

## Information and Communication Technology Competencies Needed by Vocational and Technical Teachers for Effective Teaching in Technical Colleges in Federal Capital Territory, Abuja

BY

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### Abstract

*This study identified the Information and Communication Technology (ICT) Competencies needed by Vocational and Technical teachers for effective performance in Technical colleges in Federal Capital Territory (FCT), Abuja. The study adopted a descriptive survey research design which involves the use of questionnaire to determine the opinion and response of respondents. The target population for the study consists of 44 Vocational and Technical teachers that are ICT compliance in technical colleges in FCT and college education Zuba and 18 ICT Experts. The instrument for data collection was 30 items questionnaire; the instrument was validated by three experts in the Department of Industrial and Technology Education, Federal University of Technology Minna Niger State. Two research questions and two hypotheses guided the study. The questionnaire was administered on the respondents by the researcher in FCT. The data obtained were analyzed using frequency count, mean, standard deviation, and t-test statistics. The Null hypotheses were tested at 0.05 level of significance. The findings of the study shows that Vocational and Technical teachers needed ICT competencies such as word processor and power point for effective performance on their job. Consequently it was recommended among others that the ICT competencies identified should be developed and package for the training of the teachers.*

### Introduction

Information and communication technology (ICT) have become so wide and versatile and also an indispensable part of the contemporary world due to its predominant significance which globally in a number of ways affected the school framework. Educational institutions try to change the pattern of educational program and classroom facilities in order to enhance the teaching and learning process through ICT. The utilization of ICT is a powerful tool for presentation through, electronics white board, television, overhead projector, guided web tours where the students can simultaneously view the resources on visual display unit.

For Vocational and Technical teachers to function more effectively they need to develop not only fundamental computer skills but also proficiency in using a variety of computer applications programs such as the spreadsheet, Word processor, management presentation tools like the Power point and design productivity tools like the Computer aided design. Teachers must develop basic Computer abilities and skills as well as capability in utilizing an assortment of Computer applications programs to tackle issues on education, and produce new knowledge that will enhance learning process. This restructuring process requires effective integration of computer technologies into existing context in order to provide the teacher with the knowledge of specific subject areas to improve meaningful learning to aid vocational productivity, the development of these skills and other basic areas of knowledge is the responsibility of the schools, institution and their instructional staff. But yet many teachers and educators lack the necessary skills to be comfortable in playing a leadership role in the integration of computer technology into classrooms. Yusuf (2005) pointed out that in order to achieve the good purpose of education; ICT is an essential ingredient that could help bring these profited gain and benefits to technical colleges. It contains the broadest sense of any action identified with the handling, control, administration, exchange of data among media. Bucher, (2003) defines ICT as electronic technology for collecting, storing, processing, and communicating information. It incorporates the Computer component and programming, the system and a few different gadgets, for example, feature, sound, photographic cam, projector, and so forth that changes over data like content, pictures, and sound movement into normal computerized structure. Information and communication technology provide an atmosphere and unique environment in electronic communication system through which teachers and student can enlarge their share of cognitive set.

ICT does not depend or bring about changes in communication and information technology only but also changes the way of reasoning of mankind and how he view the society and the world at large. Awolowo (2004) affirmed that there is no doubt that Nigeria has not had its own share of technological development in every system in the nation most especially the educational system. It must be noted that ICT is one of the means to amend not something that is profoundly changing education, but its impact is our major concern in vocational and technical colleges especially in teaching and learning processes.

The use of ICT will prepare Vocational and Technical teachers for the future and this will not only transform the school system but bring about a significant change in the teaching and learning process which will help them to define it professionally. In Nigeria the requirement for an overall qualified Teachers has pick up in light of the fact that it is viewed as that educator instruction which is a method for not just giving educators the vital abilities and learning, required to satisfactorily complete their showing occupations additionally for expert development. Vocational and Technical teachers' capabilities must be investigated so that their abilities can be reclassified to focus around the advancement of the entire life of man and training. Vocational and Technical teachers need to be competent in knowledge and skills on ICT to enhance their teaching practices. Gaynor (2003) defined competency as learning, aptitudes, demeanor, qualities, inspirations and convictions individuals require for effectiveness in work. In this way, teachers must have the fundamental learning, abilities, and essential involvement in ICT before they can be viewed as equipped in the application of ICT which incorporate any technology that serves to deliver, control, store, impart, and retrieve data. It implies that the ICT competency is critical to enhance the correspondence in the learning and educating methodology.

