



Utilization of the Interactive Whiteboard Technology for Instructional Delivery in Technical and Vocational Education and Training Courses in South Eastern Universities in Nigeria

KEYWORDS

Interactive Whiteboard Technology, Instructional Delivery, Technical and Vocational Education and Training

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ABSTRACT

The study examined the extent of utilization of the interactive whiteboard technology (IWT) by Technical and Vocational Education and Training (TVET) lecturers in South-Eastern Universities in Nigeria. Existing literature revealed the importance of the IWT in the pedagogical system in other regions of the world. The study adopted survey research design. The population for the study was 105 TVET lecturers. Structured questionnaire was used for data collection. Three experts validated the instrument. The instrument had a Cronbach alpha reliability co-efficient of 0.78. The study found out that the TVET lecturers slightly possess required skills for the effective use of the IWT. Challenges facing effective use of the technology include unstable power supply and difficulties in learning the manipulation and operational skills. The study recommends the provision of constant power supply in the TVET workshops and laboratory by university authorities to encourage frequent use of the technology.

Introduction

The study focused on the utilization of the interactive whiteboard technology for teaching and learning in Technical and Vocational Education and Training (TVET) courses in South Eastern Universities in Nigeria. Educational attainment is recognized as one of the fundamental indicators of development of nations. To improve the quality and universality of a country's educational system, most countries try to include the use of Information and Communication Technologies (ICTs) in instructional delivery process in schools. ICTs are described as the integration of a variety of electronic tools that exchange information to enhance the quality of life that is unimpeded by location, time and distance (Rupert, 2012). ICTs facilitate the provision and presentation of learning content and the communication between teachers and learners (Avril, 2013). ICTs are used in instructional delivery methods of all school subjects including TVET courses. Technical and Vocational Education & Training (TVET) is a comprehensive term referring to those aspects of general educational processes that involve the study of technologies and related sciences, and the acquisition of practical skills, attitudes and knowledge relating to occupations in various sectors of economic and social life particularly as it pertains to the world of work (TVETipedia, 2013). TVET refers to all deliberate interventions created to make learners adequately productive in designated areas of economic activities and occupation (Karen, Jason & Annette, 2008). TVET describes the range of learning experiences which are relevant to the world of work (Abu & Seung, 2013). TVET learning experiences are enshrined in courses such as agricultural, business, computer, home economics, industrial/technical, music and art education, among others.

Students arrive at the university with different backgrounds, interests, and abilities. This means that a one-size-fits-all approach to instructional delivery could be ineffective and probably counterproductive. If the goal of content delivery is to provide an opportunity for all students to learn, then the instructional practices that teachers choose to employ in the classroom matters in order to successfully impact knowledge to the learners. The teacher uses multiple instructional materials, activities, strategies and assessment techniques to

meet students' needs (Walsh & Sattes, 2005). Instructional delivery is a process in which teachers apply a repertoire of strategies and patterns in the teaching and learning processes, to communicate and interact with students around academic content, and to support students' engagement (Virginia Department of Education, 2010). Since the aim of TVET is to produce competent manpower in a nation (Karen, Jason & Annette, 2008), institutions offering TVET courses especially universities therefore should aim at graduating employable students with high technical skills, as about 80% of jobs world-wide require vocational skills (Chinien & Kotsik, 2003). TVET education/training for employability places greater emphasis on learning, rather than on teaching. Most theories of learning emphasize the importance of engaging learners in activity based learning (Bransford, Brown, & Cocking, 1999). There are varieties of technologies designed to support learners' engagement in learning such as the interactive white board.

The interactive whiteboard technology is an instructional tool that allows computer images to be displayed onto a (touch sensitive) board using a projector. The information exchange mechanisms of the interactive whiteboard involve the use of hardware and software. The hardware include the white electronic-board, computer, speakers and a projector to display digital lesson materials in audio-visual form from video-discs (both analogue and digital), the internet and other data storage mediums linked to the computer. The software on the other hand include: internet browsers, word-processing applications, spreadsheets, desk-top publishing programmes and simulation applications (Bannister, 2010). The instructor can manipulate elements on the board by using the finger or a stylus (pen) as a mouse, directly on the screen. Items can be dragged, clicked and copied and notes can be written by hand, which can be transformed into text and/or slides. IWT is a powerful tool for interactivity and collaboration, integration of media contents into teaching and cooperative learning in the classroom. The use of the IWT and other pedagogical technology is to meet the needs of TVET especially as world of work moves from industrial age to information and technology era (Maja, David, Naing & Tapio, 2013). TVET teachers must be empowered on the

effective use of the technology in the classroom to ensure improvement in instructional delivery as it enhances teaching methods and learning styles (Majumdar, 2013).

