E-Teaching Competencies for Capacity-Building of Lecturers for Effective Delivery of Vocational Oriented Courses in the Universities

Abstract

This paper determined the e-teaching competencies for capacity building needs of lecturers for effective delivery of vocational oriented programmes in the universities. Three research questions guided the study. The study made use of survey research design. It was carried out in south west states of Nigeria. The population for the study was 105 lecturers of technical education and computer education. A self developed 44 competency item, questionnaire was used for data collection and it was validated by three experts. Cronbach Alpha reliability method was used to determine the internal consistency of the instrument while the reliability coefficient of 0.82 was obtained. One hundred and five copies of questionnaire were administered to the respondents by the researchers while 101 copies of the questionnaire were returned and analyzed using Mean and Improvement Need Index (INI) to answer the research questions. It was found out that those lecturers of technical education needed capacity building in the operating computer, up loading of text on the internet and videoconferencing for e-teaching in universities. It is therefore recommended that the findings of this study be packaged and used for retraining lecturers of technical education through seminars, workshops or shot duration courses on e- teaching for effective delivery of technical education courses in the universities..

Keywords: Capacity-building, Technical Education Lecturers, e-teaching, Instructional delivery, Teacher training

Introduction and Background to the Study

Nigerian government has made a quite number of efforts, to make Nigerian educational system one of the best in the world. Some of the efforts made by the government include: provision of e-teaching resources, digital classrooms and laboratories and centers for effective e-teaching and networking of Nigerian universities (Ogbuanya & Bakare, 2017). A university is the degree awarding institution mandated to train individuals to be responsible citizens. People become good citizens by acquiring university education and other non-degree awarding institutions.

Education therefore is regarded as the only instrument for national development (Federal Government of Nigeria, 2014). Universities in Nigeria are usually owned by individuals, group of individuals or religious bodies, state and federal government. Activities such as

teaching, researching and community development are carried out by lecturers in Nigerian universities (Pediaa, 2016).

Lecturers are people who hold qualifications to teach in tertiary institutions. Bakare (2014) defined lecturers as academic staff within the programme with minimum qualification of first degree not below second class honours lower division. These academic staff is responsible for the implementation of educational programmes. Lecturers are the hubs or pivots on which educational programmes revolve. Some of the lecturers also perform community development. Unlike a teacher's, lecturer's students are mostly adults and these students are capable of modifying their behavior, taking responsibilities and finding extra resources (Pediaa, 2016). A university lecturer holds postgraduate qualifications (Master degrees and PhDs) as well as possesses research experience. A lecturer, in this context, is the individual who teaches adult students and carries out research in technical and vocational education. The lecturer is expected to adopt e-teaching for delivery of vocational education to students. Apart from developing the critical competencies and knowledge, 21 century lecturers are expected to uphold high standards, lead by example, integrity, responsibility, be ethical in behavior and actions and actively valuing diversity (Ogbuuanya & Bakare, 2017). Lecturers need to acquire ICT competencies or skills in order to keep their jobs and to turn out products that can compete with their peers globally. As stated by OECD (Organization for Economic Co-operation and Development) (2013), the demands for skills towards more sophisticated tasks suggest that individuals with poor 21 century skills are more likely to find themselves at risk of unemployment and social exclusion. One of the requirements for lecturers to keep and cope with their jobs in the 21st century is to adopt e-teaching.

E-teaching is the use of computer, internet and other electronic equipment to transfer knowledge and skills from a teacher to a learner(s). It is a 21st century instructional platform or concept, which involves teachers managing a convergence of digital information from a wide range of sources and devices when presenting, discussing and reflecting upon a concept with a class group. Carmona (1996) stated that e-teaching involves the use of information and communication technologies (ICTs) to enhance the art of teaching. Asogwa, Olaitan and Abu (2012) stated that e-teaching involves harnessing the potential of digital technology in presenting a concept, placing the concept in various contexts, creating links with existing knowledge and leading discussion that probe students understanding of the concept and its context. In the view of Naidu (2006), e-teaching is commonly referred to as intentional use of networked information and communication technology teaching by the teacher. It

