

Perceptions of Teachers of Nigeria Certificate in Education (NCE) Awarding Institutions of their Instructional Technology Competencies in Bauchi State

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Abstract—This study highlighted the concept and applications of ICT in education. The justification of carrying out the research was looked into. The design of the study was a survey method to receive a great deal of information from a large group of individuals and also for the avoidance of major errors. The study employed all the teachers in the NCE awarding institutions in Bauchi state as the population (N=582). Proportionate cluster sampling technique was used to obtain the sample size of 58 respondents. A questionnaire was used to gather the information. And it has undergone face and content validation. Simple mean statistical tool was used in the analysis of data. The findings indicated that the teachers' adequacy in Technology Operations and Concepts at Proficient Stage was adequate but the Technology Operations and Concepts at Advanced Stage was inadequate and also Ethics and Safety and Teaching and Learning with Technology (Proficient and Advanced Stages) were inadequate.

Introduction

Information and communications technology or sometimes called information,

communication and technology (ICT), is often used as a synonym for information technology (IT) but is usually a more general term that stresses the role of unified communications and the integration of telecommunication gadgets such as telephone lines and wireless signals, intelligent building management systems and audio-visual systems in modern information technology. In fact, ICT consists of all technical means that are used to handle information that aid communication, including computer and network hardware, middleware as well as software. In other words, the ICT consists of IT as well as telephony, broadcasting media, all types of audio and video processing and transmission and network based control and monitoring functions (Allah and Ghulam, 2010).

United Nations Educational, Scientific, and Cultural Organization UNESCO (1998) in Jada (2004), described the school environment in Africa and most other developing countries as deficient and lacking basic necessities like water, electricity and textbooks. It has also been stated by Jada (2004), that “in Nigeria, only a handful of schools located in urban centers were connected to the national grid, not to talk of rural schools” Generally three major characteristics are easily identifiable in the Nigeria classroom

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environment especially at the primary level. The most commonly adopted strategy is the usual mechanical teacher led instruction, which tends to relegate learners' contribution to the learning process to the background.

Jada (2004) further asserted that 'the classrooms are mostly deficient and impoverished in terms of basic facilities and amenities required for effective teaching and learning'. Basic facilities required for effective implementation of modern learning approaches as defined by information and communication technology is virtually absent. And considering what is on ground in our school systems, there is a high pupil-teacher ratio in the urban classroom while in the rural schools the reverse is mostly the case (Kitchenham, 2011).

Also Allah and Ghulam (2010) asserted that the common trend in their schools is that the teacher maintains very strong visibility and domination in the learning process. The old practice of the teacher as the major factor in learning still predominates. On the other hand, the learner continues to be a passive participant in the learning process.

One question which one has to address here is this: how qualitative can learning that takes place in an environment as depicted above? To what extent can such environment foster learning in the present era of e-learning?

Instructional technology is used to manage an instruction in vocational and career-technical education and encompasses not only the use of computer but also other technologies and delivery methods.

The career preparation of teachers, universally, is impacted by the opportunities regarding their use of technology and is often dependent on their level of instructional technology knowledge and skill. As Cavanaugh (2004) noted that the use of technology could not be fully effective unless the teachers were adequately trained and supported. Due to the rapid changes in technology and reduced funds, instructional technology competencies' training for teachers is limited. Teachers need instructional technology competencies so that they can use these competencies to teach students effectively.

Instructional Technology

The recent development in ICT have brought recent education concept, and must be sure it is exploited to our benefits. In education such new concepts offer a more effective learning and teaching experiences, which brings about revolutionaries in our educational sector. Since learner participates in the learning process and receive individual attention even when the instructor are at different locations which is not possible in the traditional method of teaching, the atmosphere provided by ICT teaches the learner to think before writing in a disciplined way. Mohammed, (2004) stated that 'there is a reduction in the physical contact but much more intellectual touch'. In a developing nation, microcomputer is beginning to find its way strongly into the school system, we must begin to ask question that are important and raise good comments, if we are to enjoy fully the potential benefits.

