

Capacity Building Needs of Technoteachers in the Use of Computer for Effective Teaching of Electrical/Electronic Courses in Colleges of Education in South Eastern, Nigeria

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Abstract

This study determined the capacity building needs of electrical/electronic teachers in the use computers for effective teaching of electrical/electronic courses in colleges of education in southeastern, Nigeria. Three research questions guided the study. Descriptive research design was adopted for the study. The population was 109 technoteachers. A – 50 item questionnaire was developed for gathering data. The questionnaire was validated by three Experts. Cronbach alpha reliability method was used for determining the internal consistency of the instrument with a coefficient value of 0.82. one hundred and nine copies of the questionnaire were administered to the respondents, but 102 copies were collected back which represented 93.57percent return rate. It was found out that technoteachers need capacity building in the use of the computer for effective teaching of electrical/electronic courses in colleges of education. Recommendations include that the identified competencies where teachers need capacity building in the use of the computer for effective teaching in colleges of education should be packaged into a training programme and be utilized retraining the teachers through workshops and seminars.

Introduction

Computer is a programmable machine that receives input, stores and manipulates data, and provides output in a useful format. It is an electronic machine that accepts input (data), processes it and gives out results (information). Computer according to Akukwe (2003) is an electronic device that is capable of accepting, storing, processing information (almost at the speed of light) following a set of predefined instructions (program) and outputting the result of the processing in the way the user wants it, for other machines, computers and people to make use of if need be. According to Alegbemi (2010) computer is a programmable device that performs mathematical calculations and logical operations, especially one that can process, store and retrieve large amounts of data very quickly. Olaitan and Dada (2009) also

described the computer as an electronic device which consists of a central processing unit (CPU), a monitor, a keyboard and a mouse and touch pad. Two principal characteristics of a computer according Webopedia (2010) are; it responds to a specific set of instructions in a well-defined manner and can execute a prerecorded list of instructions. Computers play a significant role in industries, social, political and most especially in education. There is hardly any human activity where computer has not made impact.

It makes work easy for people, saves time, has less fatigue, serves as interface between the users and the internet and also useful in the teaching and learning process. The computer and the internet complement the functions of each other for the success of every activity that man engages in. In teaching, the computer is important in many

ways. Olaitan and Dada (2009) outlined this importance to include: Inputting, processing and storing data and information about the inputs, process and products of instruction; retrieving the stored information through downloading and printing; and manipulating data in order to achieve the desired educational objectives. The computer and the internet have become vital parts of teaching and learning in a number of ways. Knowledge and experiences are gained through them, having a vital influence on the technoteachers and the learners' behaviour and awareness.

A teacher is an individual who is trained in pedagogy and technical area of a particular subject to impart knowledge, skills and attitudes to students. Teacher according to Encarta (2009) is somebody who teaches especially as a profession. Technoteacher is an individual who professionally teaches technical or technology subjects in a school. According to the Report of Technoteacher Association (2010) a technoteacher is an individual who teaches technology or technical subjects to his or her students. Bakare and Ochepo (2010) stated that technoteachers are found in the teaching of both vocational and technical education subjects and courses. In the context of this study, a technoteacher is a person who has been trained professionally in the art of teaching technology or technical courses in automobile technology, building technology, electrical/electronic technology and woodwork technology to students in colleges of education.

Teaching is the process of assisting an individual to acquire knowledge, skill and attitude through instruction. Ogwo and Oranu (2006) viewed teaching as the science and art of assisting a person to learn. The authors stated further that the science of teaching involves the use of acquired knowledge from natural and behavioural sciences in order to help appreciate the circumstance and personality of the learner while the art aspect

of teaching involves the use of creative and administrative skills in aiding delivery of instruction. Olaitan, Alaribe and Nwobu (2010) added that teaching is the process of helping an individual to learn through instruction. Teaching in the context of this study is the process of assisting students learn the content of technology curriculum in colleges of education through instruction by the teacher with the aid of computer.