incorporates all educational activities carried out by a teacher online or offline via networked or standalone computers and other electronic devices to enhance teaching to students. In e-teaching, electronics are left to extending the reach information from individual to entire groups either large or small (Ogbuanya & Bakare, 2017). For example, smart phones, computers, ipads, electronic interactive white boards among other are essential tools in transition of e-teaching. These devices are effective media for the teacher in presenting information to the whole class. Glover and Milla (2002) stated that the important feature of e-teaching is its similarity to the multi-media, sensory and faceted styles which makes it a multi- literacy teaching and learning environment standard. McCormick and Scrimshaw (2001) observed that e-teaching makes teaching available everywhere and every time; it makes teaching cheaper and authenticated. According to the author e-teaching is modifiable, enhanceable and can be in embedded resources such as e-text books. It is fun and intention holding especially when used among children. In the same vein, Allen and Seaman (2008) stated the e-teaching enables a lecturer to repeat a lesson to different groups of students at different times and locations. It reduces delivery cycle for lecturers and lowers expenses incurred at each period of their service delivery. In the view of Nagy (2008), e-teaching enables a teacher to reach students in different schools at their locations in his teaching and practice using relevant technology devices. In this study, e-teaching refers to the activities carried out by lecturer in harnessing the potential of information and communication technologies for implementing instruction for students to take their learning in relevant direction.

A lecturer of vocational education is expected to adopt e-teaching for instructional delivery of technical and computing education programmes to students namely automobile, building, metalwork, electrical electronic, woodwork technology, business education and computer education. Lecturers of vocational and technical education teach these programmes to students individually within their universities based on their teaching competence; therefore, sharing of knowledge, meaning and best practices from lectures by students other than those from their universities are only possible through printed journals and text books. This practice gave rise to a variety of students with different standards in industrial vocational and technical education. The difference in standard calls for a compelling alternative that will help to minimize variations in the level of knowledge and competence of graduates of industrial vocational and technical education in teaching secondary schools students using

uniform curriculum in basic technology, business and ICTs. The use of e-teaching could be a good alternative but the lecturers must be competent in operating e-teaching facilities.

Competence is the combination of knowledge, skills and attitudes required for carrying out a task. Competency, in the explanation of Ely (1989) means essential knowledge and skills obtained in a profession. Lecturers as professionals are expected to possess and demonstrate at optimal level of acquisition and functioning. Hamiton in Olaitan (2003) referred to competency as knowledge, skills and attitudes that are required for successful performance of a task. Competency as applied in this study is the knowledge, skills and attitudes that lecturers of vocational and technical education must possess to operate e-teaching facilities for effective delivery of basic technology concepts. Most of lecturers of vocational and technical education cannot effectively operate e-teaching facilities such as computer for typing and editing of materials, uploading materials into internet and make video conferencing. They only manage to use projector and whiteboard during their teaching process. Asogwa (2011) pointed out that lecturers in universities were not as skilled and thorough in the understanding operation and application of ICT packages as they are supposed to. According to the author, many lecturers are still not good at booting their laptops, composing and sending e-mails, accessing mails, attaching files and other peripheral issues. This implies that for lecturers of vocational and technical education to be able to utilize e-teaching effectively, they need capacity-building to enhance their teaching competencies. However, it is important to find out the competencies required for building the capacity of the lecturers.

Capacity is the ability of individuals, institutions, and societies to perform functions, solve problems and achieve the set objectives in a sustainable manner. One tends to perform better when he is or her capacity is fully developed or built. Capacity-building is a retraining given to serving workers to develop a certain skill or competence, or for general upgrading of performance ability. Capacity building as contained in the report of Catholic Relief Service (2009), is an ongoing process through which individuals, groups, organizations and societies enhance their ability to identify and meet development challenges. Capacity building requires the development of conditions that allow individual participants to build and enhance existing knowledge and skills. Capacity- building remains one of the most challenging functions of development. The fundamental goal of capacity building is to enhance the ability of individuals based on perceived needs. Miller, Bakare and Ikatule (2010) described capacity building as the process of developing and strengthening the skills, instincts, abilities,

processes and resources that organizations and communities need to survive, adapt, and thrive in the fast-changing world. Capacity building therefore refers to organized activities directed towards improving competencies and capacities of technical education lecturers of Nigerian universities for using e-teaching facilities for effective instructional delivery. In order to improve the capacity of the lecturers, the skills they required for operating e-teaching facilities must be identified through needs assessment.

