

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SKILLS NEEDED OF COMPUTER EDUCATION LECTURER FOR EFFECTIVE TEACHING OF DATABASE FOR SUSTAINABLE DEVELOPMENT IN SOUTH EAST UNIVERSITIES, NIGERIA.

BY

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Abstract

This study is on the ICT skills needed of Computer Education Lecturer for effective teaching of database for Sustainable Development. The purpose of the study was to find out the Digital skills Computer Education Lecturer need for effective teaching of database for sustainable development in Southeast Universities. A survey research design was adopted for the study. A total population of 86 respondents comprising of thirty six (36) male lectures and fifty (50) female lecturers were used for the study. The entire population was studied. A 4-point scale structured questionnaire was used for data gathering. The reliability coefficient of the instrument was 0.75 using Cronbach Alpha Coefficient method while three lecturers carried out face validation on the instrument. Three research questions and three null hypotheses tested at 0.05 level of significance guided the study. Mean statistic was employed to answer the research questions, while t-test statistic was used to test the hypotheses. It was found out that ICT skills Computer Education Lecturer need are the basic ICT skill, file management skills and web/programming skills for effective teaching of database for sustainable development in Southeast Universities. Again, the null hypotheses (H_{01} , H_{02} and H_{03}) of no significant difference between the mean scores of male and female respondents on the basic ICT skills, file management skills and web/programming skills Computer Education lecturers need for effective teaching of database in Federal Universities were all accepted. The recommendations made among others were that Computer Education lecturers should put in more efforts towards acquiring adequate digital skills to enhance effective teaching and learning in the institutions, Government should show more commitment to the development of an ICT based education in the country by making available ICT grants to our universities and staff on annual basis and that the universities should also meet the computer training needs of the staff through sponsorship for workshops, seminars, conferences, orientations; and attendance should be made compulsory for all the staff.

Key words: ICT, Computer Education, Lecturer, Skills, Database, Teaching and sustainable development

Introduction

University plays a vital role in the development of a nation; it provides the intellectual force and manpower needed to sustain the socio-economic and political aspiration of the nation.

University is a unique place of training of high level man-power in every conceivable field of human endeavour. According to Wikipedia, the free online encyclopedia (2016), university is an institution of higher education and research,

which grants academic degrees in a variety of subjects. It is also regarded as a corporation that provides both undergraduate education and postgraduate education. Similarly, Adekigbe (2005) opined that university is a place of enlightenment, a place for exploring the frontiers, and an institution in which people through the process of socialization, are inspired with the ability, not just to discern things but also to apply theories to explain events, values, the knowledge of the natural order for the pursuits of the common good, and the individual well-being. In the University, the roles of lecturers are geared towards achieving the University's goals as embedded in the National Policy on Education (2004) which include: Teaching, Research, Dissemination of existing and new Information, pursuit of services to the university community and a store of knowledge. To accomplish these responsibilities efficiently and effectively, it requires the use of computer. These therefore calls for a variety of ICT skills which are useful and in most cases required as essential part of teaching and learning.

The fact remains that, the ICT holds the promise of increased productivity. However, this promise is not achieved due to the limited abilities of the people that make use of the technology. In fact, effective use of these digital technologies in teaching and learning depends on individuals' computer literacy and it has been widely recognized as a vital skill. ICT has been generally adopted by all levels of education in the country today, as a delivery system of imparting knowledge into students. All branches of education have accepted this emergent technology as a veritable tool for effective teaching. Due to its importance, the Federal government of Nigeria instructed in the National Policy on Education (2004) to set standards, regulate framework for the deployment of ICT infrastructure at all levels of education in Nigeria. The federal government

urged the state government to adopt the National Policy on Computer Education of 2004 which has its objectives as to encourage teachers to develop a sense of rapport with computer and appreciate its potentials for solving teaching and learning challenges and to entrench computer culture that permeates all activities in institutions of learning (Adeosun, 2010).

Information and Communication Technology (ICT) is defined as computer based tools used by people to work with the information and communication processing needs of an organization. It encompasses the computer hardware and software, the network and several other devices (video, audio, photography camera, etc.) that convert information (text), images, sound, motion etc. into common digital form (Milken Exchange on Education Technology, 1999). ICT "refers to technologies people use to share, distribute, gather information and to communicate through computers and computer networks" (ESCAP, 2000). According to Rouse (2005) ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICT is the ability to use electronic means to capture, process and store and communicate information. Jens (2009) explained that ICT includes e-mail, telecommunications and the Internet, and involves the use of computers, telephones, fax machines and copiers, and a variety of mobile communication devices. The term also refers to electronic documents and other content, as well as video communication, software and external drives. In the context of this study, ICTs are digital devices used to create, design, store, share, transmit, interpret and manipulate

information in its various formats such as database among others.

