Development and Implementation of E-Teaching Capacity Building Programme for University Lecturers in South Eastern Nigeria

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Abstract: The study developed E-teaching capacity building programme for capacity building of technical education lecturers of Nigerian universities. Seven research questions guided the study. The study adopted R & D research design. The population for the study was 204 lecturers of information technology/computer science in both state and federal universities, computer/ information technology specialists in the registered information technology industries and ICT trainers. Purposive random sampling technique was used to select experienced 204 computer and information and communication technology specialists. A structured questionnaire was used for data collection. The instrument was validated by five experts. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire item and 0.87 was obtained. Out of two hundred and four copies of the questionnaire administered on respondents with the help of three research assistants, only 201 copies were duly retrieved which represent 98.53% return rate. The data collected for answering research questions were analyzed using factor analysis and mean. The study found out that The findings of the study revealed that 15 objectives and 58 contents were suitable for the development of e-teaching capacity building programme. The findings of the study also revealed that the following number of instructional methods, training facilities and evaluation techniques were considered for implementing the e-teaching capacity building programme: instructional strategies 60, training facilities 21 and evaluation techniques 22.

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INTRODUCTION

Universities in Nigeria are known to be the apex of the institutions. They are tertiary institutions where teacher education is obtained. They are mandated to run varieties of degree programmes and produce professionals in different areas and fields of study. These institutions are under the control of the Nigerian Universities Commission (NUC) which uses the minimum standard to monitor the implementation of their programmes.

University education is the policies and procedures designed to equip prospective individuals with relevant knowledge, attitudes and skills they require to effectively carry out their tasks in the classrooms, laboratories, workshops, industries, school and wider community. The current trend of globalization requires that universities should be equipped to produce graduates with skills and competencies to develop learners as critical citizens in a digital world. For Nigerian universities to compete with other world-class universities in other parts of the world there is need for informing lecturers for effective implementation of their programmes. The quality of programme implementation and graduates depend on the types of competent and erudite academics staff on ground. University lecturers need to be retrained to effectively implement various educational programmes that will develop high quality personnel with the experience and determination to deliver high quality teaching and learning in a sustainable and inspiring manner supported by innovative research and technology.

Apart from developing the critical competencies and knowledge, 21st-century teachers are expected to uphold high standards, led by example, integrity, responsibility, be ethical in behaviour and actions and actively valuing diversity. Teachers everywhere in the world have been acknowledged as molders of human resources required for social, political and economic development. Universities should, in addition to academic and professional skills inculcate workplace skills such as creativity; problem solving; collaborative skills and higher order thinking skills, in order to increase the student's flexibility and job mobility. This will make them acceptable to the present and envisaged changes. This cannot be achieved if adequate attention is not paid to the issues of quality teaching and instructional delivery in universities where higher education is obtained. E-teaching capacity building programme could be developed to prepare universities lecturers for quality teaching and effective implementation of distance learning programmes.

Capacity building refers to the set of activities directed towards improving competencies and capacities of lecturers of universities in operating E-teaching facilities for effective instructional delivery. Lecturers in Universities are academic staff imparting knowledge, skills and competence to students. These academic staffs need E-teaching competence to impart necessary knowledge and skills. 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. E-teaching is a new and evolving concept, 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. E-teaching process and application include web-based teaching, computer-based teaching, video conferencing and digital collaboration. It incorporates all educational activities carried out by a teacher(s) online or offline via networked or standalone computers and other electronic devices to enhance teaching to students.

E-teaching differs from the conventional approach of teaching. In E-teaching, technology devices are left to extending the reach information from individual to entire groups either large or small. E-teaching according to Amherst involves computational systems that communicate and cooperate with learners at many levels. The author further explained that these systems might use the World Wide Web or CD/DVD-ROM and asynchronous learning environments to provide lectures outside the classroom. In the same vein, Umass, stated that much of the machine teaching research in computer science is multi-disciplinary with strong ties to research in cognitive science, education, engineering and to other computer science researchers in artificial intelligence, networking, machine learning, information retrieval and multimedia.

Moreover, computers, electronic whiteboards among others are essential tools in the transition of E-teaching. These devices are effective medium for the academic staff presenting information to the whole class. 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. It makes teaching available everywhere and every time. E-teaching makes teaching cheaper and authenticated. E-teaching is modifiable, effective and can be in embedded resources such as E-textbooks. It enables a teacher to reach students in different schools at their locations in his teaching and practice using relevant technology devices. 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. E-teaching could be adopted by academic staffs of Universities in Nigeria. Millions of students can be reached at different locations conveniently by a teacher using E-teaching approach. Teaching degree students by using E-teaching platform will help in effective implementation of school subjects or courses. Training of academic staff using E-teaching capacity building programme will expose them to the professional competencies in teaching and application of e-teaching facilities such as computers, high-tech phones, ipads among others for instructional planning, organising, implementing and evaluation of instruction.

