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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.
P.M.B. 65, MINNA,

**CONFERENCE
PROCEEDING**

THEME:

**SCIENCE AND TECHNOLOGY
EDUCATION IN THE TRANSFORMATION
OF DEVELOPING NATIONS**

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Minna - Nigeria.

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Niger State College of Education, Minna

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PREFACE

It is indeed gratifying to write the preface to this 1st International Conference proceeding of the School of Technology Education of Federal University of Technology, Minna. I have the honour to appreciate Professor V. I. Ezenwa, the pioneer Dean of the School who brought the news at one of the meeting of the Department of Science Education, sometimes in 2009, that the University is interested in establishing a school of this nature. Sequel to this information by the Professor, who was then the nodal officer of SERVICOM Federal University of Technology, Minna; the Department made me the first chairman of the committee to draft a proposal for the establishment of School of Technology Education. This committee made the first draft of the document by liaising with staff of the Industrial and Technology Education Department. The Committee through the then HOD Science Education, Professor I. N. Mogbo and HOD Industrial Technology Education, Professor K. A. Salami arranged for a joint departmental meeting of the two departments which took place on the 18th of January, 2010.

At the joint meeting of the two departments, a new Committee was set up to work on the document my committee drafted. This new committee has the following members:

- | | |
|------------------------|------------------|
| 1. Prof. G. D. Momoh | Chairman |
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Consequent upon the work of this committee, the School of Technology Education (STE) was established on 17th October, 2012 by the University Senate.

At the 2nd STE board meeting held on 31st October, 2012 some committees were formed among which include STE 1st International Conference Committee and I was opportuned to be made the chairman. These are what informed my gratitude to Allah for the opportunities He (Allah) gave me to serve the University and my Community.

Nevertheless, Science and Technology Education are the tools for development in the developed world. They have been responsible for the change taking place in the global arena. Science and Technology Education have been responsible for creating global knowledge based economies which are highly advanced as a result

Determination of Teachers Competencies and Knowledge in Teaching Through Interactive White Board

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Abstract

This research determines teachers' competencies skill and knowledge in teaching and learning through interactive white board in some selected secondary school in Niger state. One hundred teachers were sampled for the study. A thirty-item questionnaire tagged Teachers Competencies Skills and Knowledge in teaching and learning through Interactive white board was used to gather and analyze data for this study, using frequency counts and percentages to analyze the data gathered. The finding of this research shows that most of the teachers do not have competencies skills and knowledge in teaching and learning through interactive white board. Also none of the school had working internet facilities and interactive white board. This amounted to the factor that militated against their inability to teach through interactive white board and awareness was low about using interactive white board. Lack of computer skills and knowledge were also highlighted during the course of the research. Finally, the use of technologies introduced into teachers preparation programme to replace all traditional were chalk board with interactive white board to enhance teacher's competencies in teaching through interactive white board.

Keyword: IWB teacher's competencies skills and knowledge

Introduction

The aims of education changes based on the era, is a technological era of the use of information technology may be viewed in different ways, due to difficulties of keeping up with its changes as they happen so fast. It is techniques that people use to share, distribute, and gather information and to communicate through computer and computer networks (Desai, 2010). Ogunsola and Aboyade in Adomi and Kpangban (2010) viewed ICT as a cluster of associated technologies defined by their functional usage in information access and communication of which one embodiment is the internet. Studies have indicated the advantages of using these information and communication technology facilities for teaching and learning. UNESCO (2004), indicates that it enables teachers and students to demonstrate understanding of the opportunities and implications of the uses of learning and teaching in the curriculum context, plan, implement, and manage learning and teaching in open and flexible manner. In another study Adomi and Kpangban (2010) ICT have the potential to strengthening teaching and helping schools change this is evidenced in the level of ICT application in secondary schools in Nigeria.

These benefits of the use of ICT in education have created demands of new skills for the graduates of educational system. World Bank cited in Adeyomo (2010) asserts that globally, the use of ICT is fast gaining prominence becoming one of the most important elements defining the basic competencies of students. Five central skills on students demand on competencies and skills;

1. Information skills (Literacy): skills that relate to the ability to gather, edit, analyze, process and connect information.

