

THE COMPETENCY LEVELS OF POST-GRADUATE STUDENT-TEACHERS IN USING INTERACTIVE WHITEBOARDS IN 21ST CENTURY CLASSROOM

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ABSTRACT

This study used a descriptive survey design to determine the competency levels of post-graduate student-teachers in using Interactive Whiteboards (IWB) having offered course EDU 514.2 (Media Production) in the Department of Curriculum Studies, Faculty of Education, University of Port Harcourt. The sample size of 111 post-graduate student-teachers was purposefully used for the study. A 21 items questionnaire titled 'Questionnaire on Post-graduate Student-teachers Competency Levels in IWB Utilization (QPCLIWBU)' with reliability index of 0.76 was used to get response for the two research questions that guided the study. Mean (with acceptable criteria of 2.50) and standard deviation were used to analyze the data, while the Null hypothesis was tested with z-test. One of the findings unveiled that post-graduate student-teachers have varying levels of competencies in using IWB. It was recommended among others that teacher training institutions should provide adequate training programs in the use of IWB and other technologies in their curricula.

Keywords: Information and Communication Technology (ICT), Interactive whiteboard and levels of competency.

INTRODUCTION

Information and Communication Technology (ICT) has become indispensable in 21st century classroom. Students in this digital age play around with digital tools such as computers, smart phones, cameras, internet, web 2.0 applications, instant messaging, etc, making these tools part and parcel of their daily lives' activities, especially, their communication and social activities. These students are known as digital natives, (Prensky, 2001), since they came into the world during the digital age. Now, for educators (who are regarded as digital immigrants) to be able to teach these digital natives effectively, they have to speak the language (digital language) these students understand and use the tools (digital tools) these students use, so as to capture their interest, motivate and make them actively engaged in the learning processes. From the current AECT definition of education technology point of view, teachers will facilitate learning and improve performance of students only when they are able to create, use and manage technological processes and resources. It therefore implies that the secret to students' learning and improved performances in this digital age lies heavily in teachers' ability to implement ICT utilization in teaching/learning processes. Garba and Alademerin (2014) noted that education industry is transformed when ICT is integrated in the curricular content of all subjects/disciplines at all levels of learning, and ICT equipment is utilized in pedagogical practices and other educational practices as applicable to schools, colleges and universities.

Interactive whiteboard (IWB) is one of the technological resources used in the 21st century classroom to replace the traditional black/white board and mere projection of computer screen. Interactive whiteboard as the name implies, is an electronic whiteboard that has interactive capabilities and features that enables it to communicate with many other technologies when in connection with computer and projector. Becta's ICT Research Network (2003) noted that an interactive whiteboard is a touch-sensitive board that is connected to a computer and digital projector. Interactive whiteboard therefore represent a touch-sensitive board through which a computer screen is displayed to a board that enables users to navigate through the computer on the whiteboard and vice versa when connected to the computer and projector, thus allowing users to communication to the audience from the board instead of attaching oneself to the computer.

Interactive whiteboard that was originally designed for office use (Pratheesh, 2015) has recently finds its way into the classrooms as an instructional or presentation tool. It is embedded with unique features such as pen, draw, record, annotate, import, drag and drop, browser, etc, which enable users to carry out several activities such as the ability to use finger or stylus as mouse to write, draw, and use other tools on the board; record learning sessions, browse the internet for online resources which can be downloaded in multimedia formats (audio, graphics, texts, images, and video), communicate and collaborate with other users at distance using web 2.0 tools; save lesson contents and other files for future use into the computer while on the board; import materials from other computer application into an ongoing lesson, drag and drop objects or icons; and these, gave the board a huge advantage over other presentation tools like projector and traditional black/white board.

Using Interactive whiteboard as an instructional tool encourages learners' engagement, motivation, creativity, critical thinking and collaboration in the learning process as they have the ability to interact with the board, utilize and share varieties of learning resources (both web-based and computer-based) on the board, to facilitate the understanding of learning concepts. There are therefore several advantages of using IWB in the 21st century classroom which cannot be overemphasized. For instance, Bakadam and Mohammed (2012) noted that IWB allows teachers to animate and play video clips to promote learners' concepts understanding, save lessons for future utilization, monitor exercises of penmanship, edit text, show students' projects during presentation in class, and add internet-based resources.