ICT abilities are situated of technology guidelines that characterize adequacy and capability in utilizing Computer application as part of the classroom for viable teaching. The procurement of information technology and abilities must be joined with the advancement of more extensive capabilities. Teaching is a complex activity, some teachers in technical colleges find it difficult to effectively tally their ICT instructional material, for example, Computers, sound, visual supports, slides, feature cuts, electronic white board and electronic conferencing material to the objective of their instructional goal which impel data and attribution detailing, that is the reason this investigation measured and inspected the path in which ICT instructional material utilized as a part of specialized schools are esteemed worthy and useful for the understudy scholastic accomplishments. The knowledge of ICT will empower the teachers to choose and get ready proper ICT instructional materials and utilized them in teaching and learning.

Keengwe (2007), pointed out that separated from the essentialness of possessed the capacity to express and foresee such instructional material usage skills which has prompted various studies especially from numerous instructive examination writing concerning ICT instructional materials use which demonstrate that ICT material use fitness have a tendency to differ with instructors. Anoa (2003), said that Teachers training is the procedure of preparing that arrangements with the craft of procuring proficient capabilities and expert development. Therefore Vocational and Technical teachers need to possess different ICT competencies in some basic areas of computer such as the applications software like spreadsheet, power point, computer aided design and word processing.

### **Statement of the Problem**

The present situation concerning competency of teachers on ICT in our technical colleges today is that teachers find it very difficult to integrate some of this application software such as power point, word processor, and computer aided design and spreadsheet with the rest of the curriculum, it is disturbing that Vocational and Technical teachers encounter different level barriers of poor ICT competence on the usage of Computer application software and also lack of confidence in teaching because they seems not to have understanding how to inculcate the applications software into the classroom for effective performance. The changing educational module systems, inside which teachers fabricate learning situations and exercises, are changing the way of teaching and learning. Bork (2008), state that ICT gadgets promote classroom understanding and discussion about difficult concepts especially through display of simulation. This speaks to the responses to the changing requests on instructive frameworks to answer national and worldwide issues, a large portion of which are brought about by, or identified with ICT trade use in the public. Hence, the need to identify the ICT competencies needed by vocational and technical teachers in teaching and learning process in technical college in FCT is paramount.

### **Purpose of the Study**

The main purpose of the study is to identify the ICT competencies needed by Vocational and Technical teachers for effective teaching in technical colleges in FCT. Specifically this study sought to identify:

1. Word processor competencies needed by Vocational and Technical teachers for effective teaching colleges
2. Power point competencies needed by Vocational and Technical teachers for effective teaching in technical colleges

### **Research Questions**

The following questions were developed to assist in carrying out the study

1. What are the word processor competencies needed by Vocational and Technical teachers for effective teaching in technical colleges?
2. What are the PowerPoint presentation competencies needed by Vocational and Technical teachers for effective teaching in technical colleges?

### **1.6 Hypotheses**

The following hypotheses were formulated and tested at 0.05 level of significance.

**H<sub>01</sub>:** There is no significance difference between the mean response of Vocational and Technical teachers that are ICT compliance and the ICT Lecturers/teachers on the Word Processor competency needed by Vocational and Technical teachers in technical colleges for effective teaching.

**H<sub>02</sub>:** There is no significance difference between the mean response of Vocational and Technical teachers and that are ICT compliance the ICT lecturers/teachers on the power point presentation competency needed by Vocational and Technical teachers in technical colleges for effective teaching.

### **Research Methodology**

The design of this study was a descriptive survey research design. It involved the use of a questionnaire to determine the opinion and responses of respondents. It gives room to the researchers to elicit information from respondents on ICT competencies needed by Vocational and Technical teachers for effective performance in technical colleges in Federal Capital Territory (FCT). This study was carried out in FCT. The target population for this study is 62 which comprised of 44 Vocational and Technical teachers/lecturers that are ICT compliance and 18 ICT teachers/lecturers in the two technical colleges and FCT College of Education, Zuba in FCT. The entire population was used for the study. The instrument for data collection was 30 items questionnaire. The instrument was validated by three ICT experts in Federal University of Technology Minna, Niger State. The data collected was analyzed using mean standard deviation and t-test statistical tools.

