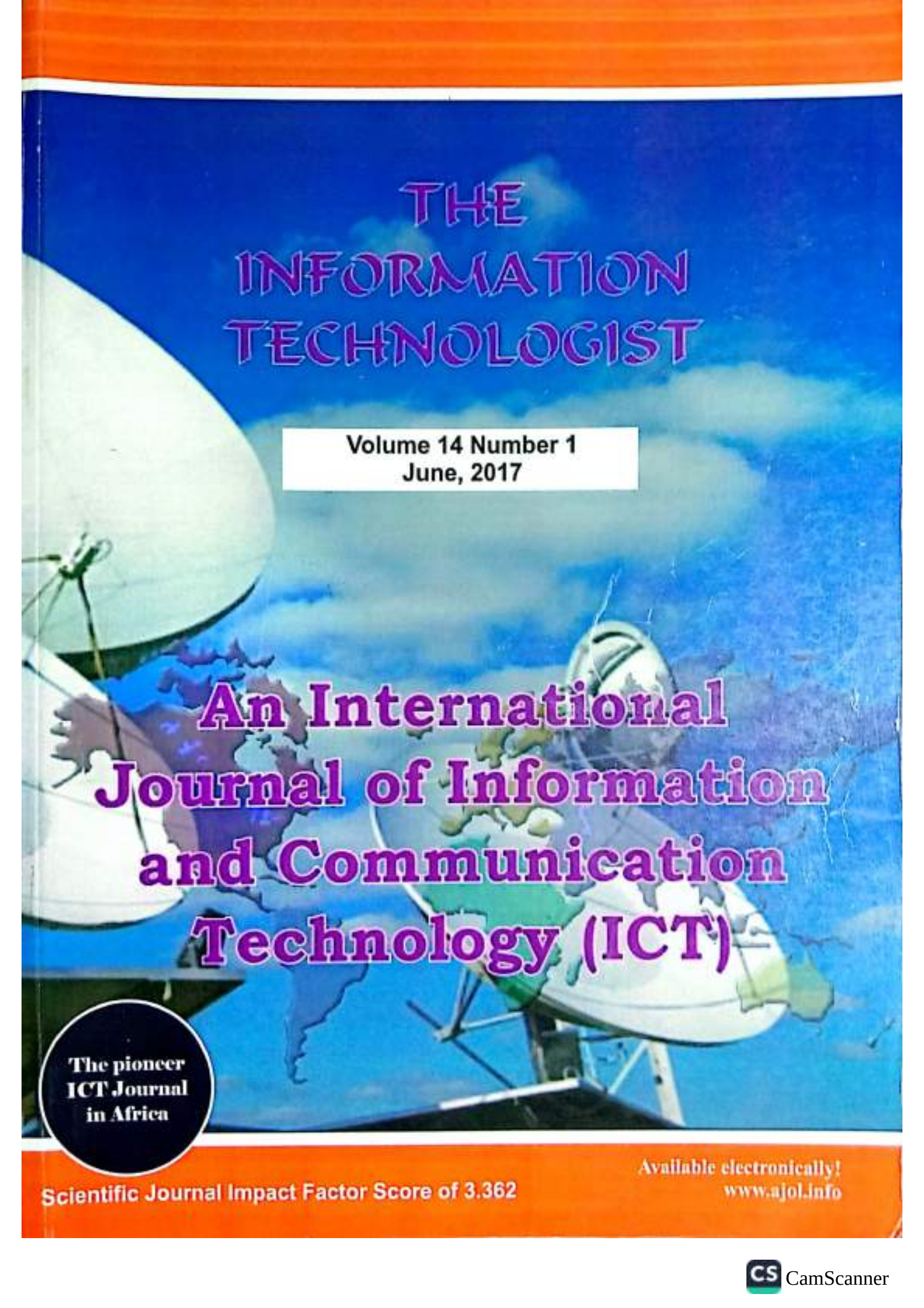




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USAGE ANALYSIS OF INTERACTIVE WHITE BOARD AMONG UNDERGRADUATE STUDENTS AT THE UNIVERSITY OF ILORIN, NIGERIA

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Abstract

The study examined usage analysis of interactive whiteboard by undergraduate students at the University of Ilorin, Nigeria. A total of 500 students selected from 15 faculties through simple random sampling technique represent the sample. The study adopted a survey approach using questionnaire to gather data from the respondents. Five research questions were developed and answered. The results revealed that the IWB is available to the undergraduate students as a platform for teaching and learning. Undergraduate students in the study are moderately satisfied with IWB, while factors identified as challenges to IWB includes the difficulty of access, reduction in control over learning and monitoring process, lack of proficiency, change in working habit and the different in the classroom organization. The study concluded based on these results that IWB is veritable tool that can enhance teaching and learning and capable of taking it to the next level if the university can invest more on it in terms of making the platform available in all the lecture rooms in the university.

Keywords: *Interactive, white, board, Smart, Learning, technology, Undergraduate, students, University*

Introduction

An interactive whiteboard (IWB) is an instructional tool that allows computer images to be displayed on to a board using a digital projector. The instructor can then manipulate the elements on the board by using his finger as a mouse, directly on the screen. Items can be dragged, clicked and copied and the lecturer can handwrite notes, which can be transformed into text and saved.

IWB is a powerful tool in the classroom adding interactivity and collaboration, allowing the integration of media content into the lecture and supporting collaborative learning. Using IWB innovatively can create a wide range of learning opportunities (BBC Active, 2010). However, in many environments they are not being used to their full potential, and in many cases IWB is used as glorified blackboards.

This type of whiteboard is now commonplace in schools in the U.K, America and other developed countries, however; universities have been slower to adopt this technology. IWBs were originally developed for use in business to demonstrate concepts and record meetings. However, they are extremely flexible tool which can be used with both the youngest primary school children and university graduates. An interactive whiteboard can be a cost saver as this technology demonstrates how one computer can provide learning stimuli for a whole classroom (Sambyal, & Gupta, 2014). This is more cost effective than equipping an entire IT room, or every student with a laptop.