To effectively use IWB in classroom practices, teachers ought to be acquainted with the technology behind IWB connectivity and also with diverse ways to adapt this technology in pedagogical practices, having the ability to select and adapt the right IWB features for specific contents delivery. These, invariably depends largely on the technological, pedagogical, content knowledge and skills of teachers, and their perceived opportunities and affordances of IWB usage. Bolick, Berson, Coutts & Heinecke (2003) cited in Garba and Alademerin (2014) posit that the success of desirable transformation with ICT is greatly influenced by teachers' ability, efficiency and competence in using ICT equipment for personal and educational purposes.

Studies related to IWB usage have been conducted by previous researchers over the years. European School Net (2013) conducted a survey on Europe's schools' ICT in Education to benchmark their technology access, attitudes and utilization and found among others that many European schools are connected to ICT at basic level. Bennett and Lockyer (2008) examined teachers' IWB integration into classrooms in Australian primary school and found among others that teachers used a variety of pedagogical approaches which were in line with

those they often used in their teaching when using the IWBs. Serkan (2012) analyzed teachers' levels of competency in the use of IWB and found out that they were not satisfactory.

The above cited studies were carried out mainly in developed countries. Based on the researchers' knowledge, little or no studies have been done to examine the competency levels of using interactive whiteboards in the 21st century classroom especially in Port-Harcourt metropolis. It is therefore against this background that the researcher conceived the idea to carry out a study to examine the competency levels of post graduate students-teachers in using interactive whiteboard in the 21st century classroom.

Statement of problem

The enormous growth of technology tools in this 21st century demand that teachers, who are curriculum implementers, be prepared and equipped with the basic ICT literacy, skill and competency in order to be able to utilize these tools for pedagogical purposes. This is imperative, because, as stated in the National Policy of Education, a teacher cannot teach with the tools he/she cannot use. The Interactive Whiteboards have started in recent years to gain rapid acceptance into the 21st century classroom as an important instructional tool, it then becomes necessary for post graduate students-teachers who have at one time or the other being in the classroom and have understood the technological needs of 21st century learners, to be acquainted with the knowledge and skills needed to utilize IWB technology and other digital devices in planning and delivering learning experience in order to ensure better educational outcomes of learners in the 21st century classroom. Most schools, especially, in the developed countries have adopted this technological tool to revolutionize their classroom practices. There is therefore need to understand how competent the post graduate students-teachers, in the developing countries (such as Nigeria) are in using IWB for the 21st century classroom practices.

Therefore, the problem of this study is to determine the extent to which post-graduate student-teachers can connect to IWB and their levels of competency in using it.

Aim and objectives of the study

The main aim of this study is to ascertain the extent to which post-graduate student-teachers use interactive whiteboard in the 21st century classroom.

Specifically, the study intends to:

1. Determine the extent to which post-graduate student-teachers can connect to IWB.
2. Ascertain the post-graduate student-teachers' levels of competency in using IWB.

Research questions

1. To what extent can post-graduate student-teachers connect to IWB?
2. What are the post-graduate student-teachers' levels of competency in using IWB?

Null Hypothesis

There is no significant difference in the mean score of Master's student-teachers and PhD student-teachers in the extent to which they can connect to IWB and their levels of competency in using IWB at significance level of 0.5

METHODOLOGY

The descriptive survey design was adopted in this study in order to determine the reactions of Post Graduate student-teachers (in 2014/2015 academic session) in the department of Curriculum Studies and Educational Technology, Faculty of Education, University of Port-Harcourt over their competency levels in using IWB. Purposive sampling technique was used to select all the Post Graduate student-teachers, who as of the time of this study were 111 (that is, 83 Master's student-teachers and 28 PhD student-teachers. Source: Curriculum Studies and Educational Technology Departmental record). This sampling technique was the best choice for this study because the students have undergone training during their media production class in the course of their programs on how to use digital teaching/learning tools (especially IWBs). Data collection was done using a questionnaire with 21 items titled Questionnaire on Post-graduate Student-teachers Competency Levels in IWB Utilization (QPSCLIWBU) which was constructed by the researchers. Very High Extent (VHE), High Extent (HE), Low Extent (LE), and Very Low Extent (VLE) were the response level use to determine the responses to the items on the instrument and this response level was respectively weighted 4, 3, 2 and 1, with the average of 2.50 (that is, $4 + 3 + 2 + 1 = 10/4 = 2.50$). The instrument was face and content validated by experts in Curriculum Studies and Educational Technology, and Measurement and Evaluation departments. The reliability test was done using Test-re-test method and the reliability coefficient of 0.76 was got using Pearson's Product Moment Correlation Coefficient. The research questions were answered using Mean and standard deviation and the null hypothesis was tested with Z-test at $P < 0.05$. A mean of 2.50 or above indicates agreement with the item statement while a mean of 2.49 or below indicates disagreement.