2. Higher order thinking skills in particular problem-solving, critical thinking, creative and entrepreneurial thinking.
3. Communication and cooperation skills: the ability to work in team and to belong to various communities.
4. Skill to use technologies tools despite the feeling that young people know how to do this
5. Learning skills: in particular, the development of autonomous learning, (Melamed & Salant, 2010:6)

Against this background school on one part whom is to prepare this generation of students for the future, therefore has the responsibilities to developing in its students these central skills that will required them in order to succeed and cope with the challenges that awaits them as they grow up. Teachers on the other part are the life-wire of any education system. School place, books, and classroom are useless without teachers Sarita & Tomer (cited in Nadeem, Rana, Lone, Maqbool, Naz, & Ali 2011). This position of teachers in the preparation of students has implication for their professional competencies skills and knowledge in order for them to develop in students the five central skills appropriately.

Professional competencies of teachers are presented as follows:

- Field competencies
- Research competencies
- Curriculum competencies
- Lifelong learning competencies
- Social-cultural competencies
- Emotional competencies
- Communication competencies
- Environmental competencies
- Information and communication technology (ICT) competencies

Components of teachers' professional competencies.

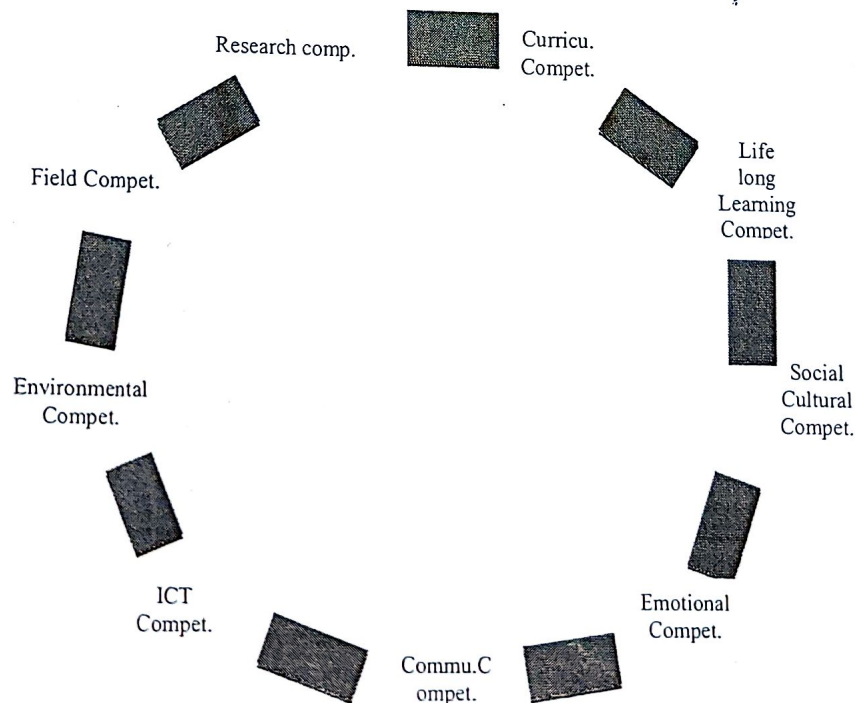


Figure 1: Components of teachers' professional competenciesSource (Selvi, 2010:168-169)

Competencies can be viewed as the ability required performing an activity. To Selvi, information and communication technologies competencies of teachers' are teacher's knowledge and skills of using tools and technical equipment's for the teaching, distributing and transferring of knowledge. They include all technologies for manipulation and communication of information. In a wider dimension the type of ICT competencies required by teachers in education as described in UNESCO Bangkok document as cited in Majumdar, (2005) which states that collection of knowledge, skills and attitudes are inextricably bound up with the contexts and pedagogy.