Educational institutions have tried to provide students better learning environments by equipping them with the latest technology. This effort has encouraged instructors to use various assistive technologies such as computers

and the Internet in their classrooms especially over the last decade; this process is called integration of information and communication technologies (ICT) (Hsu, 2010). As a part of the ICT integration process, the interactive whiteboard(IWB) has been one technology most invested in especially by European countries such as England, Spain, and Turkey (Holmes, 2009; Türel, 2010). As at 2010, England has the highest IWB penetration rate (73%) in the world and many countries including Denmark (50%) and the USA (35%) have substantially increased IWB rates in classrooms; however, the average rate for Asia is still lower than 2% according to a recent research report (McIntyre- Brown, 2011), while that rate for Africa is not even known.

IWB's promising benefits to learning and instruction have led to its increased popularity and attractiveness as expressed by a number of researchers (Beauchamp & Parkinson, 2005; Smith, Higgins, Wall, & Miller, 2005; Slay, Siebörger, & Hodgkinson-Williams, 2008). It is asserted that IWBs can enhance the functionality of existing ICT such as computers and projectors by adding interactivity to these media that make it distinct from traditional PowerPoint Presentations (Hall & Higgins, 2005; Smith et al., 2005; Torff & Tirotta, 2010). Considering the possible advantages of IWBs, teachers can enrich their instructions with various instructional strategies and techniques and, therefore, increase students' attention, motivation, participation, and collaboration by means of an IWB (Hall & Higgins, 2005; Glover, Miller, Averis, & Door, 2007).

Although researchers strongly emphasize the positive effects of this technology when appropriately integrated into classrooms, the true success of IWBs depends on how they have been used by teachers in a learning context. Teachers

report that they have used IWBs through appropriate instructional strategies and resources, and above all, learned to incorporate the IWB with their course content. Hence, researchers, who have attempted to evaluate IWB use, have relied on perceptions of teachers as the main data source to determine the effectiveness of this technology in school settings (Slay, Siebörger, & Hodgkinson-Williams, 2008).

Many studies have been conducted on the effects of using an interactive whiteboard in classrooms. However, many of these studies have been conducted in foreign countries where there are advance technologies (Beauchamp & Parkinson, 2008; Gillen, Staarman, Littleton, Mercer & Twiner, 2007). Conducting similar research from the developing countries especially in the African context is considered to be highly germane. This is because there is currently no data on the penetration rate of IWBs in Africa. IWBs are becoming more and more common place in today's classrooms; therefore research on students' perceptions of it is necessary. Researching a particular grade level will be beneficial since experiences may vary across different grade levels. The University of Ilorin, Nigeria as part of its innovation to make the university a peculiar center for learning and academic excellence installed IWB to better facilitate her teaching, learning and research in 2014. However, it is important to determine the usage analysis of this technology from the perspective of the huge users (the students) so as to be able to project into the future academic activities of the university. Currently, limited studies are available that directly focused on the use of IWB particularly in Nigeria and in the context of University of Ilorin in particular. It is against these backgrounds that, this study investigated the usage

analysis of IWB amongst undergraduate students of University of Ilorin.

Objective of the study

The broad objective of the study was to examine the usage analysis of interactive whiteboard among University of Ilorin.

1. Find out how undergraduate students perceived the use of interactive whiteboard for teaching and learning.
2. Examine the likes and dislikes of undergraduate students about the use of interactive whiteboard for teaching and learning at the university of Ilorin.
3. Determine the perception of the undergraduate students on the availability of the interactive whiteboard for teaching and learning.
3. Find out the level of satisfaction of undergraduate students towards the use of interactive whiteboard for teaching and learning.
4. Identify the problem students encounter during the use of interactive whiteboards for their teaching and learning.

Research questions

In order to achieve the objectives of the study, the following research questions were answered.

1. What is the undergraduate students' perception of the usefulness of interactive whiteboard for teaching and learning?
2. What are the likes and dislikes of undergraduate students about the use of interactive whiteboard for teaching and learning at the University of Ilorin?
3. What is the perception of the undergraduate students on the availability of the interactive whiteboard for teaching and learning?
4. What is the level of satisfaction of undergraduate students towards the use of interactive whiteboard for teaching and learning?

5. What are the problem students encounters during the use of interactive whiteboards for teaching and learning?

Literature Review

Interactive Whiteboard

According to Shi, Chen and Tsai (2012), an interactive whiteboard (IWB) is a touch-sensitive board, linked to a computer and a digital projector. The computer can be commanded by touching the board, directly also with a particular pen. The projector can then show images from the computer on the board. Bell (2002) explained that interactive applications are in demand for educators who want to involve their students in learning with technology. The electronic interactive whiteboard is a device that combines both of these attributes; offering shared learning experiences for large or small groups, as well as for distance learning. Among the possible applications are (Lin, 2010): using web-based teaching materials in whole-class teaching, playing video clips to help students understanding concepts, displaying a piece of software, presenting students' work to others in the classroom, creating digital flipcharts, manipulating text and practicing handwriting, saving notes recorded on the board in the cause of future use, and quick and seamless revision.

There are several different brand names and makes. However, all interactive whiteboards carry out the same function including: enabling the teacher or students to control the computer from the board itself rather than using a keyboard and mouse, although these can be used as well (BECTA, 2004). Becta (2004) explained by pointing out that, in a simplest term, a multimedia projector allows the user to display anything that is on their computer for an audience, and to control the computer from the interactive whiteboard itself instead of having to return to the computer. This

allows even a novice user to run applications such as CD-ROMs, word-processing documents, spreadsheets, presentations and the internet simply by 'clicking' in the right places on the board without losing engagement with a class. With a little bit of practice, teachers can then start to use 'floating tools' to add notes or comments and highlight sections of these pages.