By the above submission, instructional technology therefore, is the great enabler and provider for those who have accessibility to it, by this it extends powers of individual perception, comprehension, analysis, thought, concentration, and articulation through a range of activities with the technology that include: writing, visual images, mathematics, music, physical movement, sensing the environment, simulation, and communication (Damsha, 2008). Instructional technology, in all of its ramifications, offers users the tools to access, manipulate, transform, evaluate, use, and present information. Instructional technology in schools includes computers, televisions, video cameras, video editing equipment, and TV studios. According to some empirical indication, students who use technology as a tool may become better at managing information, communicating, and presenting ideas (Pablos, 2011).

Learning in the 21st Century

Change has been the most consistent feature of modern living. The changes have been so intense that people of the world now requires continuous adaptation device to survive in the dynamic world. Information and Communication Technology has continued to pave way in the emerging learning world. With the world remaining consistently dynamic, learning device and approaches have tended to assume an equally dynamic orientation (Nicholson, 2005). Yaro (2013) put that ‘the orientation now is that of learning that is flexible, democratic and personalized to provide people with the opportunity to compete in the emerging world’. The question now is this: what would be the features of learning in the

21st century? Answer to this question shall be the area of interest in this paper.

Teacher vs. ICT.

As already discussed, with the ICT, the physical contact between the learner and the teacher is minimal. Schools should become better equip with ICT resource and teachers become even more expert in using the technology to help themselves deliver well in the class (Streumer,2006). In order to achieve high levels of teacher competence in ICT, there is need to provide training and retraining for teachers in that regard. Effective training and retraining is crucial if teachers are to implement ICT effectively in their professional transactions. Damsha (2008) lamented that ‘if training is inadequate, teachers will not be sufficiently prepared and perhaps not confident to make full use of technology in and out of classroom. Teacher competences with the associated lack of qualities as barriers to the use of ICT in the classroom, the teachers have to be encouraged and motivated adopt their teaching style to the medium of current ICT system in order to remain relevant in the new dispensation.

Nigerian teachers have spent a considerable length of time and energy in face-to-face learning system. The teacher preparation process they went through the old orientation of ‘be all’ in the classroom. It should therefore be expected that they may not be receptive to any approach that might make them less visible in the classroom. Teachers have to be encouraged and motivated to adapt their teaching style to the medium of the current e-learning system and in order to remain relevant in the new dispensation.

The question now is how do we prepare the Nigerian teachers to cope up in the world of e-learning? This question has to

be considered against the background of the environment of the teachers which we have tried to present above.

Purpose and Objectives

The purpose of this study was to explore the perceptions of Bauchi State teachers of NCE awarding institutions on their instructional technology competencies, more specifically; the study will determine: the Bauchi State teachers of NCE awarding institutions of their adequacy in Technology Operations and Concepts, the Bauchi State teachers of NCE awarding institutions of their The populations of this study consisted of all the Bauchi State teachers of NCE awarding institutions; Abubakar Tatari Ali Polytechnic Bauchi, College of Education Azare, Bauchi Institute of Arabic and

adequacy in Ethics and Safety and the Bauchi State teachers of NCE awarding institutions of their adequacy in Teaching and Learning with Technology.

Methodology

This study employed a descriptive survey. An advantage of survey research is the potential to receive a great deal of information from a large group of respondents. To successfully implement the survey study, an understanding and avoidance of major errors is crucial.

Population and Sample

Islamic Studies and Da'awah College of Education Bauchi. The study involved five hundred and eighty two teachers (N=582) in the colleges of the State.

