Shagari College of Education Sokoto (SSCOES), Sokoto State University (SSU) and Sultan Abdulrahman School of Health Technology Gwadabawa (SASHTG). The population of each institution listed above is 38, 34, 69, 48, 382, 235 and 104 respectively. The rationale behind the sampling is due to the time and logistics constrain. However, the total sample is 136, which is in line with the Raosoft sample size calculator. Raosoft is software programmed to help to determine sample size. The name of institutions, population and sample size are presented in Table 2.

*Table 2. Name of institutions, population and sample size for quantitative.*

S/N	College of Education	Population	Sample Size
1.	College of Agriculture Wurno	38	1
2.	College of Legal and Islamic Studies Wamakko	34	1
3.	College of Nursing Sciences Sokoto	69	4
4.	School of Nursing Sciences Tambuwal	48	2
5.	Shehu Shagari College of Education Sokoto	382	81
6.	Sokoto State University	235	38
7.	Sultan Abdulrahman School of Health Technology Gwadabawa	104	9
	Total	910	136

The reason behind the selection of CAW, CLISW, CNSS, SNST, SSCOES, SSU and SASHTG is due to the time factor and logistics problem.

A structured questionnaire was used to collect data in this study. The questionnaire was adopted in this study. The questionnaire that was adopted is [26], lecturers' awareness, readiness and self-efficacy of using podcasts for teaching in

tertiary institutions in Niger State, Nigeria questionnaire and [16], pre-service teachers' perception of the use of e-learning during the covid-19 pandemic in colleges of education in North-west, Nigeria questionnaire. The reason for adopting the questionnaire is they are all based on emerging tools. The questionnaire has two parts namely; parts A and B. These two parts make one single instrument. Part A is for the

demographic data of the respondents, while part B contained items based on the availability, accessibility, and efficacy of IWB for instruction amongst lecturers in public tertiary institutions in Sokoto State, Nigeria. In Part A, the respondents will tick (✓) the appropriate answer in the spaces provided. In Part B, the respondents will tick (✓) the appropriate option; yes or no. The respondents are expected to give accurate personal opinions on the items.

## 5. Data Analysis

Biodata of the respondents amongst lecturers in public tertiary institutions in Sokoto State, Nigeria was presented. Henceforward, frequency and percentage were used to analyze the respondents' bio data on gender and institutions. A descriptive analysis of respondents based on gender is shown in Table 3.

*Table 3. Frequency Distribution of Gender.*

Gender	Frequency	Percentage (%)
a. Male	89	65%
b. Female	47	35%
Total:	136	100%

Table 3 confirmed that 89 (65%) of respondents were male while 47 (35%) were female. This shows that male lecturers

were more than female lecturers in public tertiary institutions in Sokoto State, Nigeria.

A descriptive analysis of respondents based on institutions is shown in Table 4.

*Table 4. Frequency Distribution of Respondents' Names of Institutions.*

Name of Institution	Frequency	Percentage (%)
CAW	1	1%
CLISW	1	1%
CNSS	4	3%
SNST	2	1%
SSCOES	81	59%
SSU	38	28%
SASHTG	9	7%
Total:	136	100%

Concerning the institutions' frequency distribution, 1 (1%), 1 (1%), 4 (3%), 2 (1%), 81 (59%), 38 (28%), 9 (7%), for CAW, CLISW, CNSS, SNST, SSCOES, SSU, and SASHTG, respectively. Table 4 shows that respondents 81 (59) from SSCOES were the majority.

Research Question One: What is the level of availability of Interactive whiteboards in the classrooms in public tertiary institutions in Sokoto State, Nigeria for teaching and learning?

This research question is answered using frequency and percentage. A summary of the analysis is presented in Table 5.

*Table 5. Level of Availability of IWB.*

S/N	Items	No	Yes
1)	Internet services provided by public tertiary institutions are adequately available.	136 (100%)	0 (0%)
2)	Internet services provided by public tertiary institutions are fast.	126 (93%)	10 (7%)
3)	Internet services provided by public tertiary institutions are reliable.	136 (100%)	0 (0%)
4)	Lecturers can easily get access to an IWB in the ICT Centre within public tertiary institutions.	136 (100%)	0 (0%)
5)	Lecturers can easily get access to an IWB in all classrooms within public tertiary institutions.	136 (100%)	0 (0%)
6)	IWB are available in all public tertiary institutions.	136 (100%)	0 (0%)
7)	Public tertiary institutions adequately provide podcasts for different subjects/topics online.	136 (100%)	0 (0%)
	Cumulative Percentage	99%	1%

Table 5 exposed that the level of availability of IWB in the classrooms in public tertiary institutions in Sokoto State, Nigeria for teaching and learning is poor because 99% is greater than 1% of the respondents.