A programme is a systematically planned work that gives details and step-by-step procedures of how to do a task or an event or a set of information and /or instructions. Programme development is an ongoing systematic process that Universal Web-Extension

professionals follow as they plan, implement and evaluate their educational programmes. The developed programme can be used to build the capacity of lecturers of higher learning such as colleges of education, polytechnics and universities in the country. The scope may be different but the principles of programme development remain the same. The need for development of programmes in technology education has been recognized worldwide as a means of developing human resources for better technological consumption, efficiency and increased productivity. Anaekwe stated that training gaps create learning opportunities that can be bridged by proper design of manpower training programmes. The development of the required knowledge, skills and attitudes of lecturers fore-teaching capacity building programme can be attained through training programmes.

Training programmes are integral parts of E-teaching curriculum development process. According to Offorma[1], the activities of programme development stemmed from curriculum development process, the essence of which is to map out what ought to be covered within a stipulated period and at a certain level of education. It is in this conception of curriculum that the E-teaching programme will be developed. The process of programme development involve certain procedures which include; the identification of objectives of the programme to be developed, the contents of the programme, the instructional methods, learning experiences and the required evaluation activities of the programme[1].

Objectives are specific and concise statements about who will make what change by how much, where and when[2-15]. They are brief, clear statements that describe the desired learning outcomes of instruction; that is, the specific skills, values and attitudes lecturers should exhibit that reflect the broader goals[2]. Developmental objectives of an E-teaching programme for lecturers is concerned with more complex teaching outcomes and those teaching tasks on which lecturers can be expected to demonstrate in varying degrees of progress. This can mostly be achieved through effective exploitation of specific contents of the programme.

Content refers to subject and subject matter taught to learners so as to achieve curriculum objectives or educational objectives. Content of programme development can be divided into the three domains of knowledge: skills, attitudes and values. When teaching for knowledge, the teacher can use a variety of methods with the goal of getting the learner to actively engage in learning the material. When teaching skills, the teacher needs to demonstrate and point out important aspects, supervise the student doing the skill or teach the student through the skill. When teaching about attitudes, the teacher needs to use methods that require the application of the attitude in particular situations[15-20]. In the context

of this study, E-teaching programme are those steps embedded in skills, attitudes and knowledge towards achieving E-teaching capacity building goals for lecturers for proficiency in teaching with electronic communication facilities in this global era. The proficiency in any teaching and learning situation depends on the appropriateness of the/or teaching instructional methods used.

Teaching methods are ways through which lesson contents in any teaching activity are delivered to the students by the teacher. According to Barnstein[3, 20-25], instructional methods are techniques adopted by a teacher to deliver or impact knowledge to the students. The author reported further that teaching methods are designed to be as interactive as possible, emphasizing small group work using relevant and practical case studies. An important part of any teaching experience is the quality of the relationship between learners and teachers. Instructional method for E-teaching programme is primarily the descriptions of the teaching objective-oriented activities and flow of information among students[25-30]. This can mostly be realized through careful selection and utilization of the required teaching experiences for achieving the stated instructional method.

Teaching experiences are important in teaching and learning situation for a number of reasons including scaffolding, effective curriculum and instructional delivery. Hence, Chase stated that most teachers, adults or children experience a number of teaching experiences over their lifetimes, everything from poor team experiences through a strongly influential teacher. Kolb shared that well specified teaching experience in any teaching and learning situation helps learners to make meaning from direct experience, i.e., "teaching from experience. Teaching experience for achieving instructional method can be most effective when efforts are made by the teachers to evaluate the performance of the students and the achievement of the stipulated objectives of the programme.

Evaluation as described by Wheeler in Kilzik is a powerful device in clarifying objectives such that the objective could either be modified or replaced with more properly planned ones. Onah[2] identified two types of evaluation. The two types of evaluation according to the author include formative and summative evaluation. If education is viewed as a process which seeks to change the behaviour of learners in the direction of objectives considered desirable, then evaluation may be conceived as the process of determining the nature and extent of these changes in the behaviour of learners after being exposed to objectives. Therefore, both types of evaluation apply to evaluation of student's achievement in a programme. In the context of this study, evaluation is the process of assessing the strengths and weaknesses of the programme including policies, personnel and products to

improve their effectiveness. In order to ensure the desired results of improved effectiveness of students (products) in E-teaching capacity building programme, the package must be subjected to validation by experts.

