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ICT competences and capacity building needs of technical and vocational education lecturers in Nigerian universities

Abstract

The prevalence in the use of ICT to carry out several functions in the developed world, especially in the academic field calls for upgrading of TVE lecturers in Nigeria in the use of ICT in order to perform their job effectively since TVE programmes are crucial and far reaching for technological advancement. This is in addition to the fact that the TVE lecturers' responsibilities are complex. This study therefore identified the ICT competencies that TVE lecturers in Nigeria need for capacity building. In order to carry out this study, three research questions were raised and answered using mean and mean differences. The study employed the descriptive survey research design. All the TVE lecturers in the universities in the five states of the south-southern geopolitical zone of Nigeria formed the population of the study. The sample size of the study was 90 TVE lecturers selected from six universities in the five states of the south-southern geopolitical zone of Nigeria. A questionnaire of two-scale components for possessed and needed ICT competencies constructed and validated by experts was used for data collection. The reliability coefficients of the questionnaire were 0.83 and 0.76 respectively for the two scale components. The data analyses revealed that TVE lecturers need capacity building in the use of ICT for instructional, research and administrative purposes. It was recommended that state and federal governments should develop and implement functional provision of packages for the training and retraining of TVE academic staff members in the use of ICT for effective and efficient job performance...

Introduction

University education is the level of education where emphasis is highly placed on specialization since it may be regarded as the terminal point of formal education, and the point of professional transition from school to work. According to Federal Republic of Nigeria (FRN, 2004), as documented in the national policy on education (NPE), university education shall make optimum contribution to national development by intensifying and diversifying programmes for the development of high level manpower within the context of the need of the nation. This implies that the university education should provide the necessary skills through teaching to learners to enable them become the manpower force of the nation's cultural, economic and technology growth.

Another goal of university education as stipulated in the NPE document is that university research shall be relevant to the nation's development goals; and that universities shall be encouraged to disseminate their research results to both government and industries. These emphases show that university research can serve as a strong source, and means through which government and industries

can accelerate the nation's development. These goals are achievable through university education due to the varieties programmes in different areas of study or disciplines. One of such programme is Technical and Vocational Education (TVE).

TVE is a skill-oriented programme. It is meant to prepare learners with the relevant and functional skills necessary for the world of work (Ogwo & Oranu, 2006; Okoro, 2006; Bassualdo & Toby, 2004). One important and unavoidable means of transferring these skills at the university level is through the instructor, the TVE lecturer. The TVE lecturer is usually faced with the responsibility of teaching the relevant knowledge, skills and attitudes as well as undertaking researches for both personal and national growths, in addition to performing other administrative functions.

The instructional role of the TVE lecturer is usually carried out in the lecture halls, workshops/laboratories and through any other means by teaching, assessing and evaluating the learners (Olaitan, Nwachukwu, Igbo, Onyemachi & Ekong, 1999). Another important responsibility of the TVE lecturer is conducting researches. It is one of the means through which the lecturer grows professionally and contributes significantly to national development. The university lecturer also performs some administrative functions (Obeki, 2012). The administrative responsibility of the TVE lecturer may be by virtue of primary responsibility, appointment or election. Some of the administrative functions include supervising and counseling the students, engaging in students' admission and registration exercises and heading or directing a unit, department, faculty, institute or school.

These roles of the university lecturer are obviously complex and time consuming; hence it can be asserted the TVE lecturer performs a complex job. This is apparently why Barnett (2000) stated that academics now operate in a world of super-complexity where the very frameworks of their professions are continuously in a state of flux. The forgoing implies that the general university education is a complex one, and its changing context has presented lecturers with the challenges of meeting its complex and technological demands. In order to withstand or overcome the challenges, TVE lecturers need to be equipped with functional technological skills and knowledge to carry out their duties effectively.

One of the ways by which the complex nature of the jobs of academics may be effectively tackled is the application, adoption and use of information and communication technology (ICT). This is the general term representing all the technologies, hardware, software and telecommunication devices, through which information is captured, gathered, stored, manipulated, processed, presented and retrieved (Konni, 2002; UNESCO, 2003; Oladunje, 2010). According to Chienien (2003) and Asiabaka (2010), ICT is technology-based, knowledge-based and is indispensable in the present age. This fact makes ICT beneficial to every aspects of human endeavor. The benefits of ICT in education and in TVE in particular are numerous. These include its application in business, science, research, engineering, office automation, accounting, medicine and education (Oladipupo & Ilaboya, 2006; Sansanwal, 2009).