RESULTS

The results presented here were according to the research questions and hypothesis.

Research question 1: To what extent can post-graduate student-teachers connect to IWB?

Table 1: Mean Analysis of the extent to which post-graduate student-teachers can connect to IWB

Items	VHE	HE	LE	VLE	Mean	SD	Decision
1. I can install IWB driver software to my computer	16	44	29	22	2.49	0.96	Low
2. I can connect IWB to my computer using USB cable	26	41	25	19	2.67	1.02	High
3. I can connect IWB to my computer wirelessly via Bluetooth	8	37	46	20	2.29	0.84	Low
4. I can connect a digital projector to my computer in order to display computer images onto the IWB surface	31	39	29	12	2.80	0.97	High
5. I can calibrate the IWB using a pointer as necessary	29	44	23	15	2.78	0.98	High
6. I can connect to the internet through the IWB	14	35	36	26	2.33	0.97	Low

Table 1 showed that items 1, 3 and 6 are low since their mean value were 2.49, 2.29 and 2.33, thus, post-graduate student-teachers' extent of connectivity to IWB through those items are low; while items 2, 4 and 5 are high since the mean value were 2.67, 2.80 and 2.78 respectively, thus, post-graduate student-teachers' extent of connectivity to IWB through those items are high.

Research question 2: What are the post-graduate student-teachers' levels of competency in using IWB?

Table 2: Mean Analysis of the post-graduate student-teachers' levels of competency in using IWB in the 21st century classroom

Items	VHE	HE	LE	VLE	Mean	SD	Decision
1. I can flexibly write on the IWB with my finger or stylus	23	59	20	9	2.86	1.67	High
2. I can flexibly draw on the IWB with my finger or stylus	19	50	28	14	2.67	1.81	High
3. I can import learning multimedia contents from different applications on the computer or websites onto the IWB	21	26	39	25	2.39	1.03	Low
4. I can easily make notes on the IWB	13	44	39	15	2.49	0.87	Low
5. I can create lesson with digital and multimedia contents using IWB	22	22	38	29	2.33	1.06	Low
6. I can save my lesson for future use directly on the IWB	22	30	29	30	2.39	1.08	Low
7. I can print learning materials directly from the IWB	8	35	33	35	2.14	0.95	Low
8. I can manipulate text and images on the IWB	20	49	22	20	2.62	0.98	High
9. I can record learning sessions on the IWB for future use	15	26	38	32	2.22	1.01	Low
10. I can easily drag and drop objects or icons on the IWB	31	22	38	20	2.58	1.08	High
11. I can use IWB to accommodate learners' of different learning styles	8	44	40	19	2.37	0.85	Low
12. I can download video clips on the IWB to improve learners' understanding of concepts.	21	35	29	26	2.46	1.05	Low
13. I can email saved files as attachments to my course mates from the IWB.	15	43	23	30	2.39	1.02	Low
14. I can give my course mates feedback on their work while using IWB	14	28	24	45	2.09	1.07	Low
15. I can use IWB to showcase my presentations	34	41	25	11	2.88	0.96	High

Table 2 showed that items 1, 2, 8, 10 and 15 are high since their mean value were 2.86, 2.67 and 2.88, thus showing the areas where post-graduate student-teachers have high levels of competency in using IWB; while items 3, 4, 5, 6, 7, 9, 11, 12, 13 and 14 with mean value of 2.39, 2.49, 2.33, 2.39, 2.14, 2.22, 2.37, 2.46, 2.39 and 2.09 respectively, thus showing the areas where post-graduate student-teachers have low levels of competency in using IWB..