A database is a data structure that stores organized information. It is also the collection of schemas, tables, queries, reports, views, and other objects. The data are typically organized to model aspects of reality in a way that supports processes requiring information. Most databases contain multiple tables, which may each include several different fields. For example, a company database may include tables for products, employees, and financial records. Each of these tables would have different fields that are relevant to the information stored in the table. In order to carry out this in the companies or institutions, it requires a specific skill.

Furthermore, Okorie (2001) defined skill as the expertness, practical ability, dexterity and tact possessed by an individual. Obi (2005) stated that a person is said to have acquired a skill when he can finish a given piece of work at a given time with minimum errors. Osinem (2008) opined that skill is an individual's capacity to control elements of behaviour, thinking and feeling within specified contexts and within particular task domains. The author explained that skills can be referred to as those series of learned activities/acts required simultaneous or sequential coordinated pattern of mental and /or physical activity in relation to an object or other display of information, usually involving both teaching and learning process.

Teaching involves transfer of knowledge from an individual to another. Atsumbe, Raymond, Umar and Ajunwa (2015) stated that teaching is a process of impacting or providing knowledge or skills that implies an educational activities involving transfer of knowledge from one individual to others. VanDam in Ayoo and Lubega (2010), learning occurs to a large extent

through education and training. It was stated that training is change in skills and education as a change in knowledge. Learning is the process of acquiring new skills and knowledge with the goal of improving performance for sustainable development.

Sustainable development is the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depends. For sustainable development to be achieved, it is crucial to harmonise three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected and are all crucial for the well-being of individuals and societies

With the present ways of teaching database in universities in South East Nigeria in particular, it is most likely that the teaching is faulty hence, the continuous poor performance of students in database. Recognizing the importance of effective teaching in academic performance of students in schools, this study is investigated to fine out the ICT skills needed of Computer Education Lecturer for effective teaching of database for Sustainable Development in Southeast Universities.

Statement of the problem

It is widely acknowledged that ICT can be used to improve the quality of teaching and learning in any tertiary institution. In fact, ICTs are becoming natural part of man's daily life; thus, their use in education by staff and students is becoming a necessity. ICTs are essential tools in any educational system. They have the potentials of being used to meet the learning needs of individual students, promote equality of educational opportunities; offer high quality learning materials, increase self-efficacy and independence of learning among students, and

improve teachers' professional development in database. Database is one of the key courses in the universities that offer different opportunities to students after graduation if properly impacted. Preliminary investigation conducted by the researches shows that most lecturers do not have the ICT skills needed for teaching database. Certainly, the present and future academic global community will utilize ICTs to a high degree. This has made it imperative that lecturers and students not only need to use ICTs, but they need to become comfortable with using them in teaching and learning of database. It is against this backdrop that this study is undertaken to find the ICT skills needed of Computer Education Lecturer for effective teaching of database for Sustainable Development in Southeast Universities.

Purpose of the study

The main purpose of the study is to find out the ICT skills needed of Computer Education Lecturer for effective teaching of database for Sustainable Development in Southeast Universities. Specifically the study sought to:-

1. Determine the basic knowledge of Computer skill lecturers needed for effective teaching of database in Federal Universities.
2. Determine Proficiency in using file management skills lecturers needed for effective teaching of database in Federal Universities.
3. Determine web/programming skills lecturers needed for effective teaching of database in Federal Universities.

Research Questions

Three research questions guided the study. They are:-

1. What is the basic knowledge of Computer skills lecturers needed for effective teaching of database in Federal Universities?
2. What is the Proficiency in using file management skills lecturers needed for

effective teaching of database in Federal Universities?

3. What are the web/programming skills lecturers needed for effective teaching of database in Federal Universities?

Research Hypothesis

Three null hypotheses were formulated and tested at 0.05 level of significance. They are:-

1. There is no significant difference between the mean scores of male and female lecturer on the basic knowledge of Computer skill lecturers needed for effective teaching of database in Federal Universities.
2. There is no significant difference between the mean scores of male and female lecturer on Proficiency in using file management skills lecturers needed for effective teaching of database in Federal Universities.
3. There is no significant difference between the mean scores of male and female lecturer on web/programming skills lecturers needed for effective teaching of database in Federal Universities.