S/N0	NCE Awarding Insttutons	Number of Teachers
1	Abubakar Tatari Ali Polytechnic Bauchi	27
2	Bauchi Institute of Arabic and Islamic Studies	68
3	College of Education Azare	383
4	Da'awah College of Education Bauchi	104
	TOTAL	582

The sampling technique employed in the study was proportionate cluster sampling.

The four colleges were used as clusters as in the table below.

S/N0	NCE Awarding Insttutons	Number of Teachers
1	Abubakar Tatari Ali Polytechnic Bauchi	03
2	Bauchi Institute of Arabic and Islamic Studies	07
3	College of Education Azare	39
4	Da'awah College of Education Bauchi	10
	TOTAL	59

Instrumentation

A questionnaire was designed to gather information about perceptions of Bauchi State teachers of NCE awarding institutions on their instructional Stage, but it was designed to determine the teachers' levels of technology proficiency at the last two stages (Proficient Stage and Advanced Stage) and to identify personal technology professional development needs.

The suitability and clarity of the instrument were assessed through a pilot test with 30 teaching staff of College of Education Technical Gombe state. Internal consistency and reliability was assessed using the pilot test. A useful standard is that the coefficient of reliability should be

technology competencies. The researcher adopted the Massachusetts Technology Self-Assessment Tool in designing the instrument. The instrument is four stages; Early Stage, Developing Technology Stage, Proficient Stage and Advanced

at least 0.50 to 0.60 and preferably higher. Cronbach's alpha reliability on Technology competency needs and coefficients of the instrument was found to be 0.7 which is in the acceptance range.

The mean group score ranking of each statement was based on the following breakdown of the Likert type scale: 1.000 to 1.499 Very Inadequate; 1.500 to 2.499 - Inadequate; 2.500 to 3.499 Adequate; 3.500 to 4.000 – Very Adequate; Upper and Lower points were used during the analysis.

Results

The results of the study are presented in table 2,3,4,5 and 6 below.

Table 2: Mean Score of Technology Operations and Concepts (Proficient Stage)

Ability to	Technology Operations and Concepts	Mean Score	Level of Evidence
1	Save (also retrieve, load, and import) documents in different file formats (e.g., RTF, HTML) to facilitate file sharing	3.04	Adequate
2	Use a variety of external peripherals (e.g., digital camera, camcorder, CD-RW, scanner) and connect them to a computer.	3.00	Adequate
3	Resolve commonly occurring technology problems, and use proper terminology for communicating them (e.g., frozen screen, disk error, printing problems).	2.90	Adequate
4	Identify, download and use multimedia, graphic, sound and video files	3.30	Adequate
5	Install new software from a variety of sources (e.g., CD, downloads, plug-ins and applications) per district policies.	3.33	Adequate
6	Use built-in calculating functions in a spreadsheet application	2.04	Inadequate
7	Customize formatting of charts or graphs created in spreadsheet. Define and use built-in	3.42	Adequate

8	data functions of a spreadsheet such as sort, filter, find. Perform simple operations in a database (e.g., browse, sort, search, delete, add data, define field formats, etc.).	3.26	Adequate
9	Create a multimedia presentation that includes imported sound and graphic files, tables and a design template.	3.49	Adequate
10	Demonstrate effective search strategies to locate and retrieve electronic information (e.g., use syntax and “Boolean logic operators-and/or terms” correctly).	2.00	Inadequate
11	Share links among users via email or posting	3.34	Adequate
12	Create a basic Web page	2.03	Inadequate
	GRAND MEAN	2.93	Adequate

Table 3: Mean Score of Technology Operations and Concepts (Advanced)

Ability to	Technology Operations and Concepts	Mean Score	Level of Evidence
1	Troubleshoot and add new hardware	2.13	Inadequate
2	Identify and use methods for transferring, downloading, and converting graphic, sound, and video files. Use different graphic file formats where appropriate (e.g., PICT, TIFF, JPEG).	2.50	Adequate
3	Import/export and link data between spreadsheet, databases and other applications, including presentation applications.	2.50	Adequate
4	Design, create and manipulate an original database.	2.03	Inadequate
5	Create and post a Web page.	2.06	Inadequate
	GRAND MEAN	2.24	Inadequate