Assessment, in the opinion of Palomba and Benta (1999) is the systematic collection, review and use of information about educational programmes undertaken for the purpose of improving learning and development. Okoro (2000) defined assessment as a form of evaluation that uses collected data for estimating the quality or effectiveness of a programme or project. With reference to this study, assessment is the process of evaluating lecturers of vocational and technical education in universities through collection of data from them to determine the level of competencies they possess in operating computer, uploading materials on internet and operating computer using video conferencing for effective delivery, The level of competencies they possess in the aforementioned e-teaching facilities can be identified through need gap. Anaekwe (2007) refers to need as a shortfall between what is available and what is expected. Osinem and Nwoji (2010) opined that need may arise anytime an actual condition differs from a desired condition in the human or people or aspect of organization performance. Need gap, as explained by Chuta (1992) is what one requires in order to meet a target standard. Roselt and Sheldon (2001) explained that need gap is the difference between the perceived need and actual need. In this study, the difference between the perceived level of competencies possessed by lecturers and what they are required to meet acceptable standard of performance constitute the need gap which is meant be to filled. Therefore, the purpose of this study was to determine the e-teaching competencies required for capacity building of lecturers of technical education for effective delivery in universities in south west Nigeria. Specifically, the study sought to identify competencies required by the lecturers for:

L Operating computer;
2. Up-loading text on internet
3. video-conferencing Method

The below research questions guide the study:

- ✓ What are the computer operation competencies that lecturers of technical education and computer science education need capacity building for in using e-teaching?
- ✓ What are the internet operation competencies that lecturers of technical education and computer science education need capacity building for using e-teaching?

- ✓ What are the video conference competencies that lecturers of technical education and computer science education need capacity building for using e-teaching?

Methodology

The study adopted survey research design. Olaitan, Ali, Eyo and Sowande (2000) stated that survey research design 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. Questionnaire was used to collect data from lecturers for the study; The study was carried out in South-western of Nigeria covering federal and state universities.

The population for the study was 105 subjects made up of 76 lecturers of technical education and 29 lecturers of computer science education in the above Universities. There was no sampling due to the manageable size of the population. A 43-competency item questionnaire was developed from literature reviewed and functions of the industry and used for data collection. The questionnaire was divided into two components of needed and performance. The needed component was assigned 4-point response options of highly needed (4), average needed (3), slightly needed (2) and not needed (I), while the performance component was assigned a 4- point response options of highly performance (HP), average performance (AV), Low performance (LP) and no performance (NP) with corresponding value of 4, 3, 2, and I respectively. The lecturers of both technical education and computer science education responded to the two components (Needed and Performance). Three experts validated the instrument, two from Department of Science and Technology under School of Education University of Lagos Akoka and one from Computer and Robotic Education Department, Tai Solarin University of education Ijagun via Ijebu-ode Ogun State. Their corrections and suggestions were used to develop the final copy of the instrument. Cronbach Alpha reliability method was used to determine the internal consistency of the questionnaire. A reliability coefficient of 0.82 was obtained. One hundred and five copies of the questionnaire were administered to the respondents by the researchers. However, one hundred and one copies of the questionnaire were returned and analyzed using weighted mean and improvement need index (INI) to answer the research questions. The weighted mean was calculated based on the following:

$$\frac{N1 + N2 + N3 + \cdots}{No\ of\ Needs} ==> Weighted\ mean\ for\ Xn$$

$$\frac{P1 + P2 + P3 + \cdots}{No\ of\ Performances} ==> Weighted\ mean\ for\ Xp$$