Validation is the process of establishing or confirming the ability of a research document or programme to solve the problem which it was designed to solve[25-30]. The validation by experts confirms the authenticity of the E-teaching programme for capacity building of university lecturers. When this is done and certified good enough for use, it can then be developed into a package for use. In this study, the E-teaching programme was packaged, validated and developed for capacity building of university lecturers in South-east, Nigeria for relevance in the present technological and global era. Validation by the experts needs computer lecturers and information technology expert that have work experience to ensure the authenticity of the programme.

Work experience refers to a specified period of time that an individual spends with an organization during which there is an opportunity to learn directly about work life and the working environment. Some work experience positions offer people the chance to try their hands at particular tasks, others simply provide an opportunity to watch and learn. However, an experienced staff in this study is a person that possesses knowledge and skills acquired through involvement in or exposure to something for eleven years or more while less experienced staff is a newly employed staff who has served for ten years or less. There is need to ascertain how these work experience positions will affect area of the study which is South-east of Nigeria.

However, South-east of Nigeria is made up of Abia, Anambra, Ebonyi, Enugu and Imo States. Before Nigeria became a country through British colonial government, the South-East was a part of the then Eastern Nigeria from where Rivers, Cross Rivers and Bayelsa States were carved out leaving the five Igbo speaking States that now constitute South-Eastern States. The five states (Abia, Anambra, Enugu, Ebonyi and Imo) also have a concentration of small number of other ethnic groups such as the Ijaw, Ibibio, Efik and Igala living within the area.

Given the concepts and the benefits of E-teaching and capacity building for university lecturers, E-teaching is crucial and important to lecturers in South-east Nigeria to enable the lecturers keep abreast, promote favourable competition among lecturers and respond to global challenges. However, this can only be attained when lecturers are equipped through training on various E-teaching skills. The essence of the E-teaching programme is to build capacity of lecturers to participate effectively in digital world.

Statement of the problem: In Nigeria, the capacity building of lecturers of the universities on E-teaching is yet to receive the desired level of attention from all levels of government. There has not been enough systematic attention to update regularly the knowledge and skills of the lecturers in the light of the changes in the curriculum and the wider society. This neglect has in turn affected the quality of scholarship in the school system most especially in universities. Most of the lecturers of universities cannot operate E-teaching facilities such as computers, Ipads, projectors, magic board/smart board, high-tech phones among others to perform instructional activities like E-lessons, E-resource, typing, editing and uploading of materials into the internet. They still plan their instructions using traditional methods. These teachers lack competencies in using E-teaching facilities to plan, organize, implement and evaluate instructions and assign grades to students and video conferencing. They also lack competence in using E-teaching facilities for reaching their students at different locations within and outside the university. Few of the lecturers only manage to use projectors to teach their students. E-teaching is a 21st-century teaching approach to equip students with modern skills and knowledge required for effective performance in the workplace. Most of the lecturers in the universities are still not as skilled and thorough in understanding the operation and application of ICT packages as they were supposed to be. Many of lecturers are still not good at booting their laptops, assessing, composing and sending emails, attaching files and other peripheral issues. This implies that for academic staff's of universities in Nigeria to be able to utilize E-teaching platform effectively, they must be retrained using empirical E-teaching capacity building programme.

The general purpose of the study was to develop E-teaching capacity building programme for lecturers in Universities in Nigeria. Specifically, the study achieved the following:

- Determine objectives of E-teaching capacity building programme
- Determine contents of e-teaching capacity building programme
- Identify facilities for e-teaching capacity building programme
- Identify instructional methods for implementing the E-teaching capacity building programme
- Determine evaluation techniques required for assessing E-teaching capacity building programme
- Determine motivational strategies required by trainers for enhancing their performance in training lecturers of universities
- Determine the effectiveness of the developed E-teaching programme

Research questions: The following research questions guided the study:

- What are the objectives of E-teaching capacity building programme?
- What are the contents of E-teaching capacity building programme?
- What are the training facilities for E-teaching capacity building programme?
- What are the instructional strategies for implementing the E-teaching capacity building programme?
- What are the evaluation techniques required for assessing E-teaching capacity building programme?
- What are the motivational strategies required by trainers for enhancing their performance in training lecturers?
- How effective is the developed E-teaching capacity building programme?

MATERIALS AND METHODS

Design of the study: The study adopted Research and Development (R & D) design. Gall *et al.*[4] described research and development as an industry-based development model in which the findings of the research are used to design new products and procedures which then are systematically field-tested, evaluated and refined until they meet specified criteria of effectiveness, quality, or standards. The R & D design was appropriate for this study because it aimed at the development of E-teaching capacity building programme for universities lecturers in South Eastern.

Area of the study: The area of the study was south eastern States of Nigeria made up of six States namely: Enugu, Anambra, Ebonyi, Imo and Abia States. Each of these States has two Universities with full time and part time programmes. Each of the universities in the study area also offers computer science programmes. This area of study is chosen because it has all the requirements for the proper conduct of this study.