Studies have shown that both teachers and students like the technology, students are more engaged and motivated to learn, shifts instruction from presentation to interaction and students' focus away from teachers onto content, makes course content delivery more student-centered (Cuthell, 2005; Miller, Glover & Averis, 2005; Painter, Whiting & Wolters, 2005; Dhindsa & Emran, 2006; Smith, Hardman & Higgins, 2006; Karen, Jason & Annette, 2008). To obtain the integration of ICT into the teaching-learning process, all ICT frontline staff should acquire the operational skills and understand how such educational technology can support pedagogy (Majumdar, 2013). Such skills include basic computer operation, power input-output understanding, multimedia creation and display, graph designing and the use of web tools (Bannister, 2010). However, the preparation of electronic notes for classroom use is difficult, time consuming plus the required skills are tactful and hard to learn (Smith et al 2006; Bannister, 2010). This could be why Bannister (2010) and Avril (2013) stated that in most schools where the IWT is available, they are not fully utilized, and in many cases acts as glorified blackboards. However the claim has not been verified empirically, in developing countries such as Nigeria especially in the South-Eastern region where the technology is available for instructional delivery of TVET courses. Thus the specific purpose of this study is to determine (1) the *required skills*, (2) the *extent of use*, and (3) the possible *challenges* facing the use of IWT in universities in the South-Eastern region of Nigeria.

Method

The study reviewed literature on the use of interactive whiteboard technology in various schools to provide information on the need and benefits of the technology in the pedagogical system. The study adopted descriptive survey research design and was carried out in five (5) public universities in the South-Eastern part of Nigeria that offer TVET courses and make use of the interactive whiteboard technology for instructional delivery. South-Eastern region of Nigeria comprises of the states in the South Eastern geopolitical zone of Nigeria, which include; Abia, Anambra, Ebonyi, Enugu and Imo states. These states are known to have private, state and federal government owned universities. The purposively chosen universities are: University of Nigeria, Nsukka (UNN), Enugu State University of Science and Technology, Enugu (ESUT), Nnamdi Azuikiwe University, Awka (UNIZIK), Ebonyi State University, Abakaliki (EBSU), and Michael Opkara University of Agriculture, Umudike (MOUUAU). The population for the study was 105 TVET lecturers drawn from the five universities as follows: UNN-34, UNIZIK-24, EBSU-23, ESUT-16 and MOUUAU-8. There was no sampling because of the manageable size of the population. Structured questionnaire was used for data collection and was divided into 3 sections based on the specific purposes of the study. Each item in the questionnaire was assigned a four response options of Very High Extent/Highly Possessed/Strongly Agree (VHE/HP/SA=4), High Extent/Average Possessed/Agree (HE/AP/S=3), Low Extent/Slightly Possessed (LE/SP/D=2) and Very Low Extent/Not Possessed (VLE/NP/SD=1) for research purposes 1/2/3 respectively. The instrument was validated by three experts at the Department of Vocational Teacher Education, University of Nigeria, Nsukka. Reliability of the instrument was determined using Cronbach alpha method which yielded 0.78. 105 copies of the research instrument were administered but 101 were returned and used for analysis. The study used the Statistical Package for Social Science (v20.0) for analysis. Statistical tools such as Mean (\bar{X}) and Standard Deviation (σ) were used. Mean real limit of numbers was used to interpret the result while standard deviation was used to validate the closeness of the respondents from each other in their responses and from the mean. Items with mean values: equal to or greater than 3.50 were regarded as VHE/HP/SA;

ranging from 2.50 – 3.49 as HE/AP/S; 1.50 – 2.49 as LE/SP/D; and equal to or less than 1.49 as VLE/NP/SD.