Methodology

The study adopted a descriptive survey research design. The study was carried out in South East Nigeria. The study covered five federal universities in South East which include Federal University, Ndufu-Alike, Abakaliki Federal University of Technology, Owerri, Nnamdi Azikiwe University, Awka, Michael Okpara University of Agriculture, Umudike and University of Nigeria, Nsukka. The area was chosen based on the fact that each of the university has Computer as a programme and the lecturers teach database as full or part of the course and also they have similar problem in using ICT in database classes.

The population for this study was 86 respondents comprising of thirty six (36) male lectures and fifty (50) female lecturers. The entire population was studied. The instrument for data collection was a 4-point scale structured questionnaire. The instrument was subjected to face validation by three lecturers

from the Department of Computer Education, University of Nigeria, Nsukka. Each lecturer was served with a copy of the instrument and was requested to read through each item for the purpose of identifying ambiguous statement and offer suggestions for improving the instrument. The instrument was also subjected to reliability test, using Cronbach alpha method to determine the internal consistency which yielded a coefficient of 0.75. The questionnaire was administered by the researchers with the aid of three research assistants.

Data collected for the study were analyzed using the mean to answer the three research

questions. Based on the four point rating scale of the questionnaire, a mean of 2.5 was adopted as the acceptance or agreement level for the items. Consequently, any mean below 2.5 was taken as rejection. The structured questionnaire items 1-15 had a 4-point rating scale of highly needed (HN), moderately needed (MN), slightly needed (SN) and not needed (NN) representing 4,3,2 and 1 respectively. Similarly, t-test was used to test the null hypotheses at 0.05 level of significance using Statistical Packages for Social Sciences (SPSS) software.

Presentation of the Results

Table 1: Mean rating and T-test analysis of responses on the basic knowledge of Computer skills lecturers needed for effective teaching of database in Federal Universities

S/N	Item Descriptions	Male Respondents N ₁ =36		Female Respondents N ₂ = 50		\bar{x}_G	SD _G	Rmk for RQ ₁	t-cal	Sig 2 tailed	Rmk for HO ₁
		\bar{x}_1	SD ₁	\bar{x}_2	SD ₂						
1.	Understand basic computer hardware components and terminology	3.22	0.77	3.83	0.58	3.53	0.68	Accepted	1.13	0.13	NS
2.	Understand the concepts and basic functions of a common computer operating system	2.98	0.75	2.90	0.80	2.94	0.78	Accepted	-0.58	0.57	NS
3.	Start up, log on, and shut down a computer system properly	3.40	0.66	3.00	0.73	3.20	0.67	Accepted	-0.87	0.39	NS
4.	Use note taking tools to share interesting content with your students	3.45	0.70	2.95	0.81	3.20	0.75	Accepted	1.08	0.10	NS
5.	Use of screen casting tools to create and share tutorials	3.15	0.68	3.11	0.77	3.13	0.73	Accepted	1.20	0.23	NS
6.	Use of collaborative tools for text construction and editing	3.54	0.67	3.00	0.73	3.27	0.70	Accepted	-0.28	0.78	NS
7.	Use polling software to create a real-time survey in class	2.94	0.80	3.40	0.66	3.17	0.73	Accepted	1.49	0.14	NS
8.	Use Social bookmarking to share resources with and between learners	3.21	0.72	2.95	0.81	3.08	0.78	Accepted	-0.81	0.42	NS
9.	Exploit computer games for pedagogical purposes	3.22	0.80	3.45	0.70	3.34	0.75	Accepted	-0.25	0.80	NS
10.	Use digital assessment tools to create quizzes	3.13	0.72	3.22	0.77	3.18	0.75	Accepted	0.85	0.40	NS

RO= Research Question. HO₁ = Null Hypothesis 1. NS = Not significant. T-tab = 1.99

The data presented in table 1 revealed the analysis on the basic ICT skills Computer

Education lecturers need for effective teaching of database in Federal Universities was made.