Technology such as the interactive white board is a form of information and communication technologist's tools used by teachers in teaching and learning this will develop in both teachers and students the five central skills and the type of competencies required of them as described by UNESCO in Majumbar. The interactive whiteboard has replaced the traditional white boards, flipchart, video/media system (Daniel, 2009). It has different products and version with accompanied potentials. It is a large touch sensitive display board with attached pen tray and software called smart notebook, the IWB board can be mounted on the wall or stand. It can be used at all levels of education and in various settings. The use of interactive white board integrates the functions of the traditional whiteboard with additional functions that enable interactive and constructive learning and teaching Betcher & Lee, Way, Lifeley, Ruster, Johnco, Mauric & Ochs as (cited in Manny-Ikaha, Daga, Tikochinski & Zorman, 2011). The IWB receives input electronically by touch. It supports the use of multiple users at the same time; user/users control the computer using a pen, finger, stylus or other devices. The board presents pictures projected from the computer and allows for changes. Glover, Miller, Averis and Doo, (2005) presents the following unique activities in the class that can be carried out with IWB.

1. *Drag and drop: an item on the board*
2. *Hide and reveal: an item located on top of others can be removed*
3. *Highlighting: a clear colour that can be placed on top of writing*
4. *Animation: items can be spun, change size and move in a predetermined direction.*
5. *Storage and recall: unlimited storage and quick recall of material*
6. *Feedback when touching a particular item, there is visual or auditory feedback.*

The use of interactive whiteboard has been in operation in developed countries like United States of America (USA), Mexico, Italy, Britain and Australia (Manny-Ikaha, Dayan, Tikochinski & Zorman, 2011). This study seeks to determine teachers' competencies skills and knowledge in teaching through information and communication technologies tools' using the interactive whiteboard (IWB). This study also seeks the following.

1. Determine secondary school teachers competencies skills and knowledge in teaching through (IWB)
2. Determine if (IWB) facilities are available for teaching through (IWB)
3. Determine factors hindering teacher's competencies skills and knowledge in teaching through IWB

Research Questions

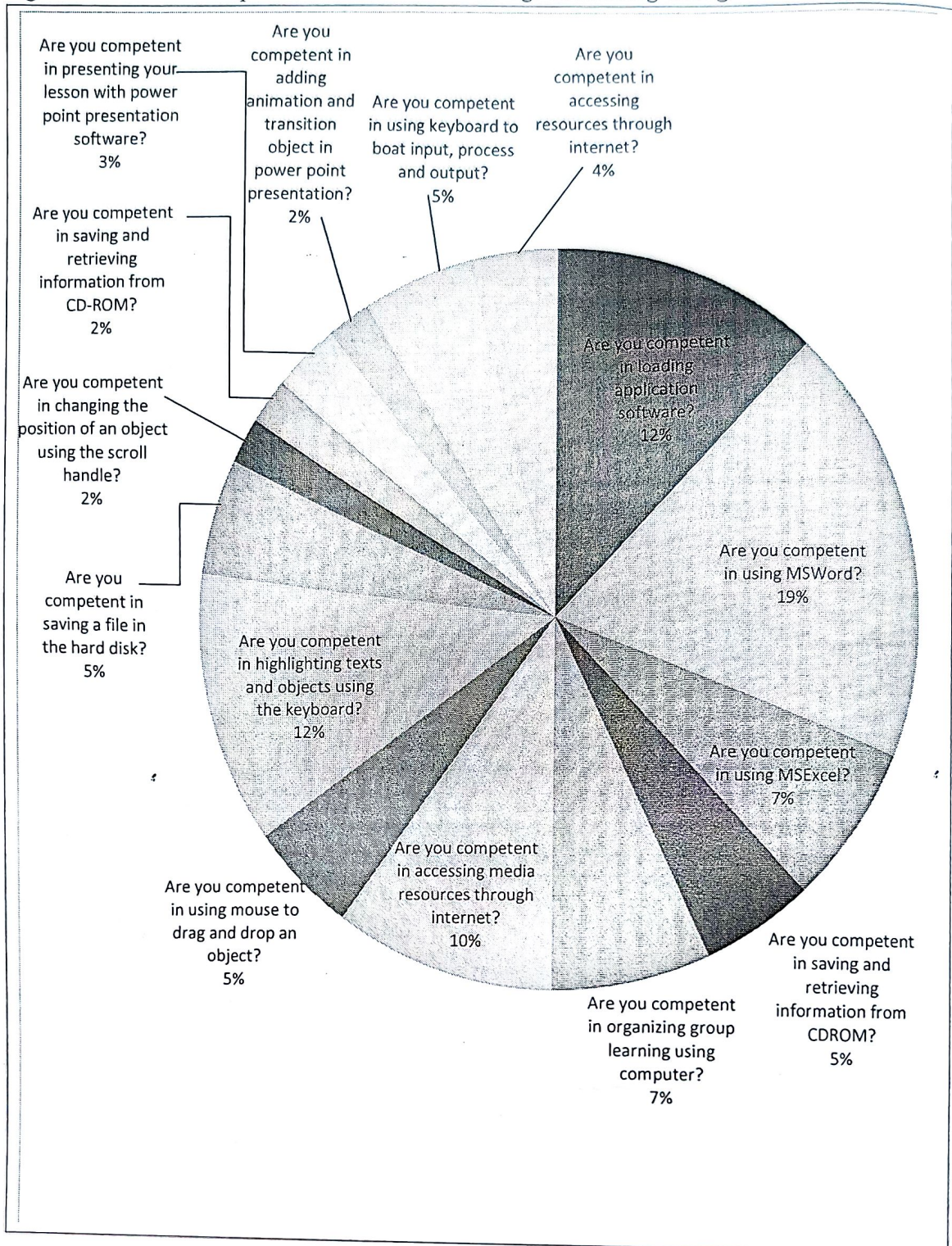
1. What competencies skills and knowledge do secondary school teachers possessed in teaching through IWB?
2. What IWB facilities are available for teaching through IWB?
3. What factors hinders teachers' competencies skills and knowledge in teaching through IWB?