### **Results**

#### **Research question and Hypothesis 1**

What are the word processor competencies needed by Vocational and Technical teachers for effective teaching in technical colleges?

**Table 1: Mean responses and t-test analysis of the respondents on the word processor competencies needed by Vocational and Technical teachers for effective teaching in technical colleges in FCT. (N<sub>1</sub> = 44; N<sub>2</sub> = 18)**

S/n	Item	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_A$	SD <sub>1</sub>	SD <sub>2</sub>	T- cal	Remarks
	Ability to:							
1.	Set page breaks and print area on Microsoft word	3.85	3.72	3.79	0.12	0.68	1.43	N, NS
2.	View a document in page break view	2.65	1.37	2.01	0.88	0.65	6.12	NN, S
3.	Format data: font, size, color, and style on Microsoft word	3.12	3.49	3.31	0.95	0.72	-1.63	N, NS
4.	Copy web text properly into word processor	3.10	3.64	3.37	0.73	0.37	-3.27	N,S
5.	Organize table and chart using word processor	2.81	3.19	3.00	1.06	0.76	-1.52	N, NS
6.	Design student handout using word processor	3.64	3.10	3.37	0.97	0.37	2.51	N S
7.	Use multimedia portfolio such as s lide projector with Microsoft word	3.19	3.70	3.44	0.75	0.00	-3.13	N NS
8.	Scale, move, and rotate objects using pointer device (mouse)	2.80	3.66	3.23	1.14	0.47	-3.36	N, NS
9.	Insert an equation and symbol into word document	2.60	3.73	3.17	0.84	0.37	-5.98	N, NS
10.	Use smart art to create timeline on the Microsoft word environment	3.13	3.65	3.39	0.76	0.94	2.34	N, S
11.	Insert an equation and symbol into a word document	2.97	3.65	3.39	1.10	0.90	-2.56	N, NS
12.	Use of print preview properly using Microsoft word window	2.97	3.47	3.22	1.07	0.94	-1.91	NS, N
13.	Use smart art to create cause effect diagrams like pyramid	2.70	3.30	3.00	1.17	0.40	-2.31	N, NS
14.	Use table function to design t-chart in word processor	3.10	3.64	3.37	0.73	0.37	-2.86	N, NS
15.	Use feature like cursor control, spelling checker for text	3.19	3.70	3.44	1.12	0.77	-7.06	N, NS
Grand mean ( $\bar{X}_g$ )				3.23				

**Key:** N<sub>1</sub> = number of Vocational and technical teachers/lecturers that are ICT compliance; SD<sub>1</sub> = Standard Deviation of Vocational and technical teachers/lecturers that are ICT compliance; N<sub>2</sub> = ICT teachers/lecturers;

$\bar{X}_1$  = mean of Vocational and technical teachers/lecturers that are ICT compliance;  $\bar{X}_2$  = mean of ICT teachers/lecturers; SD<sub>2</sub> = Standard Deviation of ICT lecturers;  $\bar{X}_A$  = Average Mean; N= Needed; NN = Not Needed; NS = Not Significance; S = significance

The data presented in table 1 revealed that the respondents agreed with item 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 with a mean score ranging from 3.0 to 3.44 and disagree with item 2 with mean score of 2.01. Since their grand mean (3.23) is above the cut-off point of 2.50, the respondents agreed

that all the items except items 2 are the word processor competencies needed by Vocational and Technical teachers for effective performance in technical colleges. The table shows that the standard deviation (SD) of the items ranges from 0.00 to 1.17 which was below 1.99. This indicated that the respondents are not far from the mean and one another to their responses. This also indicated that the items are valid

Table 1 also reveals that items 1, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14 and 15 had their t-calculated values greater than t – critical value of 1.99 at .05 level of significant indicating that there is significance difference between the opinions of Vocational and Technical teachers and ICT experts. Hence, null hypotheses were rejected for these items. While the null hypotheses for item 2, 6 and 10 were accepted since their t-calculated value is less than t-critical value of 1.99 at .05 level of significance, indicating that there is no significance difference between the opinion of the two respondents on the word processor competencies needed by Vocational and Technical teachers for effective performance in technical and colleges.

**Research question II and Hypothesis II**

What are the power point competencies needed by Vocational and Technical teachers for effective teaching in technical colleges?