According to Becta (2004), there are three key types of IWBs, these are Infra-red/ultrasound kits Infra-red or ultrasound kits fix to any standard whiteboard or any hard surface via clips or suckers. They use special pens (or pen housings to hold standard marker pens); Passive whiteboards - these have a dual membrane resistive board which is touch sensitive; and active whiteboards - These solid-state impact-resistant whiteboards are operated with an electronic or cordless stylus to detect the content being drawn to the whiteboard. Moreover, common features of IWBs have been identified to include pages, pens and highlighters, template and backgrounds, and shapes. The educational use of IWBs is innumerable. Notable among the uses are presentation of students' work in a more interactive and collaborative model. Show video clips that explain difficult concepts (in any curricular area). Demonstrate how an educational software program works, e.g., an art program with students using their fingers and hands to draw rather than working with a mouse. Cater more effectively for visually impaired students and other students with special needs. Display Internet resources in a teacher-directed manner. Create handwritten drawings, notes and concept maps during class time, all of which can be saved for future reference.

Background to the University of Ilorin, Nigeria

The University of Ilorin is located in the ancient city of Ilorin, the capital of Kwara State. The state shares boundary with Kogi, Oyo, Ekiti and Niger states. The University of Ilorin is one of the seven third generation Universities established by the Federal government of Nigeria in August 1975. Following an entrance examination, 200 foundation students were admitted into residence on Saturday, October 23rd, 1976 and academic activities commenced on Monday 25th, 1976.

In October 1977, the Institution attained full autonomous status and has since then developed by leaps and bounds. The student population of 200 in 1976 has increased to 20,084 by the 2014/2015 session, while the total staff strength of the University stood at approximately 3,476 as at 2013/2014 academic session. The senate of the university decided to adopt the use of Interactive Whiteboard (IWB) for teaching and learning in various Faculties. They started the installation of the Interactive whiteboard (IWB) on the 28th October, 2014. The various Faculties, Colleges and Offices that makes use of this IWB includes, Art, Communication and Information Sciences, Engineering, Education, Law, Life Science, Agric Science, Management Science, Social Science, Physical Science, Veterinary Medicine, Pharmaceutical Science, College of Health Science, Library, Directorate of COMSIT, Senate. The University is striving to improve her e-learning capacity building, part of this effort is the installation of interactive whiteboard into various classrooms which serve as a platform for students to be motivated and enhance the quality of teaching and

learning. This new development has boosted the image of the school within and outside the country.

Use of Interactive Whiteboard at the University of Ilorin

The use of IWBs at the University of Nigeria is considered an innovative better by far idea. This university has been known for the past years to be a pace setter university. Currently, the university is No.4 in Nigeria going by the latest 2015 Webometrics Ranking of Nigeria's Best 100 Universities released 12:15pm On 13th January and the one release by 4icu.org which is located at: <http://www.4icu.org/ng/>. Before this time, the previous ranking of universities in Nigeria by these two organizations have seen University of Ilorin, occupying No. 1 position for three different times in 2012, 2013, (July 29, 2014; <http://www.myschoolgist.com.ng/ng/4icu-latest-ranking-unilorin-nigerias-1-varsity/>) and Dec. 2014. University of Ilorin is known to be a university with the most stable academic calendar in Nigeria and pioneer in some academic activities and initiatives notably the use of Computer Based Text (CBT) and some other stuff.

As part of her efforts to continuing playing this leadership/pacesetter's role and improve her academic activities to realize her vision which is 'to be an international centre of excellence in learning, research, probity and service to humanity' and to achieve her mission statement which is 'to provide world-class environment for learning, research and community service'.

The university, in realization of these, wants to make sure that all hands are on deck to make sure that learning become interactive and effective in the university. Another innovative better by far idea introduced by the university is the launches of mobile application on android platforms to making learning and teaching effective

and enhance research. This is in its bid to retain its position as among the best Nigerian universities.

The university pioneered the integration of Mobile application in learning. The Unilorin mobile apps have 30 applications that bring the best experience in learning to students and the University community. The applications include Unilorin e-learning portal, Unilorin Map, Unilorin Cloud, Academic Publications, and Unilorin Journals. It also features apps such as Academic Programme, Students' Portal, Unilorin Videos, VC's Speech, Unilorin Facebook and Twitter among others. The apps would ensure the full utilisation of the PC Tablets made available to new students. Through the deployment of the mobile applications on the android platform, the mobile learning can be accessed anywhere and at the exact moment learning is required. The mobile learning at the university will enable training to be 'situated rather than stimulated' making learning possible at the point of need. The university assumed that the "always-available" nature of mobile learning empowers learners to take the initiative and direct their own learning activities. Reading (text and graphics), video, animation, working through decision trees, listening to podcasts, contributing to discussions (forum or sms), researching on the internet, choosing correct answer (text or photograph), rating skills on diagnostics etc., are all opportunities for offering learning on mobile devices in the university. Students can download the Unilorin mobile apps from the university website or by simply searching through the google play or android market. The apps can easily be assessed by scanning the QR code. All of these efforts are for the University of Ilorin to continue to improve its ICT facilities to "make learning and teaching effective and fun".

Partnership with one of the giants' telecommunication companies in Nigeria Glo, to stream students' lectures online is the latest innovative better by far idea by the University of Ilorin. The technical partnership with the biggest home-grown telecommunications network, Globacom, will be to place the university's curriculum and academic work on the network's telecommunications infrastructure. This gesture will take education in Nigeria to a higher level as students will be able to access their lectures and lecturers from anywhere in the world. The platform will be accessed through students' hand-held devices or computers. The plan to revolutionise the classroom experience of Nigerian university students ride on Globacom's vast and modern voice and data technology.

Globacom has an electronic learning (eLearning) template that can put all faculty curriculum, lecture notes and cached teaching sessions for up to five years on the intranet or internet for the academic community to access at will and from anywhere. This is in addition to video streaming, local intranet and extranet, web-based learning plus teleconferencing facilities which can make a live connection between students in a class and a lecturer from anywhere in the world. Through this partnership, Globacom offered to also provide the University of Ilorin community with internal communication solutions including Closed User Group (CUG), fixed wireless connections and Bucket GPRS services which provides bulk data bundle for the entire community and PABX connections.