Null Hypothesis: There is no significant difference in the mean score of Master's student-teachers and PhD student-teachers in the extent to which they can connect to IWB, their levels of competency in using IWB, ways of using IWB, and the obstacles that may hinder their use of IWB in the 21st century classroom.

Table 3: Z-test Analysis of mean score of Master's student-teachers and PhD student-teachers

	No of Respondents	\bar{X}	SD	Df	$Z_{\text{calculated}}$	Z_{critical}	Result
Master	83	2.47	0.97	109	0.38	1.98	Not Significant
PhD	28	2.55	0.98				

Table 3 revealed that there is no significant difference in the mean score of Master's student-teachers and PhD student-teachers in the extent to which they can connect to IWB and their levels of competency in using IWB, since the $Z_{\text{calculated}}$ (0.38) is less than Z_{critical} (1.98) at df. of 109 and 0.05 level of significance. Therefore, the null hypothesis is accepted.

DISCUSSION OF FINDINGS

Table 1 finding confirmed that the extent to which post graduate student-teachers can connect to IWB by installing IWB driver software to their computer, connecting IWB to computer wirelessly via Bluetooth and connecting to the internet through the IWB is low. Meanwhile, the extent to which they can connect to IWB by connecting it to their computer using USB cable, connecting a digital projector to their computer in order to display computer images onto the IWB surface and calibrating the IWB using a pointer as necessary is high. Thus, post graduate student-teachers' extent of connectivity to IWB is low in some areas of IWB connection, and vice versa. This result indicates that post graduate student-teachers have not really been acquainted with technology behind IWB connectivity and cannot effectively connect to it in 21st century classroom. This result is in line with that of European School Net (2013) that revealed among others that many of the European schools are connected at the basic level to ICT.

In table 2, the finding proved that post-graduate student-teachers have high levels of competency in writing and drawing flexibly on the IWB with finger or stylus, manipulating text and images on the IWB, dragging and dropping objects or icons on the IWB, and showcasing their presentations using IWB. However, their competency levels in importing multimedia contents from different applications on the computer or websites onto the IWB, making notes easily on the IWB, creating lesson with digital and multimedia contents using IWB, saving lesson for future use directly on the IWB, printing learning materials directly from the IWB, recording learning sessions on the IWB for future use, using IWB to accommodate learners' of different learning styles, downloading video clips on the IWB to improve learners' understanding of concepts, emailing saved files as attachments to their course mates from the IWB, and giving their course mates feedback on their work while using IWB; is absolutely low. This finding indicates that post-graduate student-teachers in curriculum studies and Educational Technology are yet to be ready to integrate ICT (especially, IWB) into their classroom process since their level of competencies in using IWB to carry out the crucial parts of learning activities that engage learners in the learning process are not too satisfactory. This finding agrees with Serkan (2012) who found out that teachers' levels of competency in the use of IWB were not satisfactory.

The result in table 3 unveiled that there is no significant difference in the mean score of Master's student-teachers and PhD student-teachers in the extent to which they can connect to IWB and their levels of competency in using IWB. This result signifies that both Master's student-teachers and PhD student-teachers have similar competencies in using the IWB. This result agreed with the finding of European School Net (2013) that saw no significant

relationship existed between infrastructure provisional levels and student and teacher use, competency and attitudes.

CONCLUSION

This study have unveiled that post-graduate student-teachers have varying levels of competencies in using IWB since they have high competency levels in carrying out some activities and low competency levels in others. In the same vein, the extent to which they can connect to IWB varies. In all these, there is no significant difference in the mean score of Master's student-teachers and PhD student-teachers in the extent to which they can connect to IWB and their levels of competency in using IWB.

RECOMMENDATIONS

- ❖ Institutions that have installed IWB should provide technical staff that will always assist teachers in connecting to IWB and other digital devices.
- ❖ Government, educational administrators and other educational philanthropists should thoroughly equip schools with ICT tools (such as IWB, computers, projectors, internet connections, etc) so that student-teachers can utilize them to bring the expected learning outcome in today's learners.
- ❖ Teacher training institutions and schools should provide adequate training programs that will expose students-teachers (especially, at post graduate levels) to the use of IWB and other digital tools, since that is the main stay of education in this 21st century.

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