College of Education is a three year tertiary level of learning that helps to prepare teachers in different areas such as agriculture, business and technical. Colleges of education, according to Ellah (2007), are tertiary educational institutions that prepare intermediate level teachers for a minimum of three years to make them qualify to teach their respective subjects. They are under the control of the National Commissions for Colleges of Education (NCCE) which uses the minimum standard to monitor the implementation of programmes of the colleges.

In order to impart knowledge, skills and attitudes to students in all these areas, the teachers require the use of the computers to plan, organize, implement and evaluate instruction for certification of the learners and benefit of the society.

The researchers have observed that technoteachers in the study area are faced with many problems in the use of the computer for effective instructions and delivery. These problems include: the levels of computer training received by the teachers through adhoc programmes extended to them by community members are grossly inadequate; lack of practice after training due to high capital involved in acquiring the computer and its accessories.

This low level of the knowledge of computer application by technoteachers results into more learning problems than solving them. These problems range from inaccuracy of information storage and retrieval of data on students, errors in curriculum planning,

teaching strategies and assessment of knowledge. This situation has caused embarrassment to parents who have no accurate information on the levels of their children performance, date of resumption, absence of medical records, absence of records on money paid and debts owed and misinformation on the subjects offered by students and those on whose grades are credited.

Technoteachers are usually targets of the errors by parents and adjudged as very incompetent in doing their jobs when compared with the output and efficiency of past manual teachers when computer was not yet in use. These teachers also found it very difficult to use computer to perform their personal work such as typing their document and analyzing data for their research studies. To solve these problems and to correct the perception of the society about these teachers and also to minimize human errors through the computer that is regarded as “cabbage in cabbage out,” the technoteachers need capacity building.

Capacity building in the opinion of Ann (1996) is a process of developing and strengthening the skills, instincts, abilities, process and resources that teachers need for them to survive, adapt and thrive in the fast changing world of technology. Ukonze and Olaitan also said that capacity building involves improving the capacity of teachers in imparting appropriate knowledge, skills and attitude to the students to achieve the set goals and objectives. In this study, capacity building will involve the retraining of technoteachers in the operation of the computer and access to the internet and their appropriate applications to learning in schools in order to reduce to the barest minimum obvious problems associated with lack of adequate exposure and training of teachers in the use of computer in schools. The purpose of this study therefore was to determine the capacity building needs of technoteachers in the use of computers for

effective teaching of electrical/electronic courses in colleges of education in south eastern, Nigeria. Specifically, the study sought to identify:

1. Competencies required in operating the computer effectively.
2. Competencies required in using the computer to access internet
3. Competencies required in solving problems arising from the use of computer and the internet.

Research Questions

The following research questions guided the study:

1. What are the competencies required in operating the computer effectively?
2. What are the competencies required in using the computer to access internet?
3. What are the competencies required in solving problems arising from the use of computer and the internet?

Method

A descriptive research design was adopted for this study. Survey design, according to Olaitan, Ali, Eyo and Sowande (2002), is the plan, structure and strategy that the investigator wants to adopt in order to obtain solution to research problems using questionnaire in collecting, analyzing and interpreting the data. This study was carried out in south eastern, Nigeria comprising Enugu, Anambra, Ebonyi, Imo and Abia State.

The populating of the study was 109 Technoteachers drawn from six randomly sampled Colleges of Education in the Zone. The population was small and therefore, the entire population constituted the sample; hence no sampling technique was adopted.

A – 60 item questionnaire was developed based on the research questions and was used for data collection. The questionnaire had two response categories of needed and performance with four rating scales each. The Needed category had Highly

Needed (HN) = 4; Averagely Needed (AN) = 3; Slightly Needed (SN) = 2 and Not Needed (NN) = 1. The performance category had High Performance (HP) = 4; Average Performance (AP) = 3; Low Performance (LP) = 2 and No Performance (NP) = 1 respectively.