Population for the study: The population for the study was 204 lecturers of information technology/computer science in both state and federal universities, computer/information technology specialists in the registered information technology industries and ICT trainers within south eastern, Nigeria.

Sample and sampling technique: The sample size for the study was 204, comprises of 88 lecturers of information technology/computer science in both State and Federal Universities, 63 information and communication technology specialists in the registered information technology industries and 53 ICT trainers. Purposive random sampling technique was used to select experienced 204 computer and information and communication technology specialists.

Instrument for data collection: A structured questionnaire was used as the instrument for data collection. Questionnaire items were developed in line with each of the research questions. The questionnaire was divided into two parts, part A contained items seeking for information on personal data of each respondent while part B contained sections A-G. Part B of the questionnaire contained a five Likert response scale of Strongly Agree (SA), Agree (A), Undecided (UN), Disagree (D) and Strongly Disagree (SD) with corresponding numerical values of 1-5, respectively.

Validation of the instrument: The copies of questionnaire were face validated by five experts from the three federal universities and one state university offering computer science or information and communication technology programmes. The suggestions of the experts especially corrections of ambiguous and non-technical statements and the inclusion of relevant missing items were utilized to develop the final version of the questionnaire.

Reliability of the instrument: Internal consistency of the questionnaire items was determined using Cronbach alpha reliability method. Copies of the instrument were administered to thirty lecturers and computer/information technology specialists outside the study area, preferably South-South geopolitical zone. Cronbach alpha reliability method was used to calculate their responses in order to determine the internal consistency of the questionnaire items. The reliability coefficient of the entire questionnaire items was 0.89 which indicated that the instrument items are reliable

Method of data collection: The copies of the questionnaire were administered to respondents in their different locations with the help of 10 trained research assistants, two per state within the study area. A week later the copies of the administered questionnaire were collected back for data analysis. One hundred percent return rate is anticipated.

Method of data analysis: Factor analysis, mean and standard deviation were utilized to analyze the data obtained for the study. A cut-off point of 3.50 was used for decision making. Any item whose mean is 3.50 or

Table 1: Mean responses of lecturers, trainers and ICT specialists on the objectives of E-teaching capacity building programme

Objectives of E-teaching capacity building programme: On completion of this programme the trainees should be able to:	$\bar{X}$	SD	Prioritization (Ranking)	Remarks
State the meaning of E-teaching programme	4.32	0.72	3	Agree
Identify relevant facilities for E-teaching	3.52	0.84	14	Agree
State various benefits of E-teaching over E-learning	4.21	0.70	5	Agree
State various steps in using visual E-teaching facilities	3.90	0.69	8	Agree
Apply different e-teaching facilities effectively	3.74	0.80	11	Agree
Prepare lesson by using relevant E-teaching facilities	4.38	0.70	1	Agree
Implement lesson or training by using E-teaching approach	3.93	0.77	7	Agree
Implement the prepared lesson by applying E-teaching facilities	4.37	0.71	2	Agree
Use E-teaching facilities and tools for evaluating instruction in various courses	3.81	0.81	10	Agree
State steps in using E-teaching facilities to develop test for assessing the objectives of training programme	3.72	0.73	12	Agree
Upload prepared lessons onto the internet	4.38	0.72	1	Agree
Apply interactive board for teaching courses to students in colleges of education	3.69	0.68	13	Agree
Make use of start board and magic board for teaching courses in a class	3.86	0.83	9	Agree
Prepare good power point presentation using laptops	4.29	0.74	4	Agree
Configure E-teaching facilities to yield maximum teaching and learning	4.18	0.81	6	Agree

X = Mean of Respondents; SD = Standard Deviation; A = Agree; N = Number of the respondents

above was judged as agree or required while any item whose mean is <3.50 was judged as disagree or not required. For selecting suitable contents for the development of the e-teaching capacity building programme, 0.50 as factor loading was utilized. Any item with the factor loading of 0.50 and above was regarded as required and any item with factor loading <0.50 was regarded as not required.

The analysis of variance was used to test the null hypothesis at 0.05 level of significance. The null hypothesis of no significant difference was accepted for any item whose p>0.05 but it was rejected for any item whose p<0.05. All computations was done using the Statistical Package for Social Sciences (SPSS) version 17.0.

The data presented in Table 1 reveal 15 objectives of E-teaching capacity building programme. The Means for the objectives ranged from 3.69-4.38 and each mean is above the cutoff of 3.50 indicating that all could be the objectives of E-teaching capacity building programme for lecturers of Nigerian universities. The standard deviation values for the fifteen objectives ranged from 0.69-0.84 and were <1.96, that is 95% confidence limit. This showed that the respondents were not far from one another in their responses and that their responses were not far from the mean. This added some value to the reliability of the mean.