From these analyses, the University of Ilorin has introduced a combination of tablet and interactive whiteboard to facilitate teaching and learning. This is because interactive and tablets are portable and much more flexible in their use. With easy-to-use whiteboard software, the creative and

engaging lessons created by lecturers using them are nothing short of amazing and are being used to teach topics in a fun, interactive way. A step into a lecture room where students are learning with an interactive whiteboard at the university will enable the feel of the increase of energy and motivation in the classroom.

Related Studies on the Use of Interactive Whiteboard

Al-Faki and Khamis (2014) investigates the difficulties that teachers in Jeddah schools experience when they use the interactive whiteboard in English language classes. This study focused on the difficulties teachers face in the classrooms in the Saudi contexts. The findings revealed that there are many challenges that teachers face when using the interactive whiteboard. They are categorized into four groups as: teachers', school administrations', technical support's and students' factors. Each factor entails a number of challenges. The study concluded that, these challenges interact together to hinder IWB integration in teaching and learning.

In Taiwan (Jang & Tsai, 2012) examined the reasons for using or not using interactive whiteboards (IWBs) by elementary school mathematics and science teachers. It also considered whether there were any significant differences in the reasons according to teaching subjects, teacher gender, and teaching experience. The survey was developed based on an overview of the discussions from prior research related to the benefits and drawbacks in using IWBs. Percentages were high on all six reasons for using IWBs. Of the five reasons for not using IWBs, budget constraints appeared to be the most important reason why the teachers did not use IWBs in their classroom. Male teachers using IWBs showed significantly higher ratings than female teachers for getting

students' attention and increasing interaction. Experienced teachers' ratings were significantly higher than novice teachers for getting students' attention, helping teachers explain complex and abstract concepts, and helping the teaching process. Among the group of teachers who reported not using IWBs, male teachers showed significantly higher ratings for the lack of time to design teaching materials, and limited sources of related teaching software. Research implications of this study were provided along with suggestions for future study.

However, other researchers found some challenges in using IWBs, including the cost of installing an IWB, the time it takes teachers to prepare classroom lessons, and inappropriate use of the IWB causing students' confusion on learning contents (Miller & Glover, 2002; Schmid, 2008). Miller and Glover (2002) examined benefits and problems of using IWBs with 35 elementary teachers. The data were obtained from a questionnaire including closed and open-ended questions, and participating teachers' comments, classroom observations and interviews. Limiting the benefits of using IWBs, teachers reported that they did not have sufficient time to design classroom lessons and materials to help them successfully use IWBs in teaching. In addition, teachers reported the difficulty of not having a technical consultant available to help with their immediate needs in solving technical problems when using IWBs in their classroom. In prior studies on the use of IWBs, benefits and drawbacks have mostly been discussed on the basis of qualitative data analyses. The author reviewed the research related to the benefits and drawbacks of the use of IWBs from prior empirical studies, and incorporated the reasons for using or not using IWBs into a survey. This was used to examine Taiwanese elementary school mathematics

and science teachers' ratings for their reasons.

Schmid and Whyte (2012) in Germany secondary schools tested the prediction that the hegemony of this paradigm may not extend beyond well-researched university and private ESL contexts by examining the integration of interactive whiteboard (IWB) technology by non-native speaking teachers of EFL in state schools in France and Germany. Teachers' cognitions were investigated via longitudinal qualitative empirical data, involving classroom observations, video recordings of lessons, in-depth interviews and video-stimulated reflections. Findings suggest that in spite of communicatively oriented, socio-constructivist training, teachers used IWB technology to implement a variety of different approaches. The paper traces teachers' use of different models, from traditional grammar-translation to more communicative and constructivist models of task and project-based learning. It shows how individual teachers' approaches are shaped by a variety of factors, such as teachers' teaching and learning experience, pedagogical beliefs and institutional demands. These findings illustrate the complexities of technology integration in CALL and show how teachers often adapt or ignore hegemonic pedagogies to construct their own representations of the technology which are more in line with their curricular and personal goals.

Murcia and Sheffield (2010) studied four elementary science teachers' classroom discourse through their integrative use of IWBs in an inquiry-based learning environment. Participating teachers received expert input from the researchers and technology consultants, as well as three sessions of professional trainings at the initial stage of the project. These sessions covered implementing instructional skills in the inquiry-based science learning

environment, development of IWB skills, and discourse to support learning through scientific inquiry. Researchers also developed an online resource site to continue supporting teachers' professional learning and to provide sources for technology use. A mid-point meeting was held for teachers to reflect on their actual practices and adjust their teaching approaches if necessary. A final meeting was held with participating teachers, technology consultants, and representatives of the schools to provide opportunities for participating teachers to share their interactive teaching approaches with IWBs and the learning process of practicing the approaches in their classroom. Video data was collected before and during the use of IWBs in scientific inquiry lessons. Video-recorded lessons prior to the project served as a baseline for data analyses. Comparisons of the data on the pre-IWB and post-IWB use indicated that the use of IWBs increased interactive discourse in students' communication. When teachers used IWBs, they were more likely to require students to participate in discussions, use more open-ended questions, and extend waiting time for their students to think and process the information. In this particular learning environment, students produced higher quality discourse as they increased their discussion related to argumentation-reasoning and exploration in science learning.

Other researchers further examined how the integration of IWB in teaching can enhance students' comprehension of mathematical thinking (Taylor, Harlow, & Forret, 2010), motivation (Beauchamp & Parkinson, 2005; Schmid, 2008) and performances (Lopez, 2010). Therefore, the use of IWBs has been evidenced to positively influence teachers' integrative skills, with developing their pedagogical

approaches and students' learning as associated outcomes.

Beauchamp and Kennewell (2010) distinguish between interactive technology and interactive pedagogy; while the former might require pupils simply to "press buttons and drag objects across the screen" from none (the IWB is no more than a "suitable surface for a projected image" p. 763) to synergistic interactivity (the IWB is used to store, retrieve and amend ideas), involving a change in ownership (of the board, and thus of learning). The authors particularly value synergistic interactivity, which they concede requires high ICT skills, but they consider it more effective in producing learning. These researchers value the potential of the IWB in fostering communal work and learning from mistakes, two key aspects of current second language teaching.