Three experts validated the instrument; three in Industrial Technical Education Department, University of Nigeria Nsukka. Their views were utilized to fine tune the questionnaire which was tested for reliability using Split-half technique and Cronbach alpha method that yielded a coefficient of 0.82. One hundred and nine copies of the questionnaire were administered to the respondents with the help of trained Research Assistants who are conversant with the terrains of the study area. The instruments were collected with 93.57 percent retrieval and improvement need index (INI) was used to answer the research questions.

To determine the capacity building need gap, the following procedure was adopted:

1. The weighted mean of each item under the needed category (X_n) was calculated.
2. The weighed mean of each item under the performance category (X_p) was also calculated.

3. The difference between the two weighted means for each item ($X_n - X_p$) was determined.
4. The decision rules were as follows:
 - a. A zero (0) value indicates no capacity building needed because the level at which the item was needed is equal to the level at which the respondents can perform it.
 - b. A positive (+) value indicates capacity building needed because the level at which the item was needed is higher than the level at which the respondents can perform it and.
 - c. A negative (-) value indicates no capacity building needed because the level at which the item was needed is lower than the level at which the respondents can perform it.

Results

Results for this study were obtained from the research questions answered through data collected and analyzed.

Research Question 1

What are the competencies in operating the computer where teachers need capacity building for effective teaching?

The data for answering research question 1 are presented in Table 1.

Table 1

Performance Gap Analysis of the Mean ratings of the Responses of the Technoteachers on Competencies Needed for Operating the Computer for Effective Teaching (N = 102)

S/NO	Item Statements	Xn	Xp	PG (Xn-Xp)	RMKS
1	Identify computer tower, monitor, keyboard and printer	2.23	2.47	-0.24	*
2	Launch and close programs	3.41	3.03	0.38	**
3	Recognize icons on toolbars	3.11	2.54	0.57	**
4	Demonstrates acceptable behavior at the computer and in the lab	2.87	2.33	0.54	**
5	Manipulate a mouse proficiently	3.22	2.38	0.84	**
6	Demonstrate ability on computer, sign onto the network, restart, and shutdown	3.18	2.44	0.74	**
7	Demonstrate ability to start and end a program	2.66	2.10	0.56	**
8	Demonstrate ability to print student projects / work	2.44	2.02	0.42	**
9	Use the server to save and retrieve student work	3.27	2.47	0.80	**
10	Use formal keyboarding skills with home keys and correct posture	2.74	2.22	0.52	**
11	Touch type 10-15 words per minute	3.10	2.20	0.90	**
12	Use paint or drawing tools changing colours, shapes, and size to create a graphic	2.37	2.00	0.37	**
13	Demonstrates word processing skills	3.33	2.48	0.85	**
14	Change the margins, line spacing and use bullets	3.29	2.26	1.03	**
15	Highlight and make specific changes to highlighted text including deletion/moving / copy – pasting	3.11	2.13	0.98	**
16	Create and use indents, tabs, change margins, line spacing and use bullets in a word document	3.19	2.37	0.82	**
17	Students will use word to create an essay or report	3.44	2.34	1.10	**
18	Import and export graphics and applying rotating, move, stretch and shrink effects	3.28	2.22	1.06	**
19	Use thesaurus function	2.97	2.23	0.74	**
20	Ability to insert photos into project	3.66	2.38	1.28	**
21	Create a short power point presentation using pictures, text, sound, and animation	3.28	2.43	0.85	**
22	Introduction to basic charts and graphs in excel	2.77	2.44	0.33	**
23	Understand basic spreadsheet vocabulary	3.45	3.00	0.45	**
24	Use technology tools (e.g., multimedia authoring and presentation)	2.66	2.12	0.54	**

- Capacity building not needed

** Capacity building needed

The data in Table 1 revealed that the performance gap of the respondents in 23 out of 24 item were positive. The values ranged from 0.33 to 1.28. The performance gap values indicate that technoteachers in colleges of education need capacity building in the use of the computer to enable them teach effectively. The performance gap of item one is negative. It has the value of -0.24 indicating

that technoteachers do not require capacity building in this item.