Table 4: Mean Score of Ethics and Safety (Proficient)

Ability to	Ethics and Safety	Mean Score	Level of Evidence
1	Use specific assistive technology software (e.g., programs that use pictures/symbols with words, talking word processing, or word prediction).	2.06	Inadequate
2	Address situations where inappropriate sites are accessed, and contact proper district personnel to block such sites.	2.04	Inadequate
3	Demonstrate and teach students the issue of ergonomics (e.g., repetitive stress injuries) and how to use equipment safely.	2.02	Inadequate
	GRAND MEAN	2.04	Inadequate

Table 5: Mean Score of Ethics and Safety (Advanced)

Ability to	Ethics and Safety	Mean Score	Level of Evidence
1	Manage assistive technology equipment and install peripherals for diverse learners (alternative keyboards, voice recognition, and scanners with OCR software).	2.42	Inadequate
GRAND MEAN		2.42	Inadequate

Table 5: Mean Score of Teaching & Learning with Technology (Proficient)

Ability to	Teaching & Learning with Technology	Mean Score	Level of Evidence
1.	Evaluate technology resources, including online resources for accuracy and suitability.	2.51	Adequate
2.	Plan for the management of technology resources within the context of learning activities (schedule use of computer lab, wireless laptops, Smart Board, etc.).	2.56	Adequate
3.	Use technology to support learner-centered strategies that address all students.	2.54	Adequate
4.	Manage student learning experiences that integrate effective uses of technology to meet a variety of learning styles.	2.59	Adequate
5.	Use the Internet for curriculum development and instruction (e.g. Web Quests, classroom web pages)	2.80	Adequate
6.	Use appropriate technology tools to enhance one's own curriculum, if applicable: projectors, wireless laptops, handhelds, environmental probes, sensors, robotics, dynamic geometric software, and measuring devices.	2.04	Inadequate
7.	Use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.	2.57	Adequate
8.	Identify and evaluate developing technologies as they relate to one's subject area, grade level and student population.	2.21	Inadequate
9.	Manipulate data using charting tools and graphic organizers (e.g., concept mapping, and outlining software) to connect ideas and organize information.	2.27	Inadequate
10.	Use electronic conferencing tools such as Internet bulletin boards as in VES and MyBPS.	2.44	Inadequate
11.	Apply technology professional development activities such as multimedia presentations, Web Quests, lessons in the classroom.	2.06	Inadequate
GRAND MEAN		2.42	Inadequate

Table 6: Mean Score of Teaching & Learning with Technology (Advanced)

Ability to	Teaching & Learning with Technology	Mean Score	Level of Evidence
1	Use technology to challenge students to use higher order thinking skills and creativity (e.g., applets and programs that require the application of logic to solve problems).	2.34	Inadequate
2	Develop web pages for instruction and communication.	2.02	Inadequate
3	Use specialized technology tools for problem solving, decision-making, and creativity (e.g., simulation software, environmental probes, computer-aided design, geographic information systems, dynamic geometric software, graphing calculators, art and music composition software)	2.17	Inadequate
4	Routinely and rigorously identify, evaluate, and apply emerging technologies as they relate to teaching and learning.	2.34	Inadequate
5	Combine information from different applications (e.g., a chart imported from a spreadsheet into a word-processed report can be linked to update automatically when the data is changed in the spreadsheet) to enhance/clarify communication of information.	2.15	Inadequate
6	Present information, ideas, and results of work using the most appropriate communications technologies (e.g., multimedia presentations, Web pages, digital videotapes, desktop-published documents).	2.35	Inadequate
1.	Use electronic communications to enhance teaching and learning, (e.g. listserv, electronic classrooms,	2.34	Inadequate
2.	Design and deliver effective staff development in technology and its integration in curriculum	1.03	Very Inadequate
	GRAND MEAN	2.09	Inadequate