The study is a descriptive survey design the researcher collect information about teachers competencies skills and knowledge in teaching through interactive whiteboard (IWB) without manipulating any variable. Two hundred and fifty teachers (250) from ten

(10) secondary schools purposely selected for this population. Out of the two hundred and fifty teachers (250), one hundred and fifty teachers (150) were sampled for the study. Simple balloting technique without replacement was used in selecting ten (10) teachers from each school. Finally only one hundred and twenty (120) teachers were used for the study. A questionnaire tagged teacher's competencies skills and knowledge in teaching through IWB (TCKIWB) was used for the study. It consists of thirty (30) items with three (3) sections. Section A is made up of fifteen (15) items measuring teachers competencies skills, section B deals with (IWB) facilities available for teaching through (IWB) while section C deals with factors militating against teachers competencies skills and knowledge in teaching through (IWB). The instrument was given face and content validity based on the research questions raised for the study. Three ICT experts from FUT ICT unit were used for the content validity. The initial thirty five (35) items were restructured and modified to 30 items. To ascertain the reliability of the instrument test-retest method was used. The instrument was administered to fifteen (15) respondents whom were not part of the sampled schools. After two weeks the instrument was re-administered to them. A reliability co-efficient through Pearson Moment co-efficient yielding an $r=0.72$ was arrived at. The questionnaires were administered to the sampled teachers for the study with the aid of research assistants and vice-principals of the respective schools. The questionnaires were collected back on the spot; out of the one hundred and seventy (170) questionnaires administered only one hundred and twenty (120) were valid for analysis. Data collected for the study were analyzed using frequency counts and percentages. Tables A and graphical representations were used to present the results.

Research question 1; what competencies skills do secondary school teachers possess in teaching through IWB?

Figure 1: teacher's competencies skills and knowledge in teaching through IWB



The figure 1 shows that 19% of the teachers are competent in the use of MSWord, 10% in highlighting text and using the keyboard. Only 10% can access media resources through the internet competently and 12% can load application software.