ICT tools are numerous and can be used for different purposes. ICT tools that are used for instructional purposes (teaching-learning process) include internet, closed circuit TV, simulation, DVD and CD ROM, interactive television, videoconferencing, caspoc, proteus and e-workshop (Stevens, 2001; Hampton, 2002; Chinien, 2003; Chiemeka, 2011; Agbeoeze, Ugwoke & Onu, 2012; Chukwuedo & Omofonmwan, 2013). Conducting researches in educational institutions is becoming easier apparently because of ICT. The ICT tools necessary for conducting research by academics include statistical package for social sciences (SPSS), anti-plagiarism software and internet (Chinien, 2003; Morgan, Leech, Gloeckner & Barrett, 2004; Onugha, 2009). The large number of students seeking university admission and already admitted may not be easily managed without the integration and application of ICT in the administration of university education in Nigeria. Some of the ICT tools

used for administrative purposes in the university are video-conferencing, internet and peripherals (Selwood, 2004; Okonkwo & Ogwo, 2010).

The general use of ICT in education has been conceived differently as the means to achieve the stated goals of institutions. D'Andrea and Gosling (2005) cited in Markus and Lynn (2009) affirmed that the expansion of the application of technology in teaching and learning in particular has been one of the most ubiquitous major changes in higher education. The authors explained that on the one hand the use of ICT is presented as a solution to many of the teaching and learning challenges brought about by the new higher education landscape; while on the other hand, the process of lecturers' application of ICT in their teaching and their students applying it in their learning often represent an almost insurmountable obstacle for both partners.

Challenges in the implementation of ICT in the university education in Nigeria are visible. The challenges in the teaching-learning process, conducting researches and performing administrative functions using ICT in the university can be addressed in different ways. In the opinions of Salmon (2005) and Conole, White and Oliver (2007) some of the ways in which higher education institutions have responded to the implementation of ICTs in teaching and learning include developing institutional strategies to change, focusing on the impact of learning technologies and offering of models for representing and understanding organisational contexts and change management. Another strategy yet employed by higher education institutions in response to ICT challenges is focusing on support for staff development issues and placing greater emphasis on professionalism of academic staff as teachers and assessors (Conole, White & Oliver, 2007; Markus & Lynn, 2009). In recent times, Nigeria universities education has adopted the use of ICT applications in carrying duties such as administrative jobs, research, teaching and learning. The situation in Nigerian universities is lack or inadequate ICT training and retraining of lecturers. Apparently majority of Nigerian university lecturers undergo personal training in the use of ICT applications, and this may not be good enough because of the cost and time of such training. Hence in efficiency in the use of ICT application by the lecturers may arise, which will in turn lead ineffective performance of duties. The need therefore for capacity building in the use of ICT applications for job performance.

Based on the foregoing, TVE lecturers in Nigerian universities need to be equipped with the relevant technologies in order to withstand the adoption, application and use of ICT applications to discharge their duties effectively. Since technology changes frequently, TVE academic staff needs constant in-service training, especially in ICT for capacity building. Capacity building according to AuSAID (2004) in Ifeanyieze and Osinem (2011) is the process of developing competencies and capabilities in individuals, groups, organisation sectors or countries which lead to sustained and self-generating performance improvement. The fundamental goal of capacity building is therefore to enhance the ability of individuals based on perceived needs. Nwobu (2009), cited in Asogwa and Ohagwu (2010), defined capacity building as the effort geared towards improving the level of knowledge, skills and attitude possessed by an individual for proficiency in a given task or job. Therefore for effective and efficient use of ICT by TVE lecturers, and in order to improve their job performance, there is need to determine the critical and important areas of ICT applications where capacity building is required by the lecturers. This is the problem of this study as the TVE lecturer needs ICT competency to carry out the numerous duties effectively in the classrooms, offices and workshops.

Conceptual Framework of the Study

The job performance of TVE academic staff can be measured by the extent of achievement in instruction (teaching), research and administration. These variables make up the standard and level of professionalism and growth of an academic staff in the university. The interaction of these variables for determining the lecturers' job performance is schematically shown in fig. 1.

