

Required Competencies and Possible Challenges of Information Communication Technology Assisted Teaching and Learning: Assessment of Nurse Educators and Structures in Calabar, Nigeria

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Abstract

Background: This study was conducted to assess required competencies and possible challenges of using ICTs in teaching by NEs in Calabar, Nigeria. Specific objectives were to investigate their knowledge of methods and self-reported skills in communicating educational instructions electronically, their views on the availability of required hardware and software as well as their acceptability of ICTs for use in teaching and learning.

Method: The study involved a cross-sectional descriptive design and proportionate random sampling technique to select 40% of NEs of all ranks in all the seven training institutions within the study area. This resulted in a sample size of 35 out of the target population of 88 NEs. The instrument was a 50-items self-administered structured questionnaire with content validity index of 0.88 and reliability coefficient of 0.83. Due attention was given to ethical considerations. Analyses of descriptive data involved frequency counts, percentages, means and standard deviations while the four generated hypotheses were tested using One-sample Population t-test for significance and One-way Analysis of Variance at significance level of 0.05.

Results: Results showed high level of knowledge by majority of the respondents in methods including internet-browsing 25 (71.4%); Microsoft word 23 (65.7%) Microsoft power point 22 (62.9%). Very few respondents had knowledge of methods used for teaching students such as Cam-studio 3 (8.6%) and Audacity 7 (20%). With the use of Cam-studio, electronic board and student-teacher software, 20 (57.1%) of the respondents rated their skills as poor or none-existing. Availability of required hardware showed a mean of 36 students to a computer. Similarly, 30 (85.7%) of the respondents need more time prior to emphasis on use of ICT assisted teaching. Furthermore NEs acceptance of use ICT in teaching was not significantly dependent on their years of working experience (Cal. $F=2.67>0.05$).

Conclusion and recommendations: NEs do not possess knowledge and skills that can enable ICTs assisted teaching for the students. Recommendations therefore included provision of structures, facilities, hardware and software that are needed for their training and re-training on all ICT methods for communicating educational instructions.

Keywords: Communication, information, knowledge, nurse-educators, skills.

I. INTRODUCTION

Information Communication Technology (ICTs) assisted teaching and learning in nursing education is the use of information technologies to support teaching and learning in the discipline of nursing. Borrowing from the definition of e-Health by Mastrian and McGongle [1], ICTs assisted teaching and learning may be seen as educational initiatives and practice supported by electronic or digital media. The focus is on the use of information and technology to enable, expand, enhance or support human activities in teaching and learning experiences. ICTs are used as tools and applications to support such teaching and learning activities. It is a means of keeping professional education relevant to societal changes and needs. According to literature [2], the challenge to nurse educators is the ability to ensure that professional education remains relevant and keeps abreast of both societal and healthcare changes. However, as important as this assertion is, the use of ICTs in nursing education is rather not impressive in many parts of the world including the study area.

ICT competencies for teaching and learning should involve using ICTs for teaching and learning with focus on: Mastering the work environment; Searching for information; Processing information; Presenting information; Communicating and collaborating on the internet; and evaluating teaching and learning projects [3].

Throughout the last two decades, ICTs has in theory become a significant part of policy debates in societies in general but with improved practical functioning only in the more developed nations of the world. In those developed nations, government and healthcare institutions have emphasized the tremendous value and importance of advancing the use of ICT throughout their activities. This is on the other hand slowly gaining grounds in the developing nations. Without question, ICT should become critical to the daily operations and strategic planning of learning experiences. Issues of quality nursing education which can be enhanced through ICTs

assisted education should become focal concern for well informed nurse educators. To this end also, the advancement of ICTs to support nursing education should be seen as an essential strategy to the sustainability and modernization of nursing education globally.

Efforts to initiate future graduates and nurses into the world of information and communication technologies have been provided by relatively few nurse educators [4]. It is also documented that nursing teachers often have limited knowledge on how to incorporate ICTs in the classroom [5]. The author also asserted that in the information age, teachers and their more technologically oriented students are increasingly being called upon to make use of software and the internet. It is subsequently essential to reflect upon this reality to make learning and skills' acquisition more enticing in an increasingly connected world.