Findings

The findings of the results indicated as follows:

- Mean Score of Technology Operations and Concepts at Proficient Stage was found to be adequate (mean **2.93**), but their ability to use built-in calculating functions in a spreadsheet application, their ability to demonstrate effective search strategies to locate and retrieve electronic information (e.g., use syntax and “Boolean logic operators- and/or terms” correctly)
- and their ability to create a basic Web page were all found to be inadequate (means 2.04, 2.00 and 2.03 respectively).
- Mean Score of Technology Operations and Concepts at Advanced Stage was found to be inadequate (mean **2.24**)
- Mean Score of Ethics and Safety (Proficient and Advanced Stages) were found to be inadequate with the mean (2.04 and 2.42) respectively.

- Mean Score of Teaching and Learning with Technology (Proficient and Advanced) were also found to inadequate (means 2.42 and 2.09) in that order.

Discussion

It has been identified that the ability to use built-in calculating functions in a spreadsheet application, and window) and ability to explain their functions, to demonstrate effective search strategies to locate and retrieve electronic information (e.g., use syntax and “Boolean logic operators- and/or terms” correctly) and their ability to create a basic Web page were found inadequate. This is a clear justification of the assertion of Yaro (2013), “ due to the rapid changes in technology and reduced funds, instructional technology competencies' training for teachers is limited”.

The other competences that were found inadequate include Technology Operations and Concepts at Advanced Stage. This include: ability to troubleshoot and add new hardware, ability to design, create and manipulate an original database and ability to create and post a Web page. These in competences in technology might not be unconnected with the Damsha (2008) lamentation that teachers will not be sufficiently prepared and perhaps not confident to make full use of technology in and out of classroom.

Similarly, it was found out that the Ethics and Safety at Proficient and Advanced Stages were inadequate. The operations include use of specific assistive technology software (e.g., programs that use pictures/symbols with words, talking word processing, or word prediction), address situations where inappropriate sites are accessed, and contact proper district personnel to block such sites, demonstrate and teach students the issue of ergonomics (e.g., repetitive stress injuries) and how to use equipment safely and Manage assistive technology equipment and install

peripherals for diverse learners (alternative keyboards, voice recognition, and scanners with OCR software). Generally, these operations proved to be difficult to the teacher. They are not only difficult but not known by the teachers.

The inabilities mentioned above are supporting the Allah and Ghulam (2010) assertion that the common trend in the schools is that the teacher maintains very strong visibility and domination in the learning process. The old practice of the teacher as the major factor in learning still predominates. On the other hand, the learner continues to be a passive participant in the learning process.

Conclusion

The acceptability and quality of the electronic-based learning, as in every form of training, is based on content and delivery. Even though ICT can suffer from many of the same obstacles as that of classroom training, such as boring, monotonous, and little opportunity for interaction. The good things about ICT, is that the program allows the creation of very conducive learning environments that can capture and retain the interest of the learner towards the material.

It is evidently seen that the Nigeria teachers have spent a considerable length of time and energy in the traditional method of teaching (face-to-face learning system). The teacher preparation process they went through the old orientation of ‘be all’ in the classroom.

Based on the findings it should therefore be assumed that the teachers may not be receptive to any approach that tends to make them less visible in the classroom.

Recommendations

Teacher competences with the associated lack of qualities as barriers to the use of ICT in the classroom, the teachers have to be encouraged and motivated adopt their teaching style to the medium of current ICT system in order to remain relevant in the new dispensation. This can only be possible by attending seminars, workshops and providing short courses on ICT by the teachers during long vacations. The teachers, on their own, should embrace self development strategies on ICT so that they can be relevant wherever, whenever, whatever and whoever and avoid any possible danger of retrenchment by the employers.

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