Research question 2:

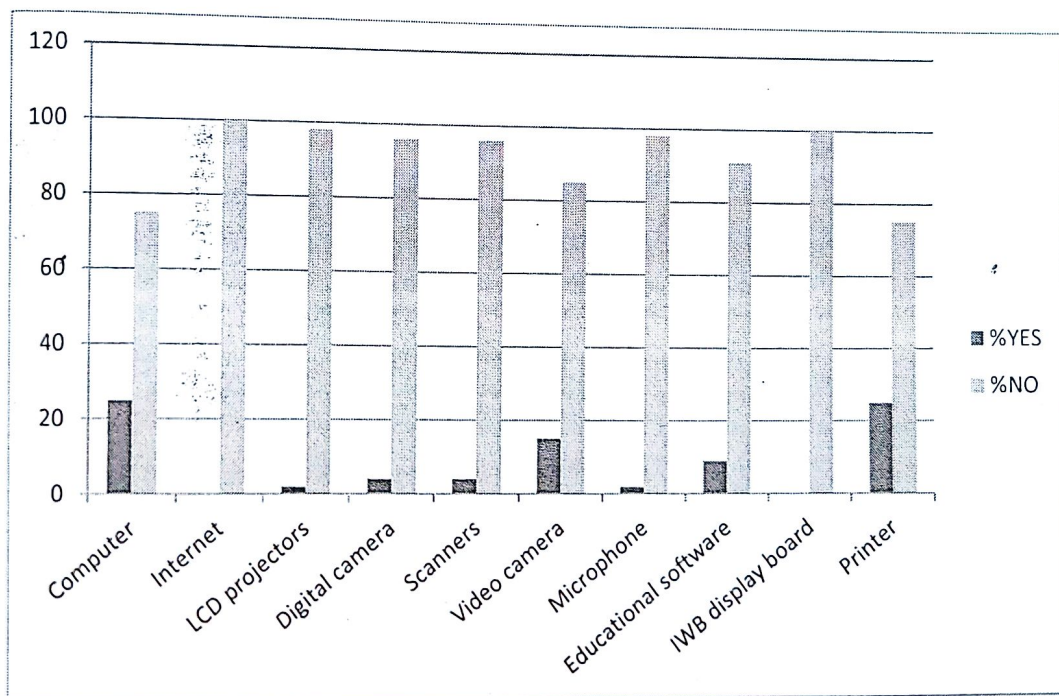
What (IWB) facilities are available in secondary schools for teaching through (IWB)?

Table 1: IWB facilities in secondary schools

S/N	Facilities	%yes	%no
1	Computer	25	75
2	Internet	-	100
3	LCD projectors	1.67	98.33
4	Digital camera	3.33	96.67
5	Scanners	3.33	96.67
6	Video camera	14.17	85.83
7	Microphone	1.67	98.33
8	Educational software	8.33	91.67
9	IWB display board	-	100
10	Printer	25	75

Table 1 show that none of the schools had an Internet facilities and IBW display board while majority of the school have little IWB facilities. This is presented in a graph below:

Figure 2: percentage of IWB facilities available in schools for teaching through IWB



Research question 3:

What facilities militate against teachers' competencies skills and knowledge in teaching through (IWB)?

Figure 2: percentage of IWB facilities available in schools for teaching through IWB