[Key: Where N stands for needed component grade while P stands for performance component grade]

To determine the performance gap of the lecturers of technical education and computer science education the following steps were taken:

I. The weighted mean of each item under the need component which is Xn was calculated

2. The weighted mean of each items under the performance component which is Xp was calculated

3. The difference between the two weighted mean for each item (Xn-Xp = NG) was determined.

a. Where the difference (NG) was zero (0) for each item, there was no need for capacity building because the level at which the competency item was needed was equal to the level at which the lecturers could perform the competency.

b. Where the difference (NG) was negative (-) for each item, there was no need for capacity building because the level at which the competency item was needed was lower than the level at which the lecturers could perform the competency.

c. Where the difference (NG) was positive (+) for each item the lecturers needed capacity building because the level at which the competency item was needed was higher than the level at which the lecturers could perform the competency

Analysis and Result

Table 1: Performance Gape-Analysis of Technical Education and Computer Science Education Lecturers on operating computers competencies

S?N	Item Statement (Ability to)	Xn	Xp	Xn-Xp =(PG)	Remarks
1	Position computer and its accessories on a comfortable desk or table	3.19	3.24	-0.05	CBNN

2	Connect computer to the accessories with cables appropriately	3.62	3.12	0.5	CBN
3	Connect computer and accessories to power supply	3.47	2.32	1.15	CBN
4	Boot on the computer and switch on the accessories	3.61	2.9	0.71	CBN
5	Take a comfortable sitting position clode to the keyboard	3.56	3.19	0.37	CBN
6	Take cursor to the start menu	3.62	2.51	1.11	CBN
7	Click on open programmes from the start menu	3.73	3.45	0.28	CBN
8	Extend hand straight to the keyboard and let fingers lightly touch the home row and keys	3.55	3.01	0.54	CBN
9	Create a document from the Microsoft Office	3.78	3.38	0.4	CBN
10	Stroke the keys and the space bar with finger tips to type alphabet	3.65	2.05	1.6	CBN
11	Edit text using cursor movement, key page up and down, alpha numerical	3.74	2.45	1.29	CBN
12	Create a file or folder	3.51	3.12	0.39	CBN
13	Save the text in a file or folder	3.56	2.88	0.68	CBN
14	Insert CD plate or flash drive in the appropriate opening	3.79	3.5	0.29	CBN
15	Format CD plate or flash drive	3.67	3.34	0.33	CBN
16	Save / transfer text from one folder to the storage facility	3.67	3.34	0.33	CBN
17	Close the file or folder after use	3.56	3.32	0.24	CBN
18	Shut down computer after use	3.76	3.44	0.32	CBN
19	Switch off all the accessories	3.55	3.22	0.33	CBN
20	Disengage computer and accessories from power supply	3.89	2.79	1.1	CBN

Xn- Mean of needed, Xp-Mean of performance, CBN- Capacity building needed, CBNN – Capacity building not needed

The table 1 shows Performance Gap-Analysis of mean ratings of the responses of lecturers of Technical Education and Computer Science Education on computer operation competencies. The table reveals that lecturers of technical Education and Computer Science Education need capacity building, for e-teaching. The table 1 also answered the first research question raised that says "What are the computer operation competencies that lecturers of technical education and computer science education need capacity building in using e-teaching?"

The data in Table 1 revealed that the performance gap values of 19 out of 20 items ranged from 0.24 to 1 .60 and were positive. This indicated that the lecturers needed capacity building in the 19 competency items for operating computer for e-teaching in the universities. One out of the 20 items had a performance gap value of -0.05, indicating that the lecturers do not need capacity building on the item because the level at which the item is needed was lower than the level at which the lecturers could perform the item for e-teaching activities in the universities.