The literature extends these findings by showing how teachers generally start by developing technical mastery of IWB functionalities, often experiencing Fullan's (2001) implementation of pedagogical effectiveness as they adjust to the new technology. In research into IWB use among mathematics and modern languages teachers, Glover, Miller, Averis, and Door (2007) find that only once technical competence is achieved do teachers look for pedagogical advantages. Schmid (2010, p. 169) documents a similar evolution in a German EFL teacher who first asked "what she could do with the technology," but then "how the technology could support her teaching."

Hennessey, Ruthven, and Brindley (2005) found that teachers generally adopted the IWB tools and affordances which fit with the subject culture, rather than adapting to fit new tools. Similarly, Gray (2010) contests the claim that UK modern

(Beauchamp & Kennewell, 2008, p. 313), the latter is more challenging for both teacher and pupils. Beauchamp and Kennewell (2010) stress the role of the teacher in using the IWB to promote interactivity in its pedagogical sense, establishing a scale of interactivity ranging from transformation via technology. While acknowledging the value of the IWB for second language needs and practices such as multimodal input, noticing, and CMC, Gray contends that UK foreign language teachers are already expert in whole-class interactive teaching and rejects the assumption that "technology can transform any teaching, anytime, anywhere, and that transformation is always good." For Gray, when these teachers use the IWB to increase rather than devolve control of the learning process, their response is both appropriate and effective in that particular context:

From the synopses of related studies, it could be deduced that IWB is very promising in its use for teaching and learning as it improves learning outcomes, promote interactivity in class, saves time and cost among others. However, literature revealed a number of challenges associated with the use of IWBs. These vary from technical problems, to administrative, to teachers/lecturers and the students at large. Meanwhile, it is expected that, University of Ilorin, who is just putting in place, the IWBs platform; will maximize its potentials and at the same time develop modalities to cope with its associated challenges.

Methodology

Research Design: A Survey design was used in this study. This design helps researchers to obtain general results about the sample (Karasar, 2005). One of the main reasons employing survey design was that it could enable the researcher go to the field and collect data on the topic in

question from a small sample of the population in a short period. The objective is to gather small sample of the unit of the study.

Area of Study: This study was carried out at the University of Ilorin, Ilorin, Kwara State. It cut across campus faculties at the main campus of the University that makes use of the interactive whiteboard in their classrooms.

Population: The population of this study consisted of undergraduate students at the University of Ilorin. According to the 2014/2015 annual report of the university, the total number of undergraduates students stands at 29,912 in all the (15) faculties that made up the university system. The population spread across 10 faculties out of the 15 faculties that made up the University of Ilorin. The faculties are; Art, Life Sciences, Communication and Information sciences, Engineering, Law, Social sciences, Physical sciences, Education, Agric, Management sciences.

Sample and Sampling Technique: The simple random sampling technique where all the students in each of these faculties were given equal chance of being selected was adopted to select sample for the study. There are 15 faculties that made up University of Ilorin. A total of Ten faculties where IWBs has been installed and used for teaching and learning in the university were covered out of the 15 faculties. From each faculty a total of 50 respondents (undergraduate students) were selected, this gave a total of 500 respondents which represent the sample for the study.

Instrument for Data Collection: A self-designed questionnaire was used to gather on the study. The questionnaire was a closed ended/structure questionnaire. The

questionnaire was divided into two (2) sections. Section A required the respondents' bio-data information while section B contained the items. The section B is sub-divided into six parts, A, B, C, D, E, F based on the objectives and research question of the study. It was structured as follows: Part A: Perception of interactive whiteboard. There are 5 items in which respondents were required to respond by ticking from the options provided. Part B: Awareness of interactive whiteboard, 5 items in which respondents were required to tick one from the options provided. Part C: White Board Availability, 2 items. Part D: Satisfaction with Interactive Whiteboard, 8 items, Part E: 6 items and Part F: 6 items. Three and Four points likert type response formats was adopted.

Validation and Reliability of the Questionnaire: To ensure the reliability of the questionnaire before final administration, it was given to two research experts. The instruments were modified based on the suggestions and comments by the experts. The comments by the experts justified the questionnaire as valid instrument for use in this study for having both the face and content validity. To achieve reliability of the instrument used in this study, a test-retest reliability method of two weeks interval was adopted. Data collected from the test-retest method was subjected to Crobach Alpha and the reliability co-efficient yielded an $r = 0.89$. This was considered high enough for data collection.

Procedure for Data Collection: The copies of the questionnaire were administered in each of the faculty immediately a lecture is over on interactive whiteboard platform. A total of 400 copies of questionnaire were administered to the students out of which a total of 391 copies

were returned completely filled. This was
Method of Data Analysis: Collected data from the administration of questionnaire was analyzed using simple percentage, and frequency count. These methods were adopted because of their simplicity and easy understanding. The four points response formats adopted in the response to the items in the questionnaire were collapse during data analyses as

used for the data analysis on this study. follows: Strongly Agree and Agree as Agree while Strongly Disagree and Disagree were collapsed as Disagree while others such satisfaction levels and level of awareness remain as they were.

Results

The results obtained from the analyses of the collected data are presented as follows.