The teacher who fails to adapt teaching and learning to the students' needs, requirements and preferences can soon find that many of the students consider books and classrooms to be the epitome of boredom. They had hitherto been accustomed to perpetual stimulation in their environments and to an intense lifestyle which they seek to reproduce in the classroom. Failure to find and use appropriate teaching strategies may result in boredom and dropping out [5].

For the aforementioned reasons, examination of nurse educators' ability to use ICTs is very essential in order to plan effective and standardized ICT assisted teaching and learning experiences that should take nursing education to greater heights. It is important to state that communicating educational instructions electronically or digitally can involve searching for information, generating, documenting, retrieval and communicating information during teaching and learning activities. Thus, nurse educators must be skilled in the various new teaching approaches including use of ICTs in enhancement of teaching and learning or obtaining and imparting knowledge in nursing education processes to influence needed changes. Furthermore, the needed structures and equipments including the required hardware required for use of ICTs in nursing education must be available as and when needed.

This study therefore focused on those necessities with the objectives to investigate nurse educators':

- i. Knowledge of methods (searching for information, generating, documenting, retrieval and communicating) of communicating educational instructions electronically;
- ii. Self-reported skills in communicating educational instructions electronically or digitally;

- iii. Views on the availability of required hardware and software for teaching and learning;
- iv. Acceptability of ICTs for use in nursing education.

Hypotheses: The four null hypotheses that guided the study were:

Ho1: Nurse Educators' mean scores of knowledge of methods of communicating educational instructions electronically will not be significantly different from the expected mean = 37.5;

Ho2: Nurse Educators' mean scores of self-reported skills in communicating educational instructions electronically will not be significantly different from the expected mean = 35.0;

Ho3: The availability ratio of required hardware per students' population will not be significantly different from the expected in each school.

Ho4: The level of acceptability of ICTs in nursing education will not be significantly different among nurse educators with different years of experience.

Literature review

While widespread computer literacy has become a societal norm, the development of information and knowledge literacy supported by ICT remains a challenge in nursing education institutions. Studies have shown that the integration of the relevant ICTs knowledge and skills into nursing curricula has been limited and that this limitation is likely related to the limited number of nursing faculties with requisite understanding and knowledge or competencies to acquire or provide knowledge and promote acquisition of skills through ICT learning processes [6].

Although many of the competencies can be viewed and discussed in the context of ICTs used in teaching and learning among nurse educators, there are a number of competencies that are explicitly deemed most relevant and these include knowledge of methods and skills in communicating educational instructions electronically. Some of the competencies required although not exhaustive should include those provided as suggestions for ICT profile for nursing students as presented in Table 1 [5].

Table 1: Areas of ICT competencies and skills Adapted from: Phaneuf, [5].

Knowledge and skills competencies	Focus	Practical applications
Typing	Mastering a variety of keyboard functions, tablets	Saving, deleting, copy-pasting, texting, highlighting, inserting punctuating marks, cancelling, etc
Word processing	Preparing documents in accordance with basic grammar and formatting rules; Creating tables, illustrations and statistical graphs	Managing files, typing assignments and note-taking; using an automatic corrector; Creating tables required for assignments and research purposes; inserting illustrations.
Using the internet	Performing relevant and targeted searches; uploading and downloading data online; Collaborative learning.	Gathering online information for courses and broadening the learning base.
Consulting leading information sites	Consulting on-line dictionaries, encyclopedias, departmental sites.	Correcting and improving write-up, gathering academic or health-related information.
Using peripherals	Working with DVDs, CD-Roms, Bluetooth-enabled devices, Printers, USB flash devices	Supplementing information with other documents or programmes.
Using a spreadsheet	Creating tables and statistical graphs.	Building the tables required for academic work, research reports and to assume a leadership role in educational team.
Preparing a power point presentation	Preparing a summary or illustration of a document.	Making a multi-media presentation in classroom or at work.
Using a software programme e.g. Cam-studio, Audacity; Wiki	Preparing information document, maintaining academic-oriented communications, developing knowledge of programme functions	Transmitting information or educating students with folders and posters; participating in a forum, cooperation on-line, stating opinions, follow-up on and consolidating learning, performing academic self-assessment, developing meta-cognition, preparing teaching plan, computing examination results summary and statistical analyses.
E-mailing	Maintaining academic-oriented communications.	Communicating with peers, carrying out on-line supervision, providing information, corrections and feed-back.
Using information technology skills to improve teaching and learning	Consolidating and updating skills	Using conclusive evidence, anatomic drawings and documents provided by reliable on-line sources
Operating electronic devices used in teaching and learning	Becoming familiar with monitors and other devices	Application in teaching and learning experiences
Acting responsibly	Respecting copyright regulations; Avoiding plagiarism; maintaining confidentiality where necessary.	Providing sources of information when using the work of others, taking cognizance of information that should or should not be shared on-line.