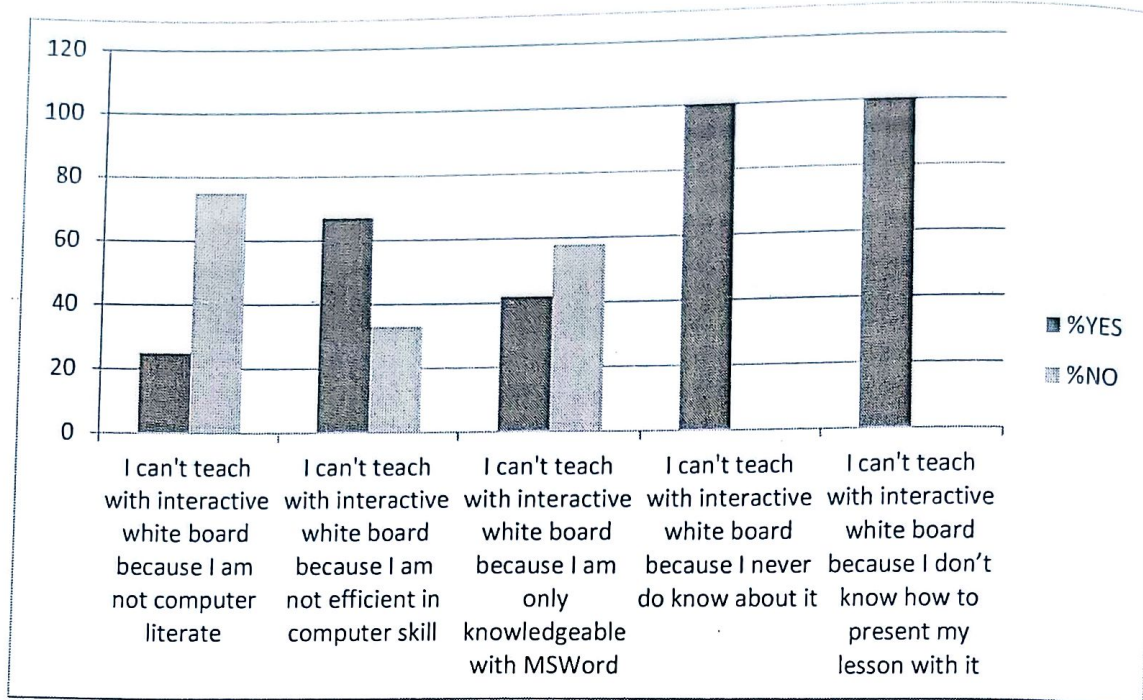


Figure 3 show that the major factors militating against teachers inability to use IWB for teaching is because they neither know about it or how to use it. While 25% cannot teach with IWB because they are not computer literate, 67% cannot because they are not efficient in computer skills.

Discussion; The study determined secondary school teacher's competencies skills and knowledge in teaching through information and communication technologies tools: the interactive white board (IWB). The findings indicate teachers' competencies skills and knowledge on (IWB) was generally low. The findings agreed with Okoyefi and Nzewi (2012) Assessment of ICT competencies possessed by biology teachers in Nsukka education zone are not competent in the use of ICT in all the required areas as stipulated by UNESCO. The development of teachers' competencies skill in teaching through ICT (IWB) is not an individual teachers' task. It is the task of teachers training institutions to develop it teachers the relevant ICT skills by integrating ICT in their training programmes. On IWB facilities available for teaching through IWB it shows that none of the schools had internet facilities and IWB display board. But majority of the schools had some (IWB) facilities. Findings of Fakeye (2010) and Oyejola (2007) indicated that most schools in Nigeria are ill equipped for the application of ICT. In another study by Adeyomo, (2012) on the impact of information and communication technology (ICT) on teaching and learning of physics the findings indicated that only 20:0% of schools have one or two computers, none of the schools have laptop, LCD projector, Video recorder, talking books and roor robots. This may be due to lack of professional ICT technical experts employed in secondary schools.

One of the issues militate against teachers' ability to teach through IWB; the resaerch shows that the major factors are teachers neither know about IWB and how to use it, 25% lacks computer literacy, while 67% are not efficient in computer skills. The findings agreed with Van-Braak, Tondeur and Valcke, (2004) More so Yusuf, (2005) indicates teachers in Nigerian secondary schools are not competent in basic computer operation and in the use of generic software. This result might be due to lack of awareness of the use of IWB in the develop countries like Nigeria.

Conclusion The findings of this research indicate that teachers in secondary schools lack the competencies skills and knowledge in teaching through IWB. It concludes that there is need for developing countries like Nigeria to pay attention to the development of information communication competencies skills and knowledge in pre-service teachers, by integrating the use of technologies in teachers preparation programmes; replace all traditional white boards in schools with the interactive white board to enhance teachers competencies skills in teaching through IWB and provide IWB facilities in schools.

Recommendation ;

1. IWB facilities should be provided in schools.
2. Traditional whiteboard in schools should be replaces with IWB to enhance teachers' awareness and ability to use IWB in teaching and learning.
3. Teachers' training institutions should update their ICT competencies skills and knowledge, and use digital technologies in the training of teachers, so that teachers will have the confidence in teaching through IWB.

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