Table 1: Distribution of Respondents

	Frequency	Percentage%
Age		39.9%
15-20years	156	52.9%
21-25years	207	7.2%
26-30years	28	100%
TOTAL	391	
GENDER		51.4%
MALE	201	48.6%
FEMALE	190	100%
TOTAL	391	
YEAR OF STUDY		22.8%
100LEVEL	89	26.3%
200LEVEL	103	32.0%
300LEVEL	125	18.9%
400LEVEL	74	100%
TOTAL	391	
MODE OF STUDY		99.5%
REGULAR	389	.5%
SANDWICH	2	100%
TOTAL	391	
FACULTY		10.2%
AGRIC	40	9.7%
ART	38	9.7%
COMMUNICATION AND INFORMATION SCIENCES	38	
EDUCATION	40	10.2%
ENGINEERING	39	10.0%
LAW	36	9.2%
LIFE SCIENCES	40	10.2%
MANAGEMENT SCIENCES	40	10.2%
PHYSICAL SCIENCES	40	10.2%
SOCIAL SCIENCES	40	10.2%
TOTAL	391	100%

The demographic information on the age of the respondents who took part in the study in table 1 reveals that 156 (39.9%) were

between the age of 15-20years, 207 (52.9%) were 21-25years, while 28 (7.2%) fall between the age of 26-30years respectively.

This indicate that the larger percentage were within the range of 21-25years. In addition, 201 (51.4%) of the respondent were male while 190 (48.6%) of the respondent were female. This indicates that more male took part in the study. The results also reveal respondents in their various levels, 100level with 89 (22.8%), 200level with 103 (26.3%), 300level with 125 (32.0%), 400level with 74 (18.9%), the results shows that respondents in their 300level were the majority followed by respondents in their 200level. This study include there mode of entries which were regular and sandwich, 389 respondents were regular with (99.5%) and 2 respondents were sandwich with (.5%). This indicate that majority of the respondents were regular.

On the distribution of respondents based on faculties, the results show that 40

respondents (10.2%) were from Faculty of Agric, 38 (9.7%) were from Faculty of Art, 38 (9.7%) were from Faculty of Communication and Information sciences, 40 (10.2%) were from faculty of Education, 39 (10.0%) were from Faculty of Engineering, 36 (9.2%) were from Faculty of Law, 40 (10.2%) were from Faculty of Life sciences, 40 (10.2%) were from Faculty of Management Sciences, 40 (10.2%) were from Faculty of Physical Sciences and 40 (10.2%) were from Faculty of Social Sciences. It is infer from the results that the least number of respondents were from the Faculty of Law. This might mean that they are not too familiar with Interactive Whiteboard (IWB) as learning and teaching device.

Table 2: Perception of Interactive White Board

S/N	IWBs Perception Items	Agree	Disagree
1.	It is a very interesting learning tool: platform	370 (94.6%)	21 (5.4%)
2.	It is a large, touch-sensitive panel that connects to a digital projector and a computer, displaying the information on the computer screen	334 (85.4%)	57 (14.6%)
3.	A computer electronic devices that makes use of window for installation	302 (77.2%)	89 (22.8%)
4.	A learning platform use for projecting pictures, images and documents	348 (89.0%)	43 (11.0%)
5.	It is an integration of information and communication technology (ICT)	345 (88.2%)	46 (11.8%)

The result from table 2 indicates that the respondents see IWB as a very interesting learning tools' platform with 370 (94.6%) (85.4%) see IWB as a large, touch sensitive panel that connects to a digital projector and a computer, displaying the information on the computer screen while 57 (14.6%) disagreed to the question. Also 302 (77.2%) perceived IWB as a computer electronic devices that makes use of window for installation while 89 (22.8%) disagree to the

indicating their perception for IWB while 21 (5.4%) does not perceived IWB as a very interesting learning tools' platform. 334 question. 348 (89.0%) see IWB as a learning platform use for projecting pictures, images and document while 43 (11.0%) does not IWB as a learning platform for projecting pictures, images and document. 345 (88.2%) perceived that IWB is an integration of information and communication technology (ICT) while 46 (11.8%) disagreed.

Table 3: Awareness of IWBs

S/N	AWARENESS OF IWB	Highly Aware	Aware	NotAware
1.	What is your level of awareness on availability of IWB in your faculty?	89 (22.8%)	212 (54.2%)	90 (23.0%)
2.	What is your awareness about the usage of IWB at the University of Ilorin?	54 (13.8%)	195 (49.9%)	142 (36.3%)
3.	Are you aware that IWB is part of ICT devices?	112 (28.6%)	180 (46.0%)	99 (25.3%)
4.	Are you aware that IWB is a new type of teaching and learning platform at the university of Ilorin?	75 (19.2%)	168 (43.0%)	148 (37.9%)
5.	Are you aware that IWB support communication when used in the combination with a wireless keyboard?	69 (17.6%)	175 (44.8%)	147 (37.6%)

The results on table 3 on the awareness of Interactive Whiteboard (IWB) show that, 89 respondents (22.8%) were highly aware of IWB while more than half of the respondents, 212(54.2%) were aware of IWB and 90 (23.0%) are not aware of the interactive board at the University of Ilorin. Respondents numbering 54 (13.8%) are highly aware about the usage of IWB at the University of Ilorin, 195 (49.9%) of the respondents indicated awareness about the usage while however; 142 (36.6%) of the respondents have limited awareness about the usage of IWB at the University of Ilorin. A total of 112 (28.6%) of the respondents were highly aware that IWB is part of ICT devices while 180 (46.0%) of the

respondents were aware that IWB is part of ICT devices while 99 (25.3%) of the respondents were not aware that IWB is part of ICT devices. Respondents totaling 75 (19.2%) were highly aware that IWB is a new type of teaching and learning platform at the University of Ilorin, 168 (43.0%) of the respondents were aware while; 148 (37.9%) of the respondents were not aware. A total of 69 (17.6%) respondents were highly aware that IWB support communication when used in the combination with a wireless keyboard, 175 (44.8%) were also aware and 147 (37.6%) were not aware.

Table 4: White Board Availability

IWBs Availability Items	Highly Available	Available	Not Available
What is the availability of white board to you as undergraduate student?	41 (10.5%)	166 (42.5%)	184 (47.1%)
The IWB is available for teaching and learning in the university	35 (9.0%)	181 (46.3%)	175 (44.8%)

Table 4 reveal results about the availability of IWB at the University of Ilorin. 41 (10.5%) of the respondents indicate that IWB is highly available to them as undergraduates, 166 (42.5%) also indicate that IWB it's available while 184 (47.1%) which happens to be less than average of the respondents indicates that the IWB is not available to them as an undergraduate

student. Respondents numbering 35 (9.0%) indicates that IWB is highly available for teaching and learning and 181 (46.3%) which are the majority of the respondents indicates that IWB is available while 175 (44.8%) indicates that IWB is not available for teaching and learning at University of Ilorin.