Research Question Two: What is the level of lecturers of

public tertiary institutions in Sokoto State, Nigeria accessibility to Interactive Whiteboard for teaching and learning?

This research question is answered using frequency and percentage. A summary of the analysis is presented in Table 6.

*Table 6. Accessibility of IWB.*

S/N	Items	No	Yes
1)	IWB are available in every class	136 (100%)	0 (0%)
2)	I can use IWB any time I wish	136 (100%)	0 (0%)
3)	The network is available every time	136 (100%)	0 (0%)
4)	Electricity is available for use of IWB during my lectures	136 (100%)	0 (0%)
5)	75 per cent of my lectures I did them with the use of IWB	136 (100%)	0 (0%)
6)	Educational materials could be accessed from public tertiary institutions' websites anytime	136 (100%)	0 (0%)
7)	I can download podcasts/vodcasts and play them for my students	136 (100%)	0 (0%)
	Cumulative Percentage	100%	0%

Table 6 confirmed that 100% of the respondents did not have access to IWB for teaching and learning, this indicated that lecturers of public tertiary institutions in Sokoto State, Nigeria are not accessing IWB.

Research Question Three: What is the lecturers' perception of Interactive Whiteboard efficacy to use in public tertiary institutions in Sokoto State, Nigeria for teaching and learning?

This research question is answered using frequency and

percentage. A summary of the analysis is presented in Table 7.

*Table 7. Perception of IWB efficacy.*

S/N	Items	No	Yes
1)	Can you install software via the Internet through IWB?	33 (24%)	103 (76%)
2)	Can you use the IWB tools Toolbar for selecting the volume adjustment, zooming and time shifting of audio, video or audio-visual?	5 (4%)	131 (96%)
3)	Can you adjust IWB settings using the main control panel?	103 (76%)	33 (24%)
4)	I Can use IBW to record, play and pause recording material?	133 (98%)	3 (2%)
5)	Can you use editing tools such as Cut, Copy, Paste, Trim, Undo, Redo, and zoom in and out with the use of IWB?	131 (96%)	5 (4%)
6)	Can you copy/download audio, audio-visual or pictures from CD or DVD and the Internet and insert or project them through IWB?	133 (98%)	3 (2%)
7)	Can you insert/upload the recorded materials to the IWB, or the internet or send them to any removable tool?	133 (98%)	3 (2%)
	Cumulative Percentage	71%	29%

Table 7 acknowledged that 71% of the respondents' level of efficacy of IWB is not encouraging, is only respondent 29% of the respondents can use IWB hitch free while operating. The majority of the respondents (71%), show that lecturers' perception of IWB efficacy in public tertiary institutions in Sokoto State, Nigeria for teaching and learning is poor.

## 6. Results

The subsequent findings of the research are:

- 1) There is no availability of IWB in the classrooms in public tertiary institutions in Sokoto State, Nigeria.
- 2) The lecturers of public tertiary institutions in Sokoto State, Nigeria did not have access to IWB for teaching and learning.
- 3) The lecturers' perception of the IWB level of efficacy in public tertiary institutions in Sokoto State, Nigeria for teaching and learning is poor.

## 7. Discussion

The outcome of the research shows that there is no availability of IWB in the classrooms of public tertiary institutions in Sokoto State, Nigeria. This outcome is the same as earlier studies that showed IWB is adequately not available for instructions ([17, 27]).

The result of this study avowed those lecturers of public tertiary institutions in Sokoto State, Nigeria did not have access to IWB for teaching and learning. This outcome is in link with that of [24].

On efficacy, [22] revealed that lecturers are facing difficulties while using IWB for training and learning which is in stripe with this research.

## 8. Conclusion

The technological resource has penetrated all human endeavours but the result of this research shows that there is no availability of IWB in the classrooms of public tertiary institutions in Sokoto State, Nigeria, the lecturers of public tertiary institutions in Sokoto State, Nigeria did not have access to IWB for teaching and learning, and the lecturers' perception of the IWB level of efficacy in public tertiary

institutions in Sokoto State, Nigeria for teaching and learning is poor. Based on these results we must have somewhere to start so that we can face the challenges and compete with the developed countries around the globe.

## 9. Recommendations

The commendations were pinched out of the investigation results which are as follows:

- 1) Local, State, and Federal Governments should join hands in the provision of all necessities that will fit the challenges of the 21<sup>st</sup> century.
- 2) Government should afford adequate electricity to enable lecturers to use IWB regularly for their teaching.
- 3) Government should offer free access to networks in each state of the federation so that lecturers can easily get access to IWB resources.
- 4) Tertiary institutions should inspire their lecturers on how to use IWB for instructional delivery.

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