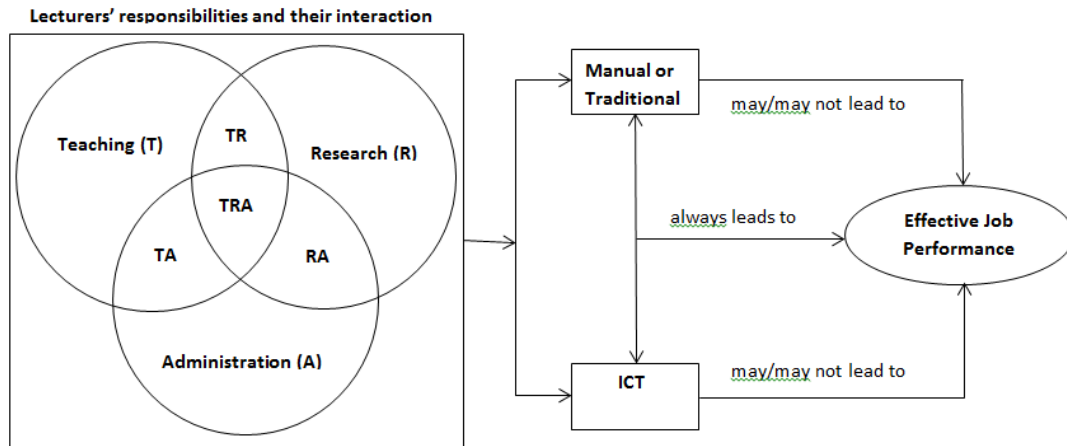


Fig. 1: Lecturers' Responsibilities-Performance Model (Igbinedion & Chukwuedo, 2013)

The schema shows the interaction of the teaching (instruction), research and administrative roles of academic staff. These roles can be achieved traditionally (manually), technologically (ICT) or combined. The traditional method alone may or may not help in achieving effective job performance, the application of ICT can, to some extent help in achieving effective job performance while the application of both the traditional and ICT methods will always bring about effective job performance.

Purpose of the Study

The main purpose of the study was to identify ICT competences that TVE lecturers in Universities in South-southern Nigeria need improvement in order to perform their work tasks effectively. Specifically the study identified the ICT competences capacity building needs of TVE lecturers for instructional, research and administrative purposes.

Research Questions

The following research questions were raised and answered in this study

- What are the ICT competencies capacity building needs of TVE lecturers for instructional purposes?
- What are the ICT competencies capacity building needs of TVE lecturers for research purposes?
- What are the ICT competences capacity building needs of TVE lecturers for administrative purposes?

Methodology

The descriptive survey research design was employed in this study in order to collect data from selected TVE lecturers in universities in South-southern Nigeria and therefore make generalization of the findings to other TVE lecturers in Nigeria. The population of the study was all the TVE lecturers in South-southern Nigeria. Out of these a sample of 80 TVE lecturers, which was made up of 40 each from federal and state universities respectively, was selected using stratified and convenience random sampling techniques. The lecturers were stratified into federal and state universities' lecturers, hence stratified random sampling technique. The convenient sampling technique was employed in selecting any available TVE lecturer in the universities without any criterion, as a result of strike action in Nigerian public universities within the period of July to December, 2013 when the data was collected.

Questionnaire was the instrument used for data collection. It had items with two categories of response scales of possessed and needed. The possessed category scale had four point response scales of highly possessed (HP), averagely possessed (AP), slightly possessed (SP) and not possessed (NP) with corresponding values of 4, 3, 2 and 1 respectively, and was meant to determine the extent of the ICT

competences possessed by the lecturers. The needed category scale had four point response scales of highly needed (HN), averagely needed (AN), slightly needed (SN) and not needed (NN) with corresponding values of 4, 3, 2 and 1 respectively, and was also meant to determine the extent the lecturers need the ICT competences.

The questionnaire was validated by three experts, and its reliability coefficients obtained through Cronbach alpha formula were 0.83 and 0.79 for the possessed and needed scale categories respectively. The data collected were analyzed using weighted mean. The weighted mean with Improvement Need Index (INI), which represents the performance gap, was used to answer the research questions and take decision on the items where TVE lecturers need capacity building in the use of ICT. In taking the decision, the following steps were followed:

1. Weighted mean value of each of the item of extent of ICT competences possessed was calculated (X_P), and the weighted mean value of each of the item of extent of ICT competences needed was calculated (X_N)
2. The ICT competencies Performance Gap analysis X_{PG} which is the difference between X_N and X_P , was determined by ($X_{PG}=X_N-X_P$) for decision making on capacity building as thus:
 - a. Where the X_{PG} is positive (+), it means that capacity building is needed (CBN) and the level of competency needed is greater than the level possessed.
 - b. Where the X_{PG} is negative (-), it means that capacity building is not needed (CBNN) and the level of competency needed is lower than the level possessed.
 - c. Where the X_{PG} is zero (0), it means that capacity building may or may not be needed because in practice it may still be necessary for capacity building; and at this point the level of competency possessed is equal to the level possessed.