Table 5: Satisfaction with the IWBs Features

Items	Highly Satisfied	Moderate Satisfied	Less Satisfied
Touch screen control of windows applications	96 (24.6%)	203 (51.9%)	92 (23.5%)
Interactivity	111 (28.4%)	203 (51.9%)	77 (19.7%)
Saving/printing of documents	103 (26.3%)	183 (46.8%)	105 (26.9%)
Manipulations of texts and images	103 (26.3%)	193 (49.0%)	95 (24.3%)
Notes and digital inks	92 (23.5%)	203 (51.9%)	96 (24.6%)
Coloring, Annotating and Highlighting contents	107 (27.4%)	200 (51.2%)	84 (21.5%)
Screenshot capturing	103 (26.3%)	187 (47.8%)	101 (25.8%)

Table 5 shows the level of satisfaction with IWB features. A total of 96 (24.6%) respondents were highly satisfied with the touch screen control of windows application feature of IWB while 203 (51.9%) of the respondents were moderately satisfied and 92 (23.5%) less satisfied. Also, 111 (28.4%) of the respondents were highly satisfied with interactivity as a feature of IWB while 205 (51.9%) respondents were moderately satisfied and 77 (19.7%) were less satisfied. A total of 103 (26.3%) of the respondents were highly satisfied with saving printing features of IWB while 183 (46.8%) respondents were moderately satisfied and 105 (26.9%) were less satisfied. Another

103 representing (26.3%) of the respondents were highly satisfied with manipulations of texts and image features of IWB while 193 (49.0%) were moderately satisfied and 95 (24.3%) were less satisfied. Respondents 92 (23.5%) were highly satisfied with notes and digital inks features while 203 (51.9%) were moderately satisfied and 96 (24.6%) of the respondents were less satisfied. In addition, 107 (27.4%) of the respondents were highly satisfied with coloring, annotating and highlighting contents as a feature of IWB while 200 respondents (51.2%) were moderately satisfied and 84 (21.5%) of the respondents were less satisfied. Moreover, 103 (26.3%) of the respondent were highly

satisfied with screenshot capturing features of IWB while 187 (47.8%) were moderately satisfied add 101 (25.8%) of the respondents were less satisfied. The results on satisfaction generally implies that respondents are satisfied with most of the features of IWB and the one they are mostly

satisfied with is interactivity feature of IWB follow by Coloring, Annotating and Highlighting contents, Saving/printing of documents, manipulation of text and image and screenshot capturing features in that order.

Table 6: Most Interesting IWB Features

S/ N	Items	Agree	Disagree
1.	Writability-aligning drawing annotated and writing on screen	309 (79.0%)	82 (21.0%)
2.	Recording- allowing saving and/or printing as a records for learners	281 (71.9%)	110 (28.1%)
3.	Pointability- allowing learners and teachers to physically point to interesting features on the board	312 (79.8%)	79 (20.2%)
4.	Talkability- allowing learners and teachers to talk more directly to the audience from the front	295 (75.4%)	96 (24.6%)
5.	Familiarity- encouraging technological learners to engage with technology more comfortably through a more familiar interface	302 (77.2%)	89 (22.8%)

Table 6 reveals that the respondents have positive interest towards the use of IWB. A total of 309 (79.0%) indicated that IWB can use of IWB is interesting base on its writability while 82 (21.0%) disagreed. Also 281 (71.9%) of the respondents indicated that IWB is interesting to use because of opportunity of recording while 110 (28.1%) of the respondents disagreed. In addition, 312 (79.8%) of the respondents find IWB

interesting in terms of point-ability while 79 (20.2%) of the respondents disagreed while 295 (75.4%) of the respondents also find IWB interesting in the area of talk-ability while 96 (24.6%) of the respondents disagreed. Moreover, 302 (77.2%) of the respondents indicate that IWB is interesting in terms of familiarity while 89 (22.8%) disagreed. The results here imply that respondents find the use of IBW interesting mostly due its writability, pointability and familiarity.

Table 7: Challenges of IWB

S/ N	Items	Agree	Disagree
1.	Complex to operate	201 (51.4%)	190 (48.6%)
2.	Reduction in control over learning and monitoring progress	202 (51.7%)	189 (48.3%)

1.	Lack of proficiency in the use of ICT	215 (55.0%)	176 (45.0%)
2.	Change in working habit	235 (60.1%)	156 (39.9%)
3.	Different classroom organization	243 (62.1%)	148 (37.9%)
4.	Others please indicate	206 (52.7%)	185 (47.3%)

Table 7 reveals results on the challenges of IWB with 201 (51.4%) of the respondents indicating that IWB is difficult to access and operate while 190 (48.6%) disagreed. A total of 202 (51.7%) of the respondents indicated that with the use of IWB there is reduction in control over learning and monitoring progress while 194 (48.3%) of the respondents disagreed. A total of 215 (55.0%) indicated lack of proficiency in the use of ICT which make the IWB not interesting while 176 (45.0%) of the respondents also disagreed. Also, 235 (60.1%) of the respondents do not find IWB interesting in the area of change in working habit while 156 (39.9%) of the respondents disagreed. Lastly, 243 (62.1%) of the respondents indicated that IWB involve of interactive whiteboard, identify the most interesting tool of IWB to the students and the challenges encounter with the use of the platform for teaching and learning.