Furthermore, the necessity for all nursing faculties to have core ICT knowledge and skills have been documented by many authors [7; 8]. The authors identified that many ICT initiatives required competencies that could be evaluated as ranging from novice nurse educator to experts in several identified areas. Similarly, the requisite knowledge and skills that should also be expected of nurse educators include the ability to use information and communication technologies to enhance e-learning; interpret and organize data into information to affect nursing education; and combine information to contribute to the development of education and research in nursing [9].

Additionally, apart from the identified practitioners' competencies documented in literature, other factors may limit the use of ICTs in nursing education arena. For this

reason and to achieve successful utilization of ICTs to enhance teaching and learning in nursing schools, the challenges that can hinder desirable practices are required to be identified and eliminated where possible. Such challenges can include factors identified by Gugerty and Sensmeier with focus on nurses' attitudes toward computers, lack of basic computer skills and nursing informatics competencies [10]. Commenting also on the challenges associated with the use of ICTs to promote nursing education, factors such as scarcity of ICT infrastructures, hardware and equipments were identified [11]. These may implicate insufficient or most often complete lack of electric power supply, none-availability of internet facilities, inadequate numbers or complete lack of hardware and lack of access to websites to mention but few of the challenges.

These issues identified in literature are very essential factors to be examined as it relates to use of ICTs to

promote professional nursing education and if nurse educators are to be assisted to remain relevant and keep abreast of societal, educational and healthcare changes.

II. METHODS

Study design

This study was a cross-sectional descriptive study to investigate the required competencies and possible challenges of information communication technology assisted teaching and learning among nurse educators in Calabar, Nigeria.

Setting, sampling and sample

The subjects were nurses who teach in nursing education institutions irrespective of their educational and professional education. All the seven nursing education institutions in the study area were involved with the target population of eighty-eight nurse educators. The schools involved one tertiary institution, two schools of nursing, one school of midwifery, one college of health technology, one school of psychiatric nursing and one school of ear, nose and throat (ENT) nursing.

Sampling involved proportionate random sampling technique of selecting 40% of the target population from each of the training institutions, with a total sample size of 35 nurse educators (subjects) from the seven schools.

Instrument

The questionnaire was designed by the researchers based on the study objectives and in line with the relevant variables as identified through literature review. It consisted of fifty items divided into five sections. Section A was for socio-demographic characteristics of respondents with six (6) items, Section B with fifteen (15) structured items elicited data on knowledge of methods of generating, documenting, retrieval and communicating educational instructions; Section C had fourteen (14) structured items to provide data on respondents' self reported skills in generating, documenting, retrieval and communicating educational instructions; Section D had ten (10) structured items to provide data on respondents' acceptance on use of ICT for teaching and learning while section E with five (5) structured items was to elicit data on availability of structures and equipments for electronic teaching.

Apart from the items on socio-demographic variables of respondents, all other sections had their questions structured as applicable on five-point scales of: i) Poor/none; Fair; Good; Very good and Excellent; ii) Strongly agree; Agree; Disagree; Strongly disagree and Undecided; and iii) None; 1-3; 4 – 6; 7 – 9; 10 and above.

Three nurse educators who are well knowledgeable in use of ICTs in nursing education examined the face validity of the items and also rated the contents which were computed to give a content validity index (CVI) of .88. To ascertain the reliability of the items, a test-retest reliability method was used with ten (10) neutral nurse

educators who were not to be included in the main study. The test-retest was performed with two weeks interval between the first and second data collection. The two sets of data were coded and subjected to statistical analyses using Pearson Product Moment Correlation Coefficient Statistics. The correlation coefficient of .83 was obtained.