**Table 2: Mean responses and t – test analysis of the respondents on the power point competencies needed by Vocational and Technical teachers for effective teaching in technical colleges in FCT. (N<sub>1</sub>= 44; N<sub>2</sub> = 18)**

S/N	Item	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_A$	SD <sub>1</sub>	SD <sub>2</sub>	T- cal	Remarks
16.	Ability to: Convert any presentation into a web page using power point	3.67	3.41	3.54	0.29	0.34	3.42	N,S
17.	Add graphics and picture to a slide on the power point window	3.41	3.90	3.66	0.73	0.37	-2.96	N,NS
18.	Format data: font, size, color, and style of text	3.98	3.87	3.93	1.12	0.77	0.42	N, NS
19.	Copy web text into power point environment	3.50	3.70	3.60	0.95	0.72	-0.88	N, NS
20.	Organize images and pictures with different effect on power point	3.75	3.70	3.73	0.07	0.80	2.93	N,S
21.	Design presentation using animation and transition on image and text	3.45	3.15	3.30	0.74	0.34	-0.59	N NS
22.	Make bulleted list slide on the power point window	3.40	3.42	3.41	0.96	0.40	-2.44	N, NS
23.	Use slide layout for power point presentation	3.88	3.90	3.89	0.96	0.75	-0.61	N, NS
24.	Use effect and transition on object and images	2.22	2.47	2.35	0.68	0.67	0.35	NN, NS
25.	Integrate the use of animation scheme during presentation using power point	3.41	3.32	3.37	0.84	0.37	-5.98	N, NS
26.	Use slide master for different slide show effect during presentation	3.9	3.90	3.93	0.12	0.68	1.43	N, NS
27.	Use feature like cursor control, spelling and grammar checker effectively	3.38	3.00	3.19	0.88	0.65	6.12	N,S
28.	Manipulate power point viewer	3.00	3.33	3.17	0.76	0.94	2.34	N,S
29.	Open multiple worksheet for presentation	2.32	2.17	2.26	0.88	0.75	0.84	NN NS
30.	Open power point slide show using command	1.79	1.83	1.81	0.82	0.71	-2.19	NN, NS
Grand mean ( $\bar{X}_g$ )		3.28						N, NS

**Key:**  $N_1$  = number of Vocational and technical teachers/lecturers that are ICT compliance;  $N_2$  = ICT teachers/lecturers;  $\bar{X}_1$  = mean of Vocational and technical teachers/lecturers that are ICT compliance;  $\bar{X}_2$  = mean of ICT teachers/lecturers;  $\bar{X}_A$  = Average Mean; N= Needed; NN = Not Needed ; NS = Not Significance; S = significance

The data presented on table 2 revealed that the respondents agreed with item 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, and 13, with mean score ranges from 3.30 to 3.37 and disagree with item 9, 14, and 15 with mean score ranging between 1.81 and 2.35 respectively. Since the grand mean (3.28) is above the cut-off point of 2.50, all the respondents agreed that the items except item 9, 14 and 15 are the PowerPoint presentation competencies needed by Vocational and Technical teachers for effective performance in technical colleges. The table shows that the standard deviation (SD) of the items ranges from 0.07 to 1.12 which was below 1.19. This indicated that the respondent adopt too far from the mean and one another on their responses. This also indicated that the item were valid.

Table 2 also reveals that items 2, 3, 4, 6, 7, 8, 9, 10, 11, 14 and 15 had their t calculated value greater than t critical value of 1.99 at 0.05 level of significance indicating that there is significance difference between the opinion of Vocational and Technical teachers and ICT experts. Hence, the null hypotheses were rejected for these items. While the null hypotheses for items 1, 5, 12 and 13 were accepted since their t-calculated value is less than t-critical value of 1.99 at 0.05 level of significant indicating that there is no significance different between the opinion of the two respondents on the PowerPoint Presentation competencies needed by Vocational and Technical teachers for effective performance in technical colleges.