The first findings in the study showed that students have positive perception towards IWB. The students' positive perception of IWB reported in this study is in support of the report by Boerland (2002) study which explored subject perceptions of interactive whiteboard use and student engagement using a modified CAQ to assess student attitudes towards interactive whiteboards and reported that the IWB is pleasurable, interesting, efficient, and comprehensible to the students. Researchers (e.g. Cheung & Slavin, 2012; Cheung & Slavin, 2011; ESTE, 2008, etc) over the years have demonstrated that learners become enthusiastic learning through technology. The report by (Whyte & Schmid, 2012; Tourk, 2010) and others that interactive white improve performance and

different classroom organization while 148 (37.9%) of the respondents disagreed. This imply that the most challenging issues with IWB are different classroom organization and change in working habit of the respondents cause by IWB.

Discussion of Findings

The aim of this study was to investigate the usage analysis of interactive whiteboard among the undergraduate students of University of Ilorin. The main objective was to examine the perception of University of Ilorin students about the uses of interactive whiteboard, their awareness about the interactive whiteboard, the availability of interactive whiteboard, the level of students' satisfaction with the use learning outcome might be the reason behind the positive perception respondents in this study have towards IWB.

The second findings in this study showed that majority of the students are aware of the usage of interactive whiteboard. The combination of the respondents who are highly aware and aware of the IWB at the University of Ilorin is a little about average and more than those who indicate non awareness. Currently, it is only one IWB that has been installed per faculty as mentioned earlier. Therefore, it is possible that those who indicated non awareness in table 3 have not been taught on that platform or in the lecture room where the IWB is installed. It is also possible that the lecturers of those who indicated non awareness have not being adopting the tool for teaching them because limited lecturers currently possess the skills to teach using the platform.

The third finding in this study shows that respondents have the perception about the availability of interactive whiteboard at the University of Ilorin. The results reveal the majority of the respondents indicate that interactive whiteboard is available at the University of Ilorin for teaching and learning.

The fourth finding in this study shows the levels of satisfaction with the features of IWB. Majority of the respondents were moderately satisfied with the touch screen control of windows application. Other features respondents moderately satisfied with are interactivity tool, saving printing of documents, manipulations of texts and images, notes and digital inks, coloring, annotating and highlighting contents, and screenshot capturing were moderately produced higher quality discourse as they increased their discussion related to argumentation-reasoning and exploration in science learning. The report by Schmid (2008) and Lopez (2010) that the use of IWBs has been evidenced to positively improve performance, influence teachers' integrative skills, with developing their pedagogical approaches and students' learning as associated outcomes may also be the reason users in this study find the use of IWB interesting.

The challenges associated with IWB revealed in this study include the fact that there are access difficulty, reduction in control over learning and monitoring progress, lack of proficiency in the use of ICT, change in working habit and different classroom organization. This corroborates the finding by Al-Farsi and Khumais (2014) who categorized the challenges teachers encounter in their study on use of interactive white board into four groups which are teachers', school administrators', technical supports and students factors. Each factor according to them entails a number of challenges. Similarly, Janj and Tsai

initiated by the respondents as a features of the interactive whiteboard. Learning through IWB is fun, interesting and highly interactive. No wonder the indication of satisfaction with learning through IWB platform revealed in this study.

The fifth finding in this study reveals that respondents find IWB more interesting as a result of it writability, recordability, talkability, and familiarity. This is consonant with Murcia and Sheffield (2010) who reported in their study that when teachers used IWBs, they were more likely to require students to participate in discussions, use more open-ended questions, and extend waiting time for their students to think and process the information. In this particular learning environment, students

(2012) identified the reasons for non-use of IWBs as constraints which appeared to be the most important reason why the teachers did not use IWBs in their classroom. This implies that irrespective of the location where teacher use IWB, there are many challenges teachers face when using the interactive whiteboard. Other challenges identified associated with the IWB in the literature have been the cost of installing an IWB, the time it takes teachers to prepare classroom lessons, and inappropriate use of the IWB causing students' confusion on learning contents (Miller & Glover, 2002; Schmid, 2008).

Conclusion

This study has examined the usage analysis of the interactive whiteboard among the undergraduate student of University of Ilorin. So far, the result generally has indicated the student awareness of IWB. The results also demonstrated that student have a strong perception of IWB as a form of teaching and learning tools. The results also showed that the IWB is available to the undergraduate students as a platform of

teaching and learning. And also, the results indicate that undergraduate are moderately satisfied with IWB, while factors identified as challenges to IWB includes the difficulty of access, reduction in control over learning and monitoring process, lack of proficiency, change in working habit and the different in the classroom organization. Therefore, it emphasized that IWB is veritable tool that can enhance teaching and learning and take it to the next level if the university can invest more on it.

Recommendations

This study find out that IWB is difficult to access, especially with use of personal computer and different classroom organization which were seen as the major problems according to the respondents. In the light of this, it is suggested that the university should increase the numbers of IWB in each faculty in order to make it accessible by the students. And also orientation should be given to students on the use of IWB for teaching and learning. Reduction in control over learning and monitoring process was also confirmed as one of the challenges faced by the respondents. Therefore, it is recommended that, more practical work, should be carried out on IWB and the IWB should be installed in rooms where it can be easily monitored. Lack of proficiency in the use of ICT (lack of computer skill) was also noted as a challenge to the use of interactive whiteboard. This problem can be solved, if the university includes a computer course where students will be taught preliminary foundation or basic computers together with information and communication technological courses.

Implication of the Study

The importance of this study lies in its practical value and its contribution to the pedagogical body of knowledge. The

outcomes from this study will give an insight into the perception of undergraduate students of the University of Ilorin on the use of interactive whiteboard for teaching and learning. The research/findings from this study could be more beneficial to students as well as the selected institutions. The outcome from this study is expected to create awareness that could increase student's knowledge of inquiry and perception on technology and its uses on their academic performance. IWBs will also provide faster access to information and will motivate them for further research. Furthermore, the outcomes will play a vital role in upgrading teaching and learning, information provision and dissemination at the University of Ilorin. It is also hoped that, this research will encourage the University authority to provide more IWB to aid teaching and learning in the classrooms in order for the students to be motivated and satisfied in their learning. It will help to understand how much people value technology, their attitude when using IWB and most importantly how they utilize it.

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