Ethical consideration

The study was approved by the Ethics Committee of the State Ministry of Health, Cross River State and approval by each of the training institutions. The aims and benefits of the study were verbally explained to all participants as well as the expectations during and after the study. Voluntary participation was emphasized and informed consent was obtained from them. To maintain confidentiality, names of participants were not expected to be written in any part of the questionnaire and the training institutions were not also identified except with the use of numbers 1 – 7, with specific identification only known to the two researchers.

Procedure for data collection

Following the sampling procedure and in each of the institutions, the self administered questionnaires were distributed through face-to-face interaction with the researchers and on the spot retrieval of completed questionnaire in their offices. This ensured 100% return rate and assurance that the items were completed by the correct individuals or subjects who were selected for the study. This was necessary to ascertain truthful assessment of their levels of knowledge and self-reported skills.

Data analyses

The collected data were organized in line with the study objectives, coded accordingly with scoring ranging from 1 – 5 points. Five (5) points each were allotted to responses that indicated high levels of knowledge, self-reported skills and availability of hardware or ICT materials while poor levels of knowledge, self-reported skills and none or insufficient availability of equipment attracted the lowest score of one point. The data were analyzed using the Statistical Package for Social Sciences (SPSS Version 18 Chicago, IL., USA). The descriptive data were analyzed using frequency counts and percentages while One-Sample Population t-test for significance was used to test for knowledge, self-reported skills and utility ratio of hardware. Furthermore, One-Way ANOVA was used to test the acceptability of ICTs for teaching and learning among nurse educators with different years of working experience. Statistical significance was set at $P=.05$.

III. RESULTS

The socio-demographic characteristics of the respondents are presented in Table 1.

From Table 1, it can be observed that out of the thirty-five respondents, 9 (25.7%) had either B.Sc. or B.N.Sc.,

12 (34.3%) had Post-graduate Diploma in Education (PGDE), 9 (25.7%) had M.Sc. and 5 (14.3%) had Ph.D. in nursing and other related disciplines. In terms of teaching experience, 23 (65.7%) had worked for 1 – 10 years, 6 (17.1%) for 11–20 years and 6 (17.1%) for 21 – 30 years. All the ranks of nurse educators were represented. Respondents' age range was 30 – 64 years with a mean age of 44.9 and a standard deviation of 11.9.

Knowledge of methods of communicating educational instructions electronically (generating, documenting, retrieval and communicating) is presented in Table 2.

Table 2 shows varied levels of knowledge with the various methods. When observed from the level of knowledge that covers good, very good and excellent, it can be observed that in order of arrangement from the highest, the presentation is from internet browsing 25 (71.4%); Microsoft word 23 (65.7%); Microsoft power point 22 (62.9%); computer-based test 21 (60.0%); keyboarding 19 (54.3%); basic operating system 18 (51.4%) with the least level of knowledge recorded for software-cam-studio 3 (8.6%); Audacity 7 (20.0%); and students' teacher software 9 (25.7%).

The results of their self-reported skills are as presented in Table 3.

From Table 3, the area where the respondents were sufficiently skilled, covering good, very good and excellent arranged in order from the highest to the lowest were: Internet browsing 28 (80.0%); Microsoft power point 24 (68.6%); Microsoft word 23 (65.7%); keyboarding 21 (60.0%); Microsoft excel 18 (51.4%) and use of projector 18 (51.4%); while in the order of least arrangement of skills, the results obtained were: Audacity 5 (14.3%); software- Cam studio 9 (25.7%); Microsoft access 9 (25.7%); use of electronic board 10 (28.6%) and use of student teacher software 10 (28.6%). With each of the following variables: Cam studio, use of electronic board and student-teacher software, 20 (57.1%) of the respondents respectively rated their skills as poor or none existence.

Results on availability of required hardware for teaching and learning is presented in Table 4.

Table 4 shows that 30 (85.7%) of the respondents have no I-pad; 27 (77.1%) have no Table PC and 26 (74.3%) have no webcam. The only relatively available hardware centrally located in the schools were Desktops with numbers 1 – 3 recorded by 7 (20.1%) of the respondents; 4 – 6 by 5 (14.3%) of the respondents; 7 – 9 by 9 (25.7%) of the respondents; and numbers 10 and above also by 9 (25.7%) of the respondents. However, 5 (14.3%) of the respondents reported having no Desktop in their school. For Laptops, 10 (28.6%) had none; 12 (34.3%) had 1 – 3; 4 (11.4%) had 4 – 6; 5 (14.3%) had 7 – 9 while 4 (11.4%) had ten and above. Concerning Webcam, 26 (74.3%) of the respondents indicated having none; 3 (8.6%) had 1 – 3; 2 (5.7%) had 4 – 6; 3 (8.6%) reported having 7 – 9 while only one respondent representing 2.9% identified availability of within 10 and above.