Results

Table 1
Mean ratings of TVET lecturers on the extent of utilization of the IWT for instructional delivery of TVET courses in South Eastern universities in Nigeria.
N=101

S/N	Extent of use of the interactive whiteboard technology	\bar{X}	σ	Re-mark
1.	In presentation of course content during lecture periods	1.50	0.55	LE
2.	During practical classes to show simulations	1.15	0.44	VLE
3.	During examination, to show exam questions	1.28	0.41	VLE
4.	During examination to show timer for exam duration	1.17	0.42	VLE
5.	Display of images and videos that are related to the topic being taught	1.48	0.47	VLE
6.	In recording and saving class activities during the lecture period to be replayed later for further discussion	1.19	0.50	VLE
7.	To involve students in interacting with games and other classroom learning activities found within the course content	1.20	0.41	VLE

Table 2
Mean ratings of TVET lecturers on the extent of possessed skills required for effective utilization of the IWT in instructional delivery in South Eastern universities in Nigeria.
N=101

S/N	Skill possession	\bar{X}	σ	Re-mark
1.	Power input-output connectivity skill	2.17	0.75	SP
2.	Basic computer appreciation skills	2.67	1.03	AP
3.	Multimedia creation and presentation skill	2.00	0.63	SP
4.	Graphical design skill	1.83	0.75	SP
5.	Word processing and document preparation skill	2.33	1.37	SP
6.	Slide preparation and presentation skill	2.17	0.75	SP
7.	On-the-board measurement, drawing, marking and highlighting skills	2.00	1.10	SP
8.	Internet browsing skill	2.83	0.98	AP
9.	Stylus (pen) handling and/or finger placement skill	2.17	1.17	SP
10.	Pedagogical software and application skills	1.83	0.75	SP
11.	Digital video/audio recording and editor application skills using the interactive whiteboard technology to create podcasts, record classroom activities for students continuous learning	1.67	0.82	SP
12.	Manipulative skills for efficient use of generic tools such as shape creators, spotlight, screen capture, magnifier, font and color changing, line tools, digital eraser and note taking	1.76	0.82	SP

Table 3
Mean ratings of TVET lecturers on the challenges inhibiting the effective use of the interactive whiteboard technology in instructional delivery of TVET courses in South Eastern universities in Nigeria
N=101

S/N	Challenges to effective use of the IWT	\bar{x}		Re-mark
1.	Unstable power supply interrupting continual use	3.83	0.41	SA
2.	Difficulty in learning the manipulation and operational skill	3.17	0.44	A
3.	Lack of experienced technicians to mount, maintain and repair the IWT	3.50	0.55	SA
4.	Difficulty in preparing electronic note for the course content	3.67	0.52	SA
5.	Problems with compatibility of some school/classroom computers with the IWT	3.50	0.56	SA
6.	Changing of slides/animations could be a source of distraction for the students	3.10	0.63	A
7.	Difficult to develop a good understanding of where to stand so as to be able to interact with the IWT efficiently whilst facing the audience	3.01	0.91	A
8.	Lack of guidance and face-to-face training sessions TVET lecturers from expert	3.23	0.60	A

Discussion of findings

Findings of the study in table 1 revealed that the IWT is poorly utilized by the TVET lecturers in the South-Eastern Universities in Nigeria. This finding follows that of Bannister (2010)

and Avril (2013) which stated that, in many universities where the whiteboards are available, they are poorly utilized and are more of glorified blackboards. The finding is not surprising as many lecturers in the studies universities lacked the skills to use the technology.

Findings in table 2 indicated that the TVET lecturers averagely possess the operational skills for the use of computers and web browsers but slightly possess the required skills for the effective use of the IWT. Such lacking skills include power input-output understanding, multimedia, graphical and the use of web tools for building teaching and learning systems among others, as outlined by Bannister (2010).

Findings in table 3 revealed that unstable power supply interrupting continual use, difficulty in learning the manipulation and operational skill and difficulty in preparing electronic note for the course content, and others are the challenges to effective use of the IWT in the South-Eastern Universities in Nigeria. These findings are in line with Smith et al (2006) and Bannister (2010) who stated that preparation of the electronic note for presentation is difficult and time consuming as well as learning the skills for the effective use of the IWT is tactful and hard to learning.

Conclusion and Recommendation

The study has identified the required skills, extent of use and the challenges facing the use of IWT in universities in the South-Eastern region of Nigeria. The study, thus recommends that; training sections should be organized for all TVET lecturers on the usage of the IWT in the classrooms; constant power supply be provided in the TVET workshops and laboratory by university authorities to encourage frequent use of the technology; TVET lecturers be encouraged by concerned authorities to use the IWT and other available pedagogical technologies during demonstration (simulations) of practical before field experience as this will reduce much emphasis on theories rather than practical as most TVET course are vocational and practically oriented in nature.

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