### Discussion of findings

The result of the study identified setting of page breaks and print area on Microsoft word, Formatting of data: font, size, color, and style on Microsoft word, Copying of web text properly into word processor, Using of multimedia portfolio such as slide projector with Microsoft word, Using of smart art to create cause effect diagrams like pyramid, Using of feature like cursor control, spelling checker for text and among others as word processing competencies needed by Vocational and Technical teachers for effective performance in technical colleges. The result also identified ability to Convert any presentation into a web page using power point, Add graphics and picture to a slide on the power point window, Design presentation using animation and transition on image and text, Open power point slide show using command and among others as power point presentation competencies needed by Vocational and Technical teachers for effective performance in technical colleges

Mogire (2013) carried out a study on factors affecting use of computers in teaching and learning mathematics in secondary schools in Kisii central district, Kenya. The study findings indicated that there was minimal use of computers in teaching and learning of Mathematics due to lack of Mathematics software, fewer computers per school, lack of computer skills by teachers and students, power blackouts and inadequate computer laboratory space to accommodate mathematics students Creed, (2006) affirm that it is equally possible that the hardship faced by the institution and their inability to meet the demand to develop effective and proficient ICT literate in teaching cadre is as a result of corrupt practices by both the federal and state government officials and the regulatory bodies and also the officials of teachers education institution the greatest problem faced by the technical and vocational institution is inadequate computers and facilities. Several researches have indicated that teachers' lack of knowledge and skills have become primary factors in failure of a computer technology integration program in the institution (Mouza, 2003; Kathriner, 2007). Many teachers can only operate basic computer programs although the computers they use can provide them with more advanced facility (Doherty & Orlofsky, 2001). The lack of time is also often considered as a problem by teachers in their technology mediated teaching (Granger, Morbey, Lotherington, Owston & Wideman, 2002). They are often loaded with too many teaching hours or other activities outside their teaching responsibility, so they hardly have time to plan, prepare and develop their technology mediated teaching (Kathriner, 2007). In fact, preparing to teach with technology, Kathriner argues, usually requires longer time than the teaching without technology.

The absence of adequate help or technical support to facilitate teachers' technology mediated teaching is

another factor which may hinder teachers' teaching. Granger et al. (2002), based on the findings of their study about factors contributing to teachers' success in implementing the technology mediated teaching, revealed that many teachers, when having some difficulties with the technology equipment being used, had to give up using it because there was no one available to help deal with the problems. ICT has the capacity to provide higher interactive potential for users to develop their individual, intellectual and creative ability are the main purpose of ICT it is involve in the development of human mental resources which allow people to both successfully apply the existing knowledge and produce new knowledge.

The hypotheses tested were accepted, they show that there is no significance difference between the mean responses vocational and Technical teachers and ICT experts on the word processor and power point presentation competencies needed by vocational and technical teachers for effective performance which will help also in promoting computer literacy among them and also enable student to take full advantage of information and communication technology which is necessary for facilitating effective teaching and learning Marshall, (2002) stated that many different types of technology can be used to support and enhance learning. Starting from video content and digital movies to laptop computing and handheld technologies has been used in classrooms. Similarly, new uses of technology such as pod-casting are constantly emerging. Various technologies delivered different kinds of content and serve different purposes in the classroom. Power point programs promote organizational skills; and modeling software promotes the understanding of science and mathematics concept. It is the teachers who need to bring about the required changes in their attitude and approach to ICT. Iyamu and Ogiegbaen (2005) argued that the exorbitant price of the computer hard ware and software make it difficult for individual to purchase it. Whereas , in the developed countries the computer hardware and software are cheap therefore very affordable more so the large number of the public schools coupled with inadequate infrastructure such as classroom and cost of software like the Corel draw and auto cad software, printer, disk, paper make it difficult for most technical colleges in Nigeria to posses these ICT facilities.

### Conclusion

ICT is a tool necessary to bring about a positive outlook in our educational system. The future of the education depends solely on the teachers. They have some needs which have to be constructively looked into by the government, curriculum planners; there are three major needs of the Vocational and Technical teacher; availability and accessibility of ICT hardware and software, ICT gadget and training on how to use software/hardware and ICT gadget. If Vocational and Technical teachers can be provided with the necessary materials and duly trained, it will facilitate the future teaching and learning process of our society.

### Recommendations

With important roles ICT play in effective teaching and learning process, it is necessary for everyone in the field of education not to see ICT use, literacy, accessibility and availability, training and integration in curriculum as an optional skill but must be a necessary tool for development

To be able to attain this goal, the following recommendations are offered:

1. The government should provide and make available computer and ICT software in every in technical colleges FCT
2. The competencies identified should be packaged for the training and retraining of vocational and technical teachers in technical colleges

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