The results on nurse educators' acceptability of ICTs for teaching and learning is presented in Table From Table 5, when viewed from the grouped responses related to acceptability (Strongly agree and Agree), results show that 33 (94.3%) of the respondents accepted that it was possible to integrate nursing knowledge with computer and information technology in teaching nursing students. Only 5 (14.3%) preferred the old traditional methods of teaching without ICTs. Their level of agreement was high for transiting to ICTs 32 (91.4%) and that each nurse educator should own and operate a computer proficiently 33 (94.3%). Up to 25 (71.4%) of the respondents stated that they are not using computer hardware in teaching and learning but intended to do so in future. Their level of disagreement was high on the fact that they may not be able to become ICTs specialists 32 (91.4%). Respondents who need more time before inclusion and emphasis for inclusion of ICTs in nursing education were 30 (85.7%). Up to 26 (74.3%) respondents disagreed to the statement that inclusion of ICTs in nursing education is impossible with the electricity supply situation in Nigeria. A total of 21 (60.0%) respondents disagreed to the statement that using computer hardware in teaching will destroy the quality of nursing education.

Results obtained from statistical analyses of the hypotheses are presented in Tables 6 and 7.

Three out of the four (4) hypotheses formulated to guide the study were tested using One-sample Population t-test. These hypotheses included:

Ho1: Nurse Educators' mean scores of knowledge of methods of communicating educational instructions electronically will not be significantly different from the expected mean = 37.5;

Ho2: Nurse Educators' mean scores of self-reported skills in communicating educational instructions electronically will not be significantly different from the expected mean = 35.0;

Ho3: The availability ratio of required hardware per students' population will not be significantly different from the expected in each school.

The results related to the three hypotheses are presented in Table 6.

From Table 6, the mean level of their computer-related knowledge (33.4) with a standard deviation of 10.71 and standard error of 1.81 is significantly lower than the expected level (37.5), when knowledge was cumulated as a continuous random variable (the P-value, 0.031 associated with the computed t-value, 2.249 is less than 0.05). The level of their self-reported skills taken as a continuous random variable (31.4) with a standard deviation of 12.51 and standard error of 2.11 was less than the expected level (35.0) but not significant since the P-value (0.095) associated with the computed t-value (-1.72) is greater than the chosen level of significance (0.05).

In terms of availability or utility ratio, a mean of 36 students to a computer was obtained, as against the maximum of 20 students to a computer in a week recommended by the Nigerian Universities Commission (NUC). This ratio (observed) is quite significantly lower than the recommended ratio of 20:1 per week (P-value, 0.023, associated with the computed t-value, 2.38, is less than 0.05).

Table 7 is a summary of the result from hypothesis four.

Ho4: The level of acceptability of ICTs in nursing education will not be significantly different among nurse educators with different years of experience.

To test this hypothesis, One-way analysis of variance was used with years of experience as factor and level of

acceptance of ICTs in nursing education as dependent variable.

From Table 7, the acceptance level varies with years of working experience with those who have worked for 21 – 30 years having the highest mean acceptance level (45.50), followed by those with 1 – 10 years experience (38.44) while the least were those with 11 – 20 years of working experience. These differences in mean level of acceptance in use of ICTs in teaching and learning were however not significant since the computed F-value (2.67) is greater than the chosen level of significance (0.05). It was therefore concluded that the level of acceptance of ICTs in nursing education does not depend significantly on the respondents' years of working experience.