The data showed that all the items have the grand mean rating between 2.94 and 3.54 which were above the cutoff point 2.50, were accepted. The respondents accepted that the basic ICT skills represented by all the items are needed by the Computer Education lecturers for effective teaching of database in Federal Universities

This was further confirmed by the test of hypothesis, presented on the same table. The t-test analysis revealed that there is no significant difference between the opinion of the male and

female respondents on the 10 items isolated for the study. The items recorded t-calculated values less than tabulated value of 1.99 at 0.05 levels of significance and 84 degree of freedom on the respective items. It implied that there was no significant difference between the mean scores of male and female respondents on the basic ICT skills Computer Education lecturers need for effective teaching of database in Federal Universities. The null hypothesis (H_{01}) for each independent sample in each item was therefore, accepted.

Table 2: Mean rating and T-test analysis of responses on the file management skills Computer Education lecturers need for effective teaching of database in Federal Universities

S/ N	Item Descriptions	Lecturers N ₁ =36		Students N ₂ = 50		\bar{x}_G	SD _G	Rmk for RQ ₁	t-cal	Sig 2 taile d	Rmk for HO ₁
		\bar{x}_1	SD ₁	\bar{x}_2	SD ₂						
1.	Create database, tables, queries, reports and forms	3.27	0.76	3.32	0.71	3.30	0.74	Accepted	0.82	0.41	NS
2.	use of Structured Query Language (SQL) for database manipulation	3.44	0.70	3.30	0.85	3.37	0.78	Accepted	-2.52	0.13	NS
3.	use of data and object modeling,	3.09	0.83	3.20	0.68	3.15	0.76	Accepted	-1.62	0.11	NS
4.	Upload database forms and tables to the web	3.15	0.77	3.23	0.68	3.19	0.73	Accepted	-1.72	0.09	NS
5.	create multiple table systems with screens, updates and report	3.05	0.81	3.19	0.76	3.12	0.79	Accepted	-0.56	0.58	NS
6.	Designing, previewing/ printing of database files	3.23	0.80	3.40	0.61	3.32	0.71	Accepted	0.15	0.88	NS
7.	Data entry using existing templates and other technique	3.06	0.79	3.52	0.76	3.29	0.78	Accepted	-1.50	0.14	NS
8.	Merging of data e.g. with word processing	3.18	0.83	3.22	0.74	3.20	0.79	Accepted	-2.15	0.33	NS
9.	Update and expand existing database	3.37	0.60	3.10	0.73	3.34	0.67	Accepted	-1.99	0.48	NS
10.	Security and privacy awareness	2.95	0.74	3.41	0.61	3.18	0.68	Accepted	-0.19	0.85	NS

RQ= Research Question, HO₁ = Null Hypothesis 1, NS = Not significant, T- tab = 1.99

In table 2, responses on file management skills Computer Education lecturers need for effective teaching of database in Federal Universities were analyzed. The data show that all the 10 isolated items have the mean rating between 2.95 and 3.52 which were above the cutoff point 2.50 and were accepted. Further to

this, all the grand means ratings were between 3.12 and 3.37 showing that Computer Education lecturers need file management skills for effective teaching of database in Federal Universities.

Further to this, the testing of hypothesis of no significant difference between the mean scores of male and female respondents on the file management skills Computer Education lecturers need for effective teaching of database in Federal Universities on the same table was analyzed and tested. The result revealed that all t-calculated was all less than t- tabulated value of 1.99 at 0.05 levels of significance and 84

degree of freedom on the respective items. This indicated that there was no significant difference between the mean scores of male and female respondents on the file management skills Computer Education lecturers need for effective teaching of database in Federal Universities. The null hypothesis (H₀₂) for each independent sample in each item was therefore, accepted.

Table 3 Mean responses on the web/programming skills Computer Education lecturers need for effective teaching of database in Federal Universities

S/N	Item Descriptions	Male Respondents N ₁ =36		Female Respondents N ₂ = 50		\bar{x}_G	SD _G	Rmk for RQ ₁	t-cal	Sig 2 taile d	Rmk for HO ₁
		\bar{x}_1	SD ₁	\bar{x}_2	SD ₂						
1.	Backing up in the Cloud	3.46	0.53	3.43	0.68	3.45	0.61	Accepted	-0.72	0.48	NS
2.	Programming with Visual Basic	3.26	0.65	2.98	0.81	3.12	0.73	Accepted	0.04	0.97	NS
3.	Installation of application programs	3.34	0.72	3.32	0.68	3.33	0.70	Accepted	-1.79	0.08	NS
4.	Find and evaluate authentic web based content	2.88	0.76	3.45	0.58	3.17	0.67	Accepted	0.74	0.46	NS
5.	Use code libraries, which are collections of independent lines of code, to simplify the writing of Program	2.99	0.77	3.15	0.63	3.07	0.70	Accepted	-0.55	0.59	NS
6.	Create and test code in an integrated development environment (IDE)	3.06	0.79	3.32	0.65	3.19	0.71	Accepted	-0.29	0.77	NS
7.	Use of online sticky notes to capture interesting ideas	3.52	0.71	3.27	0.76	3.40	0.74	Accepted	0.66	0.51	NS
8.	Use Social networking sites to connect with students for instructional delivery	3.18	0.73	3.21	0.60	3.20	0.67	Accepted	0.66	0.51	NS
9.	Curate web content for classroom learning	3.22	0.80	3.18	0.83	3.20	0.82	Accepted	-1.19	0.23	NS
10.	Using blogs and wikis to create online platforms for students	3.37	0.59	3.07	0.71	3.22	0.65	Accepted	-0.08	0.93	NS