Research Question 2

What are the competencies needed by technoteachers in using the computer and internet where they require capacity building for effective teaching?

The data for answering research question2 are presented on Table 2.

Table 2

Performance Gap Analysis of the Mean Ratings of Responses of the Technoteachers on Competencies for using the Computer with the Internet where they require Capacity Building for Effective Teaching (N = 102)

S/NO	Item Statements	X _n	X _p	PG (X _n -X _p)	RMKS
1	Log on and off the network	3.42	2.31	1.11	**
2	Organize and delete student's personal files on the server	3.01	2.34	0.67	**
3	Properly download files from internet to student's own folder	3.24	1.88	1.36	**
4	Can save and organize files for various software applications	2.37	2.05	0.32	**
5	Demonstrate an advanced ability to navigate between websites	3.45	1.56	1.89	**
6	Understand basic ethics of computer and internet use	3.06	2.35	0.71	**
7	Use the internet for basic research; citing electronic sources	3.43	2.11	1.32	**
8	Evaluate the accuracy, relevance, appropriateness, and bias of electronic information sources	3.55	1.94	1.61	**
9	Understand basic internet URL addresses and basic extensions	3.43	2.11	1.32	**
10	Demonstrates understanding and respects copyright laws	3.67	2.44	1.23	**
11	Identify and use accurate and appropriate information resources	2.23	1.87	1.43	**
12	Use Blogs and other forms of web communication; such as email, Polycom, online discussions.	3.35	2.34	1.01	**

** Capacity Building Needed

The data in Table 2 revealed that the performance gap of the respondents in all the twelve items were positive. The performance gap values ranged from 0.32 to 1.89. This implies that technoteachers need capacity building in all the competencies required for using the computer and the internet for effective teaching in colleges of education.

Research Question 3

What are the competencies required by technoteachers where capacity Building is needed for solving problems in computer and internet operation for effective teaching.

The data for answering research question3 are presented in Table 3.

Table 3

Performance Gap Analysis of the Mean Ratings of responses of the Technoteachers on Competencies Needed in Solving Problems in Computer and Internet Operations for Effective Teaching
(N = 102)

S/NO	Item Statements: ability to solve	Xn	Xp	PG (Xn-Xp)	RMKS
1	PC won't start up or shut down	3.34	2.33	1.01	**
2	The computer randomly hands and crashes	3.55	2.43	1.12	**
3	The system shuts down or reboots without warning	2.83	1.66	1.17	**
4	Computer Accessories e.g Printers, monitors, keyboards, won't function properly.	3.22	2.45	0.82	**
5	System not receiving electrical power	2.90	2.32	0.58	**
6	Equipment fails to be recognized by PC before, during, or after installation	2.88	1.57	1.31	**
7	Hardware refuses to run at some point after initial setup.	3.54	3.11	0.43	**
8	Programs won't install, nor appear on your computer, or hang when you run them (or randomly crash to desktop)	3.00	2.34	0.66	**
9	Conflicts between devices appear in Windows XP or Windows Vista	3.28	2.54	0.74	**
10	Technical glitches mar programs' performance	3.14	2.88	0.26	**
11	You are unable to connect to the Internet	3.22	2.19	1.03	**
12	You experience a severe system slowdown	2.77	2.10	0.67	**
13	The computer is unusually warm continuously	3.10	2.74	0.36	**
14	Power light on the front of the computer is blinking rapidly				**

** Capacity Building Needed

The data in Table 3 revealed that all the performance gap values of the 14 items were positive. The performance gap values ranged from 0.26 to 1.31. This implies that technoteachers need capacity building in solving the problems of computer and internet operation for effective teaching in colleges of education.

Discussion of Results

It was found out that technoteachers needed capacity building in operating computer, using the computer with the internet and solving problems arising from the use of the computer and internet in teaching technical courses. This result is in agreement with Miller, Bakare and Ikatule (2010) who conducted research on professional capacity building needs of teachers for effective teaching of basic technology curriculum to students in junior secondary schools in Lagos State. The authors found out that teachers of

basic technology needed capacity building in planning, implementing and evaluating instruction, classroom/ laboratory management and in teaching contents of basic technology curriculum to students in junior secondary schools.