Table 2: Socio-demographic characteristics of respondents (n=35)

Demographic variables	Frequency	Percentage
Age in years: 30 – 40	3	8.6
41 - 50	19	54.3
51 - 60	11	31.4
61 - 64	2	5.7
TOTAL	35	100
Educational/Prof. qualification:		
B.Sc./B.N.Sc.	9	25.7
Post-graduate Diploma in Education.	12	34.3
M.Sc.	9	25.7
Ph.D.	5	14.3
TOTAL	35	100
Years of Teaching Experience:		
1 – 10	23	65.7
11 - 20	6	17.1
21 - 30	6	17.1
TOTAL	35	100
Professional Ranks:		
Midwife educator	3	8.6
Public health nurse educator	5	14.3
Nurse educator	6	17.1
Clinical instructor	5	14.3
Assistant chief nurse educator	4	11.4
Chief nurse educator	5	14.3
Chief clinical instructor	2	5.7
Senior lecturer	3	8.6
Assistant director of nursing education.	1	2.9
Deputy director of nursing education.	1	2.9
TOTAL	35	100

Table 3: Nurse Educators' Knowledge of Methods of Communicating Educational Instructions Electronically (n=35)

Item contents	Poor/None	Fair	Good	V. Good	Excellent
Microsoft word	4 (11.4%)	8 (22.9%)	8 (22.9%)	13 (37.1%)	2 (5.7%)
Microsoft power point	6 (17.1%)	7 (20.0%)	13 (37.1%)	7 (20.0%)	2 (5.7%)
Microsoft Excel	8 (22.9%)	12 (34.3%)	8 (22.9%)	5 (14.3%)	2 (5.7%)
Microsoft access	17 (48.6%)	10 (28.6%)	6 (17.1%)	1 (2.9%)	1 (2.9%)
Basic operating system	4 (11.4%)	13 (37.1%)	10 (28.6%)	7 (20.0%)	1 (2.9%)
File directories	10 (28.6%)	10 (28.6%)	11 (31.4%)	2 (5.7%)	2 (5.7%)
Keyboarding	1 (2.9%)	15 (42.9%)	11 (31.4%)	6 (17.1%)	2 (5.7%)
Internet browsing	6 (17.1%)	4 (11.4%)	10 (28.6%)	12 (34.3%)	3 (8.6%)
Software – Cam studio	22 (62.9%)	10 (28.6%)	2 (5.7%)	1 (2.9%)	-
Audacity	23 (65.7%)	5 (14.3%)	5 (14.3%)	2 (5.7%)	-
Projector	9 (25.7%)	11 (31.4%)	10 (28.6%)	4 (11.4%)	1 (2.9%)
Electronic board	18 (51.4%)	7 (20.0%)	8 (22.9%)	1 (2.9%)	1 (2.9%)

Student-teacher software	21 (60.0%)	5 (14.3%)	4 (11.4%)	5 (14.3%)	-
Learning portal	15 (42.9%)	3 (8.6%)	9 (25.7%)	8 (22.9%)	-
Computer-based test	14 (40.0%)	12 (34.3%)	6 (17.1%)	3 (8.6%)	-

Table 4: Nurse Educators' self-reported skills in communicating educational instructions electronically (n=35)

Item contents	Poor/None	Fair	Good	V. Good	Excellent
Microsoft word	5 (14.3%)	7 (20.0%)	10 (28.6%)	10 (28.6%)	3 (8.6%)
Microsoft power point	4 (11.4%)	7 (20.0%)	14 (40.0%)	7 (20.0%)	3 (8.6%)
Microsoft Excel	5 (14.3%)	12 (34.3%)	10 (28.6%)	5 (14.3%)	3 (8.6%)
Microsoft access	12 (34.3%)	14 (40.0%)	3 (8.6%)	3 (8.6%)	3 (8.6%)
Basic operating system	10 (28.6%)	8 (22.9%)	14 (40.0%)	2 (5.7%)	1 (2.9%)
File directories	9 (25.7%)	12 (34.3%)	10 (28.6%)	3 (8.6%)	1 (2.9%)
Keyboarding	5 (14.3%)	9 (25.7%)	11 (31.4%)	7 (20.0%)	3 (8.6%)
Internet browsing	3 (8.6%)	4 (11.4%)	11 (31.4%)	13 (37.1%)	4 (11.4%)
Software – Cam studio	20 (57.1%)	6 (17.1%)	5 (14.3%)	4 (11.4%)	-
Audacity	24 (68.6%)	6 (17.1%)	4 (11.4%)	1 (2.9%)	-
Projector	5 (14.3%)	12 (34.3%)	11 (31.4%)	6 (17.1%)	1 (2.9%)
Electronic board	20 (57.1%)	5 (14.3%)	6 (17.1%)	3 (8.6%)	1 (2.9%)
Student-teacher software	20 (57.1%)	5 (14.3%)	5 (14.3%)	4 (11.4%)	1 (2.9%)
Learning portal	17 (48.6%)	5 (14.3%)	7 (20.0%)	6 (17.1%)	-