RQ= Research Question, HO₁ = Null Hypothesis 1, NS = Not significant, T- tab= 1.99

From table 3, responses on web/programming skills Computer Education lecturers need for effective teaching of database in Federal Universities were analyzed. It was revealed that the respondents accepted that Computer Education lecturers need web/programming skills for effective teaching of database in

Federal Universities since all mean rating and grand means were above 2.50 cutoff point. In all, the hypothesis of no significant difference between the mean scores of male and female respondents on the web/programming skills Computer Education lecturers need for effective teaching of database in Federal

Universities was presented on the same table. It revealed that all the t-calculated values are all less than the t-tabulated value of 1.99 at 0.05 levels of significance and 84 degree of freedom on the respective items. This shows that there was no significant difference between the mean scores of male and female respondents on the web/programming skills Computer Education lecturers need for effective teaching of database in Federal Universities. The null hypothesis (H_{03}) for each independent sample in each item was therefore, accepted.

Major Findings

In view of the data analyzed and hypotheses tested, the following findings were recorded.

1. Computer Education lecturers need skills in Microsoft office and provide students with task management tools to organize their work and plan their learning, use infographics to visually stimulate students, use note taking tools to share interesting content with your students, use of screen casting tools to create and share tutorials, use of collaborative tools for text construction and editing, use polling software to create a real-time survey in class and among others for effective teaching of database in Federal Universities in Nigeria .
2. Computer Education lecturers need file management skill in Creating database, tables, queries, reports and forms, use of Structured Query Language (SQL) for database manipulation, Upload database forms and tables to the web, designing, previewing/ printing of database files, update and expand existing database etc for effective teaching of database for sustainable development.
3. Computer Education lecturers need web/programming skills in backing up in the Cloud, programming with Visual Basic, installation of application programs, finding and evaluating authentic web based content, creating and test coding in an integrated

development environment (IDE), using social networking sites to connect with students for instructional delivery etc for effective teaching of database for sustainable development in Federal Universities in Nigeria.

4. Null hypotheses (H_{01} , H_{02} and H_{03}) of no significant difference between the mean scores of male and female respondents on the basic ICT skills, file management skills and web/programming skills Computer Education lecturers need for effective teaching of database for sustainable development in Federal Universities were all accepted.

Conclusion

The objective of this study was to determine the Digital skills Computer Education Lecturer need for effective teaching of database for sustainable development in Southeast Universities. As well stated, no nation can rise above its level of education. To buttress this, the Federal Republic of Nigeria (FRN, 2004) said that no education system may arise above the quality of its teachers and so teacher education shall continue to be given major emphasis in all educational planning and development. The study used three research questions and three research hypotheses as search lights for the Digital skills Computer Education Lecturer need for effective teaching of database for sustainable development. Appropriate statistical tools were used for data analysis and hypothesis testing. Thereafter, conclusions were drawn from the results. Owing to the conclusions and findings, relevant recommendations were made for the study.

Recommendations

Based on the findings of this study, the following recommendations are made. They are:-

1. Computer Education lecturers should put in more efforts towards acquiring

adequate ICT skills to enhance effective teaching and learning the institutions.

2. Government should show more commitment to the development of an ICT based education in the country by making available ICT grants to our universities and staff on annual basis.
3. Universities should also meet the computer training needs of the staff through sponsorship of workshops, seminars, conferences, orientations; and attendance should be made compulsory for all the staff.
4. Government should support and provide more stable power supply and university authorities to supplement this power supply by providing stand-by generating sets to all departments in the universities

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