The data presented in Table 2 reveal that 59 items had their factor loadings ranged from 0.51-0.96 and were above the factor loading of 0.50 at 10% over lapping variance with three components. This indicated that 59 items were required for the development of E-teaching capacity building programme for lecturers of Nigerian universities. One item with factor loading below 0.50 was discarded from the contents of the E-teaching capacity building programme. This was in agreement with Giachino and Gallington that if content has no components of non loading items, it is assumed that the factorial validity of the content is high.

Data presented in Table 3 on research question three shows that all the 21 training facilities had mean values ranging from 3.50-3.96 which are greater than the cut-off point value of 3.50 indicating that all the facilities could be utilized for implementing E-teaching capacity building programme. The standard deviation values for the 21 training facilities ranged between 0.64-0.82 and were <1.96, 95% confidence limit which implied that the responses of the respondents are close to one another and to the mean.

The data presented in Table 4 no research question four reveal 60 instructional strategies which their mean values ranged from 3.50-4.13. Each of their means is above the cutoff of 3.50 indicating that all instructional strategies could be used for implementing the E-teaching capacity building programme. The standard deviation values for the 60 instructional strategies ranged from 0.74-1.06 and were <1.96, that is 95% confidence limit. This showed that the respondents were not far from one another in their responses and that their responses were not far from the mean. This added some value to the reliability of the mean.

The data presented in Table 5 reveal 22 evaluation techniques in which their Means ranged from 3.61-4.16. Each of the means is above the cutoff of 3.50 indicating that all could be employed to assess the objectives of E-teaching capacity building programme. The standard deviation values for the 22 evaluation techniques ranged from 0.72-0.88 and were <1.96, that is 95% confidence limit. This showed that the respondents were not far from one another in their responses and that their responses were not far from the mean. This added some value to the reliability of the mean.

Data presented in Table 6 on research question seven show that all the 12 motivational strategies had mean values ranging from 3.50-4.06 which are greater than the cut-off point value of 3.50 indicating that all the motivational strategies are required by trainers for

Table 2: Factor loading of the responses of lecturers, specialists and ICT trainers on the contents of E-teaching capacity building programme

Contents of e-teaching capacity building programme	Factor loading at 0.50	Remarks
Operation of E-teaching facilities		
Connect computer to the accessories with cables appropriately	0.69	Required
Connect computer and accessories to power supply	0.79	Required
Boot on the computer and switch on the accessories	0.86	Required
Open various programmes from the start menu	0.85	Required
Create a document from the Microsoft office	0.65	Required
Stroke the keys and the space bar with finger tips to type alphabet	0.66	Required
Create a file or folder	0.78	Required
Save the text in file or folder	0.81	Required
Format CD plate or flash drive	0.73	
Save and transfer text from the folder to the storage facility	0.76	Required
Close the file or folder after use	0.76	Required
Short down computer after use.	0.78	Required
Switch of all the accessories	0.72	
Disengage computer and accessories from power supply	0.84	Required
Uploading of text onto internet		
Connect all necessary cables to computer including source of power supply	0.80	
Boot the computer correctly	0.85	Required
Decide on how the material will be organized (e.g., title, subject matter, logical, numerical)	0.69	Required
Create a temporary file/folder by opening window explorer	0.69	Required
File the text pages in a folder appropriately	0.82	Required
Connect computer to internet service provider	0.88	
Design web page for entering and formatting text, images, table and other features	0.85	Required
Search for a good navigation system (search engine) that users can easily get from place to place	0.75	Required
Create a document from the Microsoft office	0.75	Required
Log on a programme on the internet to File Transfer Protocol (FTP) address and login permission	0.74	Required
Send transfer/text from folder to on line location using identified search engine	0.76	Required
Down load the text to ensure accurate/effective uploading	0.76	Required
Edit and change configuration of local site if need be	0.78	Required
Disconnect from search engine on the internet	0.80	
Video conferencing		Required
Choose a soft ware programme for the video conferencing such as Logitech Quick Cam Camera software, Microsoft or Microsoft instant messenger friends finders	0.86	Required
Install video conferencing programme appropriately	0.77	Required
Connect computer to internet/on line	0.77	Required
Locate the installed programme	0.76	Required
Start the instant messenger (installed video conferencing programme)	0.83	Required
Search for friends online to connect for testing	0.62	Required
Schedule time table for video conferencing with students/learners	0.56	
Start video conferencing at the appropriate time as scheduled	0.81	Required
Close programmes at the end of the conference	0.60	Required
Disconnect from the internet service provider after teaching.	0.69	Required
Planning and implementing lesson using E-teaching facilities		Required
Create a cell phone or mobile device policy for classroom	0.91	Required
Prepare lesson plan using ipad, laptops and cell phones	0.90	Required
Use modern mobile phones to access technology web based contents	0.70	Required
Create media rich deliverable for the teachers and students as well as global audience	0.69	
Apply Ipods or other mobiles to store and retrieve technical information	0.86	Required
Use mobile phones to provide instructional materials to students	0.72	Required
Download various kinds of materials through mobiles	0.65	Required
Apply cell phone to access online public access catalogue and share knowledge	0.54	Required
Employ mobiles facilities for sharing educational information resources through Infrared, Bluetooth and WiFi	0.65	Required
Share with students' movies, audio files and other learning materials relating to technical courses through their mobile phones	0.67	Required
Teach the prepared lesson using mobiles	0.66	Required
Used cell phone for recording and playing multimedia educational contents	0.73	Required
Apply cell phones with cameras for documenting visual materials and collecting scientific data	0.71	Required
Use Twiddeo to upload video made on mobile phone to twitter for the purpose of learning	0.77	Required
Photo blogging using telephones for effective teaching and learning of courses	0.51	Required
Make slides hows for mobile phones	0.74	
Apply various types of information and communication technologies for teaching courses	0.84	Required
Set up projector to deliver power point	0.85	Required
Upload prepared lesson on to the internet	0.84	Required
Shut down the systems used for instructional delivery correctly	0.83	Required
Close the E-teaching platform after training	0.96	Required
Arrange the hardware parts of the E-teaching correctly	0.34	Not required