Table 5: Nurse Educators' Acceptance of use of ICT in Teaching and Learning (n=35)

Item contents	SA	Agree	Disagree	S. Disagree	Undecided
It is possible to integrate nursing knowledge with computer and ICT in teaching and learning.	23 (65.7%)	10 (28.6%)	-	2 (5.7%)	-
I prefer the old traditional method of teaching	2 (5.7%)	3 (8.6%)	15 (42.9%)	14 (40.0%)	1 (2.9%)
Transiting to ICT in nursing education is preferable	13 (37.1%)	16 (45.7%)	1 (2.9%)	4 (11.4%)	1 (2.9%)
I may not be able to become ICT specialist at this level.	-	3 (8.6%)	24 (68.6%)	7 (20.0%)	1 (2.9%)
We need more time before inclusion of ICT in nursing education.	2 (5.7%)	3 (8.6%)	22 (62.9%)	8 (22.9%)	-
Inclusion of ICT in nursing education is impossible with the electricity situation in Nigeria.	1 (2.9%)	8 (22.9%)	14 (40.0%)	11 (31.4%)	1 (2.9%)
In general, I do not accept inclusion of ICT in nursing education.	4 (11.4%)	-	14 (40.0%)	16 (45.7%)	1 (2.9%)
Each nurse educator should own and operate a computer proficiently.	30 (85.7%)	3 (8.6%)	-	2 (5.7%)	-
I am not using computer hardware and software in teaching and learning but I intend to do so in future.	15 (42.9%)	10 (28.6%)	7 (20.0%)	2 (5.7%)	1 (2.9%)
Using computer hardware and software in teaching will destroy the quality of nursing education.	3 (8.6%)	11 (31.4%)	-	20 (57.1%)	1 (2.9%)

Table 6: Nurse Educators' views on availability of hardware and software for teaching and learning by quantity (n=35)

Types	None	1 – 3	4 - 6	7 – 9	10 & above
I-Pads	30 (85.7%)	3 (8.6%)	2 (5.7%)	-	-
Table PC	27 (77.1%)	5 (14.3%)	1 (2.9%)	1 (2.9%)	1 (2.9%)
Desktop PC	5 (14.3%)	7 (20.1%)	5 (14.3%)	9 (25.7%)	9 (25.7%)
Laptops/Notebooks	10 (28.6%)	12 (34.3%)	4 (11.4%)	5 (14.3%)	4 (11.4%)
Webcam	26 (74.3%)	3 (8.6%)	2 (5.7%)	3 (8.6%)	1 (2.9%)

Table 7: One-sample t-test for significance of knowledge, self-reported skills and availability ratio for ICT related teaching and learning.

Variable n=35	Mean	Std. dev.	Std. error	Expected mean	Mean difference	t-value	P-value
Knowledge of computer.	33.4	10.708	1.810	37.50	-4.071	2.249*	.031
Self-reported skills.	31.4	12.507	2.114	35.00	-3.629	-1.716	.095
Availability ratio	36.2	40.333	6.818	20.00	16.208	2.377*	.023

*Significant at .05 level, P<.05

Table 8: One-way ANOVA of acceptance of ICT in nursing education by years of working experience (categorized) (n=35).

Years of working experience	N	Mean	Std. deviation	Std. error	
1 – 10	23	38.44	4.501	.938	
11 - 20	6	35.17	17.475	7.134	
21 - 30	6	45.50	4.930	2.012	
TOTAL	35	39.09	8.476	1.433	
Source of variation	Sums of square	Degree of freedom	Mean square	F	P-value
Between groups	348.757	2	174.379	2.665	.085
Error	2093.986	32	65.437		
TOTAL	2442.743	34			

IV. DISCUSSION AND IMPLICATIONS FOR PRACTICE

This study was conducted to investigate the required competencies and possible challenges of using ICTs in teaching and learning among nurse educators in Nigeria. Competencies that were examined included knowledge of methods and self-reported skills (searching for information, generating, documenting; retrieval and communicating) for communicating educational instructions electronically; their views on availability of required ICT hardware and software for teaching and learning as well as their acceptability of ICTs in teaching and learning. All the ranks of nurse educators were represented and their age range was 30 – 64 years.