Table 2: Performance Gape-Analysis of Technical Education and Computer Science Education Lecturers on internet operation competencies

S?N	Competency Item Statement (Ability to)	Xn	Xp	Xn-Xp =(PG)	Remarks
1	Connect all necessary cables to computer including source of power supply	2.5	2.98	-0.48	CBNN
2	Boot the computer correctly	3.98	3.6	0.38	CBN
3	Decide on how the material will be organized (e.g title, subject matter)	3.6	3.11	0.49	CBN
4	Create a temporary file/folder by opening window explorer	3.6	3.02	0.58	CBN
5	File the text pages in a folder appropriately	3.74	2.89	0.85	CBN

6	Connect computer to internet service provider	3.8	3.24	0.56	CBN
7	Design web page for entering and formatting text, images, tables and other features	3.94	3.31	0.63	CBN
8	Search for a good navigation system (search engine) that users can easily get from place to place	3.56	3	0.56	CBN
9	Create a document from Microsoft Office	3.78	3.38	0.4	CBN
10	Log on a programme on the internet to File Transfer Protocol (FTP)address and login permission	3.78	3	0.78	CBN
11	Send / transfer text from folder to online locayion using identified search engine	3.66	3.05	0.61	CBN
12	Download the text to ensure accurate or effective uploading	3.54	3.25	0.29	CBN
13	Edit/change configuration of local site if need be	3.78	2.28	1.5	CBN
14	Disconnect from seach engine on the internet	3.67	3.21	0.46	CBN

Xn- Mean of needed, Xp-Mean of performance, CBN- Capacity building needed, CBNN – Capacity building not needed

Table 2 shows Performance Gap-Analysis of mean ratings of the responses of lecturers of technical Education and computer science education on internet operation competencies where lecturers of Technical Education and computer science education need capacity: building for e-teaching. This table 2 ansered the second research question raised in this study that says “What are the internet operation competencies that lecturers of technical education and computer science education need capacity building for using e-teaching?”

The data in Table 2 revealed that the performance gap values for 13 items ranged from 0.29 to 1.5 and were positive except one which has negative value of -0.48. This is indicated that the lecturers of technical education and computer science education need capacity building in the 13 competency items for uploading text on internet for e-teaching in the universities,

Table 3: Performance Gape-Analysis of Technical Education and Computer Science Education Lecturers on video conference competencies

S?N	Item Statement (Ability to)	Xn	Xp	Xn-Xp =(PG)	Remarks
1	Choose a software program for the video conferencing such as Logitech, Quick Cam Camera software, Microsoft Instant messenger, friend finders	3.59	3.23	0.36	CBN
2	Install video conferencing program appropriately	3.66	2.06	1.6	CBN
3	Connect computer to internet / online	3.86	2.23	1.63	CBN
4	Click the start menu to locate the installed program	3.56	2.05	1.51	CBN
5	Start the instant messenger	3.56	3.04	0.52	CBN
6	Search for friends online to connect for testing	3.61	2.97	0.64	CBN
7	Schedule time table for video conferencing with students / lecturers	3.5	3.02	0.48	CBN
8	Start video conferencing at the appropriate time as scheduled	3.45	2.65	0.8	CBN
9	Close programs at the end of the conference	2.56	3.21	-0.65	CBNN
10	Disconnect from the internet service provider after teaching	3.65	3.1	0.55	CBN
11	Shut down computer and disengage from power supply	3.78	3.03	0.75	CBN

Xn- Mean of needed, Xp-Mean of performance, CBN- Capacity building needed, CBNN – Capacity building not needed

Table 3 shows Performance Gap Analysis of mean responses of lecturers of technical education and computer education on video conference competencies where lecturers of technical education and computer science education need capacity building for e-teaching universities. Table 3 answered the research question raised in this study that says “What are the video conference competencies that lecturers of technical education and computer science education need capacity building for using e-teaching?”

The data in Table 3 revealed that the performance gap values for 10 items ranged from 0.36 to 1.63 and were positive except item 9 which has negative value of -0.65. This indicated that the lecturers of technical education and computer science education need capacity building in the virtually all competency items in video conferenci.for e-teaching in Universities.