Table 3: Mean responses of lecturers, ICT trainers and specialists on the training facilities for implementing E-teaching capacity building programme

Training facilities	$\bar{X}$	S.D	Remarks
Magic board plus temporary makers	3.74	0.76	Required
Starboards for displaying instruction	3.54	0.72	Required
Projectors with white screen	3.83	0.79	Required
Laptops with relevant features	3.71	0.69	Required
Technical textbooks on E-teaching	3.93	0.78	Required
Lecture hall for the training programme	3.51	0.66	Required
Public address system	3.79	0.75	Required
Table and chairs	3.91	0.69	Required
Writing pads and pens	3.61	0.70	Required
Hard disks	3.80	0.67	Required
Internet service	3.53	0.74	Required
Assorted smart phones	3.50	0.73	Required
Posters on E-teaching facilities	3.96	0.73	Required
Instructional manuals on E-teaching	3.73	0.64	Required
Ipad technologies	3.91	0.76	Required
Relevant handout	3.74	0.74	Required
Electric power system	3.81	0.68	Required
Hand bills and tracts on E-teaching	3.62	0.82	Required
Flat screen televisions	3.61	0.76	Required
Personal digital assistance	3.72	0.75	Required
Well equipped ICT laboratory	3.95	0.71	Required

X = Mean of respondents; SD = Standard Deviation; A = Agree; N = Number of the respondents

Table 4: Mean responses of lecturers, ICT trainers and IT specialists on the instructional strategies for implementing the E-teaching capacity building programme

Instructional strategies	$\bar{X}$	S.D	Remarks
Using of power point and projector for training academic staff on e-teaching	3.70	0.84	Agree
Learning by doing strategy	3.67	0.88	Agree
Using compact disc and cassettes in presentation	3.83	0.77	Agree
Audio visual materials/object	3.62	0.85	Agree
Using Films and videos in delivering lectures	3.91	0.81	Agree
Workshops on e-teaching programme	4.10	0.79	Agree
Group dynamic	3.84	0.76	Agree
Dualised training	3.50	0.79	Agree
Using internet as a means of instruction delivery	3.82	0.74	Agree
Interactive lecture	3.63	0.80	Agree
Using practice teaching	3.62	0.80	Agree
Prepare and deliver skills to be taught in slides	3.51	0.84	Agree
Deliver lectures inform of film show to trainees	3.81	0.75	Agree
Simulation	3.84	0.79	Agree
Using tape recorders in instructing skills to trainees	4.13	0.77	Agree
Using as many as possible flow charts when instructing trainees on e-teaching	3.52	0.84	Agree
Using different types of film shows for instruction delivery	3.62	0.84	Agree
Using well configured ICT systems for instruction	3.62	0.83	Agree
Using scraps of different types of computers and other e-teaching facilities for training	3.52	0.84	Agree
Small hands-on group training	3.93	0.80	Agree
Large group training	3.51	0.87	Agree
Conversation with questions posed to elicit thoughtful responses from learners	4.20	0.79	Agree
Verbal instructions during capacity building	4.28	0.80	Agree
Make use of photo sequences	3.78	0.82	Agree
Using diagrams of well setup ICT network for training	3.50	0.82	Agree
Film viewing	3.76	0.79	Agree
Dual training	3.74	0.76	Agree
Group dynamic	3.71	1.02	Agree
Distance learning	3.83	0.76	Agree
Self paced learning	3.61	0.84	Agree
Action plan preparation and presentations	3.81	0.96	Agree
Symposium	3.83	0.84	Agree
Individual and small group work and presentations	4.04	1.06	Agree
Experience sharing	3.52	0.99	Agree
Story analysis	3.62	0.80	Agree
Brainstorming	3.60	0.80	Agree
Seminar	3.68	0.85	Agree
Group Exercises	3.76	0.75	Agree
Webinar	3.91	0.86	Agree
Cooperative learning	3.50	0.96	Agree
Debate	3.72	0.87	Agree