From the findings, majority of the respondents were knowledgeable with internet browsing, Microsoft word and Microsoft power point while knowledge that involved other methods such as that for computer-based test was possessed by only 60% of the respondents. The level of knowledge recorded for use of Cam-studio and Audacity were very poor. This can be an indication that

ICTs usage may be applied by this group of respondents mostly for presentation of papers at conferences since there is this evidence of poor knowledge of ICTs in methods meant for use specifically in developing and communicating educational instructions through e-learning with students. This shortcoming on the level of knowledge was also observed among the respondents with their self-reported skills.

It can be noted that Cam-studio is open source screen-capture video recording software which is meant to create short tutorials, record web-based activity and much more. It has the overwhelming popularity of video and video-based sharing sites that enhances sharing of information on-line. Similarly, Audacity can capture streaming audio, import sound files, edit them and combine them with other files or new recordings and export the recordings in many different file formats including multiple files at once.

These low levels of knowledge in specific areas may be an indication that those methods involving direct communication with students outside the traditional face-

to-face interactions are not practiced. This contradicts the guideline given by the Canadian Nurses' Association (2006) that the requisite knowledge and skills that should be expected of nurses should include use of information and communication technologies to enhance e-learning.

Furthermore, nurse educators may be having the attitude of over-indulgence in the traditional method of teaching students with chalkboard only. This argument remains vital as many of the respondents indicated that they are not using ICTs hardware and software in teaching students. Similarly, 85.7% of the respondents communicated their desire for more time before inclusion or emphasis on use of ICTs in teaching and learning. Thus, apart from the possible lack of knowledge and skills, this may explain the attitudes of the respondents toward the use of ICTs in teaching and learning. It should also be noted that 14.3% of the respondents preferred the old traditional method of teaching without ICTs. This observation implicating attitude corroborates the assertion of Gugerty and Sensmeier (2010) that attitudes toward computers is one of the factors that may limit its use in nursing education arena.

It was also very surprising to observe that up to 14.3% of the respondents indicated none-availability of desktops in their school(s). Many too had no Table PC, laptops, and webcam. Even among those who indicated the availability of these equipments and materials, and given the students' population in each of the institutions covered by the study, the availability ratio was quite low. For instance a mean of 36 students to a computer (36:1) was obtained as against the maximum of 20 students to a computer (20:1) as stipulated by the university regulating commission. This anomaly may not be the problem only in the study area but also in many other training institutions including areas where there is poor maintenance culture. Apart from the fact that individuals will not use facilities that are not available, possession of adequate ICTs knowledge and skills for use in teaching and learning require availability of the equipments and materials in correct quantity and at the right time. This was also the argument of Onu and Agbo (2013) when they observed and commented that scarcity of ICT infrastructures, hardware and software were challenges that limited the use of ICT in promoting teaching and learning in nursing. According to them, these included but were not limited to insufficient or most often complete lack of electric power supply, none-availability of internet facilities, inadequate numbers or complete lack of hardware and lack of access to websites to mention but few of the challenges.

Thus, if nurse educators are to be assisted to remain relevant and keep abreast of societal, educational and healthcare changes globally, the issues of competencies in ICTs knowledge and skills, as well as availability of needed hardware and software must always be addressed.

V. RECOMMENDATIONS

It is recommended as follows:

- i. Nursing education institutions should set in motion policy blue-print to promote use of ICTs in teaching and learning;
- ii. Each educational institution should set up structures, facilities and materials needed for training and re-training of nurse educators in all ICT methods for communicating educational instructions;
- iii. There is need to facilitate discussions on the benefits of using ICTs in teaching and learning;
- iv. There should be deliberate efforts to facilitate the emerging ICTs enabled nursing education institutions;
- v. There is need to promote activities that will assist nurse educators to acquire an understanding of the tools that support use of ICTs in teaching and learning. This can in turn ensure the right attitude toward practice;
- vi. There should be deliberate efforts to ensure adequate availability ratio per student of needed ICTs materials and equipments.

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CONFLICT OF INTEREST

No competing interests.

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