Results

The results of this study were obtained from the analysis of the data for the research questions. The results are presented in tables as follows:

Research Question 1: What are the ICT competencies capacity building needs of TVE lecturers for instructional purposes?

Table 1: ICT competencies Performance Gap Analysis of Mean Rating of the Responses of TVE Lecturers for Instructional Purpose

s/n	ICT Competences for Instructional Purpose	X_N	X_P	$X_{GP}=X_N-X_P$	Remark
1	Ability to use power point presentation	3.86	2.28	1.58	CBN
2	Ability to deliver lecture through the internet	3.57	2.08	1.49	“
3	Ability to use interactive whiteboard/starboard for lectures	3.64	2.21	1.43	“
4	Ability to use Skype for distance lectures	3.31	1.86	1.45	“
5	Ability to use closed circuit TV (CCTV) for practical class	3.60	2.00	1.60	“
6	Ability to adopt video conferencing for lectures	3.46	1.96	1.50	“
7	Ability to apply simulation in teaching practical class	3.60	2.01	1.59	“
8	Ability to prepare/deliver lecture with CD/DVD ROM	3.40	2.72	0.68	“
9	Ability to prepare/deliver lecture through the television	3.69	2.24	1.45	“
10	Ability to prepare/deliver lecture through the radio	3.48	2.02	1.46	“
11	Ability to prepare/deliver lecture through YOU-TUBE	3.42	1.83	1.59	“
12	Ability to use social networks e.g. facebook, LinkedIn, etc.	3.16	2.37	0.79	“
13	Ability to adopt audio conferencing for lectures	3.34	2.26	1.08	“
14	Ability to use AUTOCARD/other related pictorial software	3.51	1.76	1.75	“
15	Ability to use assistive technologies for the handicaps	3.33	1.59	1.74	“
16	Ability to use LISTERV to deliver lecture note to students	3.20	1.68	1.52	“
17	Ability to use Microsoft office to produce lecture materials	3.28	2.67	0.61	“

Source: Field Study, 2013. CBN means Capacity Building Needed.

The data presented in Table 1 shows that the mean responses of the competences possessed by the TVE lecturers in the use of ICT for job performance ranged from 1.59 to 2.72, while the mean responses of ICT competences needed by the lecturers ranged from 3.16 to 3.86. The mean values of ICT competencies performance gap ranged from 0.61 to 1.75. Since all the values of the ICT competencies performance gap analysis are positive, it means that the TVE lecturers need capacity building in all the identified ICT competences for instructional purpose, however the extent to which capacity building is needed reduces as the values of the ICT competencies performance gap analysis decreases or approaches zero.

Research Question 2: What are the ICT competencies capacity building needs of TVE lecturers for research purposes?

Table 2: ICT competencies Performance Gap Analysis of Mean Rating of the Responses of TVE Lecturers for Research Purpose

s/n	ICT Competences for Research Purpose	X_N	X_P	$X_{GP} = X_N - X_P$	Remark
18	Ability to use the internet to source for information	3.38	3.13	0.25	CBN
19	Ability to use the anti-plagiarism software	3.44	2.04	1.40	“
20	Ability to use Microsoft Excel for data analysis	3.71	2.26	1.45	“
21	Ability to format tables using special software packages	3.54	2.20	1.34	“
22	Ability to employ reference style using software packages	3.56	2.38	1.18	“
23	Ability to perform data analysis with SPSS, GENSTAT, etc	3.51	2.04	1.47	“
24	Ability to edit research paper using software packages	3.58	2.27	1.31	“
25	Ability to design research models/schema using software	3.44	2.14	1.30	“
26	Ability to present research papers using power points slides	3.42	2.62	0.80	“
27	Ability to upload research papers on the internet	3.52	2.56	0.96	“

Source: Field Study, 2013. CBN means Capacity Building Needed.