Discussion of Findings

The result of this study showed that lecturers of technical education and computer science education need capacity building on 19 competency item in operating computer, 13 in operating internet and 10 on video conferencing for effective e-teaching in the Universities. The findings of this study are in agreement with the assertion of Ogwo and Oranu (2006) who stated that teacher must be continuous learners through, improvement programmes. This will ensure that lecturers are retrained to enhance their effectiveness in performing specific teaching activities. The findings of the study also agreed with the finding of Qlelewe and Okwor (2017) that using ICT supported strategies for teaching improves learning outcome of students and make the teaching easier for teachers. The result of this study shows that majority of the lecturers of technical education in the universities needed capacity building for effective operation of computer, uploading text on internet and using teleconferencing for effective e-teaching. Another implication of this finding is that lecturers of technical education are deficient in using e-teaching approach and relevant facilities that could support e-teaching of technical education courses to students in tertiary institutions. The findings of Miller, Bakare and Ikatule (2010) on professional capacity building needs of teachers for effective teaching of technology curriculum to students in junior' secondary schools in Lagos State, found that teachers of basic technology need capacity building in planning, implementing and evaluating instruction, classroom/laboratory management and in teaching contents of basic technology curriculum to student in junior secondary schools.

The result of this study is in consonance with the finding of Olaitan, Osinern, Honyonyon and Akeju (2008) in a study carried out on performance competencies required by lecturers for application of micro computer for the teaching of agriculture in college of education in south West Nigeria. The authors found that lecturers required performance competencies in using computer for teaching of some areas of agriculture, operating computer and in applying computer to agriculture through the internet, e-mail and Microsoft power point. lfeanyi Eze and Olaitan (2009) in a study on the requisite skills required for capacity building of teachers of agricultural education for effective teaching of yam production in Colleges of Education in South eastern Nigeria, found that teachers of Agriculture needed capacity building in 9 skills in each of pre-planting and planting operations 16 skills in post planting operation, 13 in processing and storage and 15 in delivering instruction to students. The observation and findings of the author in their various studies helped to validate the finding of this study.

These findings of the study could be attributed to the fact that lecturers of technical education and computer science education are not regularly trained by using ICTs such as laptops, Ipads, smart phones, internet, electronic interactive boards, email and digital projectors for teaching and learning purposes. This low level of ICT skills possessed by lecturers could be attributed to the perceived inadequate ICT training and orientation given to faculty members on ICT related equipment such as interactive whiteboard, starboards, computer among others (Ertmer 1999; Jegede 2009). The findings of the study also agree with the finding of Olelewe and Okwor (2017) that majority of the lecturers in tertiary institution possess low ICT skills required for effective utilization of IWB in their teaching and learning practices. These findings are also in line with the finding of Adirika and Alike (2008) that technologies such as computer, email, cell phones, e-teaching facilities, Ipads among others are yet to be used for teaching of school subjects due to inadequate skill possessed by the lecturers.

Conclusion

The lecturers of technical education and computer science education possessed low or lacked competencies in utilizing e-teaching platform for educational purposes. Their capacities need to be built for effective use of e-teaching facilities. It is therefore imperative to determine the capacity building needs of lecturers of technical education and computer science education in e-teaching for effective delivery as this could be used to improve the utilization of e-teaching in tertiary institutions

6. Recommendations

Based on the findings of this study, the researchers presented the following recommendations::

I. The identified competency items should be packaged into a retraining programme and used to organize seminars or workshops for lecturers of vocational based courses in other forms of educational institutions.

2. Governments at all levels, religious institutions and rich individuals can still donate facilities or equipment that could help continuity of e-teaching in schools and colleges

3. The management of universities should embark on regular capacity- building programmes in ICT-related areas to enable lecturers acquire.

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Appendix I

The Universities used include:

1. Ekiti state university Ado Ekiti, Ekiti Nigeria.
2. University of Lagos Akoka, Lagos State.
3. Tai Solarin University of education Ijagun Via Ijebu-ode Ogun State.
4. Federal University of Technology Akure Ondo State.
5. Adekunle Ajasin University Akanba Akoka Ondo State.
6. Osun State University Oshogbo.
7. Ladoke Akintola University of science and Technology Ogbomosho Oyo State.