Table 4: Continue

Instructional strategies	$\bar{X}$	S.D	Remarks
Teaching methodologies			
Lesson method	3.56	0.81	Agree
Discussion method	3.64	0.77	Agree
Panel discussion	3.73	0.74	Agree
Role-play method	3.53	0.74	Agree
Lecture method	3.60	0.74	Agree
Demonstration method	3.71	0.80	Agree
Reciprocal peer tutoring	3.64	0.79	Agree
Project method	3.62	0.88	Agree
Cognitive apprenticeship instructional method	3.72	0.74	Agree
Explanatory method	3.99	0.84	Agree
Questioning method	3.61	0.82	Agree
Learning mode	3.71	0.75	Agree
Meta-learning	3.92	0.80	Agree
Guided discovery method	3.82	0.79	Agree
Field trip method	3.93	0.79	Agree
Use exhibition as method of teaching during implementation of e-teaching	3.60	0.79	Agree
Apply virtue laboratory strategy for teaching academic staff of colleges of education	3.99	0.91	Agree
Programmed instructional method	3.53	0.80	Agree
Apply authentic learning mode for teaching some contents in courses	3.93	0.92	Agree

X = Mean of respondents; SD = Standard Deviation; A = Agree; N = Number of the respondents

Table 5: Mean responses of lecturers, ICT trainers and IT specialists on the evaluation techniques required for assessing the E-teaching capacity building programme

Evaluation techniques	$\bar{X}$	S.D	Remarks
Evaluation techniques			
Observation technique	3.84	0.82	Required
Written questions and answers	3.74	0.79	Required
Oral techniques	3.61	0.74	Required
Students Practical technique	3.71	0.84	Required
Project technique	3.83	0.72	Required
Procedure testing	3.90	0.80	Required
Check list	3.83	0.81	Required
Rating scale	4.14	0.86	Required
Evaluation questionnaire	3.69	0.75	Required
Matching tests	3.85	0.83	Required
Multiple choice tests	4.10	0.83	Required
Short answer tests	3.83	0.84	Required
Performance tests	4.08	0.83	Required
Psycho productive tests	4.16	0.82	Required
Evaluation activities			Required
Identify various E-teaching facilities for instruction	3.84	0.81	Required
State benefits of E-teaching	3.74	0.80	Required
Configure E-teaching facilities without causing any havoc	3.94	0.88	Required
Use E-teaching facilities provided to reach students at various locations	3.80	0.78	Required
Prepare lesson in power point format	3.74	0.80	Required
Make use of starboard during teaching	3.81	0.86	Required
Set up projector and screen for presentation	3.71	0.84	Required
State how to maintain some of the E-teaching facilities	3.84	0.82	Required

X = Mean of respondents; SD = Standard Deviation; A = Agree; N = Number of the respondents

Table 6: Mean responses of lecturers, trainers and IT specialists on the motivational strategies required by trainers for enhancing their performance in training of lecturers of Nigerian Universities

Motivational strategies	$\bar{X}$	S.D	Remarks
Select qualified and competent personal as academic staff trainers in E-teaching	3.81	0.86	Required
Pay commensurate salaries and allowance to the trainers when due	3.78	0.74	Required
Provide instructional facilities to the trainers for effective training of the academic staff in e-teaching	3.50	0.84	Required
Access the level of competency of the trainers through the academic staff for appropriate reinforcement or re-training	3.86	0.76	Required
Give feed back to the trainers on their performance for encouragement and improvement after assessment	4.06	0.86	Required
Provide loans for welfare of the trainers who may require it at affordable interest rate	3.73	0.77	Required
Provide accommodation and health services to the trainers and their spouses at training	3.93	0.87	Required
Promote trainers regularly based on satisfactory criteria	3.71	0.84	Required
Address the challenges encountered by the trainers during training of youth and provide solution	3.84	0.90	Required
Guarantee the freedom and security of the trainers at the training centers	4.02	0.90	Required
Provide free meals to trainers	3.72	0.85	Required
Give outstanding trainers praises, awards and gifts	3.65	0.91	Required