Table 2 reveals that the mean responses of the ICT competences possessed by the TVE lecturers for job performance ranged from 2.04 to 3.13, while the mean responses of ICT competences needed by the lecturers ranged from 3.38 to 3.71. The values of the ICT competencies performance gap analysis ranged from 0.25 to 1.47. This simply means that the TVE lecturers need capacity building in all the identified ICT competences for research purpose, since all the values of the ICT competencies performance gap analysis are positive. It can however be deduced that the extent to which capacity building is needed reduces as the values of the ICT competencies performance gap analysis also decreases.

Research Question 3: What are the ICT competencies capacity building needs of TVE lecturers in ICT for administrative purposes?

Table 3: ICT competencies Performance Gap Analysis of Mean Rating of the Responses of TVE Lecturers for Administrative Purpose

s/n	ICT Competences for Administrative Purpose	X_N	X_P	$X_{GP} = X_N - X_P$	Remark
28	Ability to upload and validate students' result online	3.63	2.27	1.36	CBN
29	Ability to course advise students through the internet	3.56	2.33	1.23	“
30	Ability to use LISTERV to reach many students at once	3.56	1.79	1.77	“
31	Ability to prepare students results with Microsoft office	3.59	2.71	0.88	“
32	Ability to use hardware peripheral e.g. printer, scanner	3.20	2.87	0.33	“
33	Ability to use mobile phones to address official matters	3.39	3.07	0.32	“
34	Ability to use videoconferencing for issues e.g. meetings	3.40	2.19	1.21	“
35	Ability to perform students online admission/registration	3.71	2.41	1.30	“
36	Ability to use multimedia for administrative issues	3.49	1.66	1.83	“

Source: Field Study, 2013. CBN means Capacity Building Needed.

Data shown in Table 3 reveals that the mean responses of the competences possessed by the TVE lecturers in the use of ICT for job performance ranged from 1.66 to 3.07, while the mean responses of ICT competences needed by the lecturers ranged from 3.20 to 3.71. The values of the ICT competencies performance gap analysis ranged from 0.32 to 1.83. These values are positive, and this means that the TVE

lecturers need capacity building in all the identified ICT competences for administrative purpose, though the extent to which the lecturers need ICT capacity building for this purpose reduces as the values of the ICT competencies performance gap analysis decreases or approaches zero.

Discussions

The collected to answer research question 1 revealed that TVE lecturers in Nigerian universities need capacity building in the use of ICT for instructional purposes. The data summarized in Table 1 showed that eight ICT competences for instruction, having the values of the ICT competencies performance gap analysis ranging from 1.50 to 1.75, apparently are averagely needed by the TVE university lecturers for capacity building, while the values of performance gap for nine ICT competences ranging from 0.61 to 1.49 are perhaps slightly needed by the lecturers for capacity building. The findings are in agreement with that of Obi and Akarahu (2010) which revealed that business education teachers, male and female, required word processing skills, internet technology skills and telecommunication skills for effective teaching of marketing in colleges of education.

The data analyzed to answer research question 2 showed that the TVE lecturers need capacity building in the use of ICT for research purposes, however the ICT competency performance gap analysis of 0.25 for item 18 approaches zero and may be assumed that capacity building seems rarely needed by the lecturers in this competency. The values of the ICT competencies performance gap analysis for the rest of the nine items showed that the lecturers appear to slightly need capacity building in the use of ICT for research purposes.

The data generated to answer research question 3 revealed that the TVE lecturers need capacity building in the use of ICT for administrative purposes, but apparently ICT competencies capacity building are averagely needed for items 30 and 36, slightly needed for five items and rarely needed for items 32 and 33. The findings of this study may be likened to that of Okonkwo and Ogwo (2010) which revealed that there was the need to enhance school management through the use of ICT since ICT applications are poorly utilized in the management of school records.

Conclusion and Recommendations

ICT applications have become one of the technological tools upon which every human endeavor can perform certain duties effectively. For effective job performance to be attained by TVE lecturers in Nigerian universities, it was found that though the lecturers use ICT applications to perform their duties, there is need for capacity building of the lecturers in ICT competences in order to facilitate their duties with respect to teaching-learning process, conduction of research and administrative jobs. This means that if proper training is given to the lecturers on the use of ICT applications to perform their duties, efficiency may be attained. In line with the findings, it is recommended that state and federal governments should develop and implement functional provision of packages for the training and retraining of TVE academic staff in the use of ICT applications for effective and efficient job performance in Nigerian universities to keep them at par with their contemporary all over the world.

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Chukwuedo & Igbinedion

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