The results of this study was also in agreement with the finding of Ebaye (2007) who in a study carried out on competency improvement needs of automobile mechanics teachers in technical colleges in Cross river and Akwa Ibom States, Nigeria. The author found out that the teachers needed improvement in knowledge of subject matter, use of instructional methods, communication skills, laboratory and classroom management and evaluation.

The findings of the above authors help to validate to the finding of this study on capacity building needs of technoteachers in the use of computer for effective teaching of

in colleges of education in south west zone of Nigeria.

Conclusion

From the results of this study it was discovered that technoteachers in colleges of education in south west zone of Nigeria needed capacity building in areas of computer application, use of computer and the internet and solving problems arising from the use of the computer and internet for effective teaching of electrical/electronic courses. Giving capacity building to these teachers in the above areas will help them to overcome some of the inadequacies outlined in the introduction to this study.

It is therefore recommended that the identified competencies where technoteachers need capacity building for effective teaching of electrical/electronic courses in colleges of education should be packaged into a training programme and be utilized for retraining the teachers through workshops and seminars.

REFERENCES

- Akukwe, A. C. (2003). *Computer studies: An introduction*. Owerri: Career Publishers.
- Alegbemi, R. (2010). *Computer*. Retrieved on 19/08/2010 from www.wikipediacomputer.com
- Ann, D. (1996). *Capacity Building in Social Justice Organization*, Ford Foundation. Deborah Linneli Published by the Alliance for nonprofit management
- Ebaye (2007) *Competency Improvement Needs of Automobile Mechanics Teachers in Technical Colleges in Cross River and Akwa Ibom states*. An Unpublished M.Ed Project Submitted to the Department of Vocational Teacher Education, University of Nigeria, Nsukka
- Ellah, B.I. (2007). Effectiveness of Quality Assurance Curriculum frame factors on Implementation of Agricultural Education Programme of Colleges of Education in Eastern Nigeria. *An Unpublished Ph.D Thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka*.
- Miller, I.O. Bakare, J.A. & Ikatule, R.O. (2010). Professional Capacity Building Needs of Teachers for effective Teaching of Basic Technology Curriculum to Students in Junior Secondary Schools in Lagos State. *A Paper presented at the Annual National Conference of curriculum organization of Nigeria held at Ebonyi State University*.
- Olaitan, S. O. & Dada, A (2009). *Farm Tools, Equipment and Machines in the Tropics*. Unpublished Manuscripts.
- Olaitan, S. O., Ali A., Eyo E. O. & Sowande K. G. (2000) *Research Skills in Education and Social Science*. Owerri: Cape Publishers International Ltd.
- Olaitan, S. O., Alaribe, M. O. & Nwobu, V.I. (2010). Capacity Building Needs of Teachers for Effective Teaching of Agriculture Curriculum in Upper basic schools in Abia state. *A Paper presented at the 12th Annual National Conference of Nigerian Association of Educational Researchers and Evaluators (NAERE) on Educational Reforms and Human Capital Development*

Ogwo, B. A. and Oranu, R.N. (2006). *Methodology in Formal and Non Formal Technical and Vocational Education*. Enugu: University of Nigeria, Nsukka.

Technoteachers Association.(2010). *What is Technoteachers?* Retrieved on 20/09/2010 from www.ieeexplore.ieee.org/xplore/login.jsp?url.

Ukonze, J. A. & Olaitan, S. O. (2009) *professional competency – capacity building needs of teachers for effective teaching of agricultural science in Anambra State*. Paper presented at the 11th Annual Conference of Nigerian Association of Educational Researchers and Evaluators on Educational Research and School Supervision. July 8th to 11th 2009.

Webopedia (2010). *Characteristics of a Computer*. Retrieved on 20/09/2010 from www.webopediacomputerxeristics.org.url