X = Mean of respondents; SD = Standard Deviation; A = Agree; N = Number of the respondents

Table 7: Mean scores of lecturers trained with E-teaching capacity building programme and those lecturers trained without E-teaching capacity building programme

Groups	N	Pre-test $\bar{X}$	Post-test $\bar{X}$	Mean gain
Experimental	56	9.82	35.05	25.23
Control	54	9.29	19.33	10.04

enhancing their performance in training of lecturers of Nigerian universities. The standard deviation values for the 12 strategies ranged between 0.74-0.99 and were <1.96, 95% confidence limit which implied that the responses of the respondents are close to one another and to the mean.

The data presented in Table 7 shows that lecturers trained with E-teaching capacity building programme had a mean score of 9.82 in the pre-test and a mean performance score of 31.05 in the post-test making a pre-test, post-test mean gain in experimental group to be 21.23. The lecturers trained without E-teaching capacity building programme had a mean performance score of 9.29 in the pre-test and a post-test mean performance score of 19.33 with a pre-test, post-test mean gain of 10.04. With this result, the lecturers trained with E-teaching capacity building programme performed better in the performance test than those trained without E-teaching capacity building programme. This also implies that E-teaching capacity building programme developed is effective in training academic staff/lecturers of universities[35-40].

RESULTS AND DISCUSSION

The findings of this study revealed 15 objectives for the development of E-teaching capacity building programme. The findings were in agreement with the opinion of Sheen that behavioural/performance objectives are the best for the study carried out to equip individuals with skills, knowledge and attitudes. In addition, Mager[5] reported that performance objectives are very precise statement of what a teacher expect the student to do and should consist of three elements, namely, statement of observable behavior or performance on the part of learner; descriptions of the condition under which learner behavior is to occur and prescription of a minimally acceptable level of performance or criteria on the part of learner. Objectives of a programme serve as guide for the implementation of a training programme. It directs teachers and learners on what to learn, the types of skills, knowledge to acquire most especially when it stated using action words. Orlich *et al.*[6] explained that action words such as do, solve, repair, service, develop, dismantle among others are used in setting behavioural/performance objectives for capacity building programme.

The study found out that 59 out of 60 contents were required for development of E-teaching capacity building programme for lecturers of Nigerian universities. This finding agreed with Giachino and Gallington that if content has no components of non loading items, it is assumed that the factorial validity of the content is high. The finding also agreed with the opinion of Jone[7] that the higher the absence of low loading items the more important and suitable the content. The finding was in agreement with the opinion of Kapoma and Namusokwe that content is a list of subjects, skills, topics, themes, concepts or works to be covered in a programme.

It was found out that 20 facilities were required for implementing E-teaching programme. The finding was in consonance with the findings of Yavala that facilities help in teaching skills and competence to individuals. For a training programme to be interesting, suitable training facilities must be selected for the training. Training facilities help the learners to acquire relevant skills needed on the job most especially when they are allowed to use during their practical class. Also the findings of the study agreed with the finding of Bates *et al.*[8] that flashing software, internet facilities, cell phones, computer with Windows 2000 or newer with a USB Port are good for training in individuals[4, 45].

The finding of the study revealed 59 strategies for implementing E-teaching capacity building programme. The findings were in agreement with the finding of Onah[2] who carried out a study on development of a digital empowerment programme for students on E-learning in the universities in southeast of Nigeria and found out that demonstration, cooperative learning, discussion and guided discovery are suitable as instructional methodologies for teaching competence to students. Teaching methods serve as medium in which teachers transfer planned instruction to learners. Also, the finding was consonance with the findings of Ogbuanya, etc., that teaching approaches such as reciprocal peer tutoring improve someone's competence in electrical/electronic subjects when effectively applied during instruction. It was found out by the study that 22 evaluation techniques and activities were required for assessing national diploma students on cell phone maintenance training modules. The finding was in agreement with the opinion of Osinem that oral questions and procedure testing could be used to evaluate training outcome. The author stated that remarked that each of the techniques possesses distinct characteristics that make it especially useful for measurement of a particular kind of performance. The finding also agreed with the opinion of Okoro that check list, rating scale and evaluation questionnaire are performance evaluation techniques used to assess performance of individuals[46-50].

CONCLUSION

It was recommended that the developed E-teaching capacity building programme should be employed to train lecturers in Nigerian universities[51-55]. The study also recommended that training facilities identified should be used for implementing the E-teaching capacity building programme. Government should implement the motivational strategies identified by the study for effective training of lecturers of Nigerian universities.

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