Assessment of Teachers' ICT Readiness for Basic Technology Instruction in Junior Secondary Schools: A Case Study of Abeokuta South Local Government Area, Ogun State, Nigeria

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Abstract

This study assessed the teachers' ICT readiness for Basic Technology (BT) instruction in junior secondary schools: a case study of Abeokuta South Local Government Area in Ogun State, Nigeria. The sample population, which was purposively selected comprises 10 BT teachers from 5 public and 5 private junior secondary schools in the LGA used for the study. They consist of both male and female teachers. The study was an ex post facto type and also a case study, thus, the paucity in the number of the participants. A structured questionnaire tagged Teachers' ICT-Readiness Questionnaire (TICTRQ) with a total Cronbach Alpha coefficient of 0.81 was used to collect data. Two hypotheses were tested at 0.05 level of significance. Findings showed that, male teachers were more fully ready and prepared to utilise ICT facilities for BT instruction than their female counterparts with the result t-cal = 2.46 greater than t-crit = 1.51, df = 8. Also finding revealed that, teachers in private JSS were more prepared and fully ready to utilise ICT facilities for BT instruction more than their counterparts in public JSS with the result t-cal = 1.72 greater that t-crit = 1.33, df = 8. Therefore, recommendations were proffered that teachers and students in both public and private JSS need to be more ICT-compliant and in fact, more techno-phile for the utilization of ICT facilities for BT instruction and other school subjects in Ogun State particularly and Nigeria generally.

Background to the study

The use of Information and Communication Technology (ICT) in Nigeria and African countries generally is increasing and dramatically growing. However, there is a great deal of knowledge about how Information and Communication Technologies (ICTs) are being used in developed countries as well as information on how ICTs are being used by teachers in developed countries to carry out their teaching and learning activities across the globe (Hooker, 2009). On the other hand, in developing countries like Nigeria, there is not much information on how ICTs are used by teachers to carryout their teaching and learning process. Uwameiye (1993) opined that, basic technology helps students in junior secondary schools (JSS) to explore the world of work, make intelligent career choices, and develop informed patterns of consumption. Thus, BT exposes teachers at the Junior Secondary School level to technology through exploratory activities by utilising ICT facilities to better widen teaching and learning process of students at JSS classes. This helps to develop good attitudes in the students towards technology exploration and the industry. Also, the teaching of BT by teachers in using ICT

facilities at the JSS level in Nigeria supports achievement of Nigeria's quest to build individuals (students) who will adjust to the changing environment, deal with forces which influence the future and participate in controlling his/her own destiny (Okebukola and Jegede, 1997).

Hence, Jung (2005) described the needs for the teaching BT instruction at the Junior Secondary School level as necessity to reduce ignorance about technology and lay a solid foundation for true national development. Therefore, BT is offered in the JSS as core subject like mathematics and science thus the utilisation of ICT facilities like the internet, phone (sms, picture, voice record, browse, etc), computers, multimedia projector, chips, memory cards, among others. These will enhance effective teaching and learning of basic technology by pedagogically trained BT teachers in the junior secondary schools (JSS).

The Federal Ministry of Education (FGN) (2000) stated that, the three main objectives of BT are to: (i) provide pre-vocational orientation for further training in technology, (ii) provide basic technological literacy for everyday living, and (iii) stimulate creativity. The achievement of these objectives stated above will in no small way help to transform Nigeria into a technologically developed country. To achieve this goal, the teaching of BT must be ICT-compliant to those of developed countries across the world that explored fully multimedia learning environment such as e-learning, e-mail, mobile learning and lot more on teaching that seeks to make the learning of BT functioning effectively.

The change from teacher-centred education system to learner-centred education, the world over, in the past few years, contributed to the use of ICT in education as a result of the development of ICT in various sectors among developed and developing countries. More so, pertinent to Hawkins (2005) views, it means that, education reform practices should focus on equal access and quality of education which should highlight the importance of change in the education sector through use of ICT and equipping new generations with enhanced skills to operate in the 21st century.

Clark and Starr (1986) defined teaching as an attempt to assist students in acquiring or changing some skills, knowledge, ideal, attitude or appreciation. Also, teaching is a challenge that requires long hours of work and preparation. In other words, the master-mind of effective teaching depends mainly on the pedagogical teachers whose prowess in the use of ICT facilities must be in conjunction with the students activities. As a matter of fact, teaching is a continuous, cyclic process involving three phases: (i) pre-teaching, during which the teacher plans what to teach and prepares or collects the materials to be used for teaching. (ii) class room interaction, during which there is purposeful interaction between the materials, the subject-matter, the learner and the teacher, and (iii) post-teaching during which the teacher reflects on the task just completed and feeds back his/her observation into planning the next lesson. However, all teaching is carried out for a purpose, that is to generate learning in students in order to produce educated persons (Clark and Starr, 1986).

ICT (Information and Communication Technology) is the way forward for the improvement in our educational system. Multimedia technology affords teachers and students a lot of opportunities for effective learning outcomes. E-learning is an example of the use of these ICT-supported teaching and learning

methods whose use in educational institutions is gaining momentum with the passage of time (Omwenga, 2004).

Multimedia is a carefully woven combination of text, graphic, art, sound, animation and video elements. It is an integration of multiple media elements (audio, video, graphics, texts, animation, etc) into one synergetic and symbiotic while that results into more benefits for the end users than any one of the media elements can provide individually (Barton, 2007). This device is used in basic technology instruction is expected to foster teacher's presentation and enhance students' learning outcomes.

The benefits of utilising ICT facilities to teachers in basic technology instruction are also numerous and they include: creativity, time saving, replacement of ineffective learning activities, making lessons more interesting, more enjoyable and motivating for both teachers and learners (Barton, 2007).

However, are the teachers for basic technology instruction in Nigeria ready to acquire the basic skills in utilising ICT learning process? Are they ready to integrate ICT facilities available and accessible to teachers and students in the public and private secondary schools in Nigeria and particularly in Ogun State? All these were investigated in this study.

Also, gender among the teachers seems to be one of the major controlling factors in the ICT facilities utilisation for the basic technology instruction. Male teachers are found to be more ICT compliant than their female counterparts (Barton, 2007). In fact, he opined further that, male teachers are techno-phile, while female are techno-phobic, thus, the former are more fully ready and prepared to make use of ICT facilities in their instructions than the latter. More so, basic technology as subject is more masculine inclined and less feminine oriented, hence, very few female teachers are found teaching the subject in Nigeria secondary schools.

However, talking of gender equality, thus, the situation is changing in the favour of them. that is, more female teachers are now being pedagogically trained as basic technology instructors. Therefore, more female teachers are in vogue, in the secondary schools in Nigeria teaching basic technology than in the recent past (Wasiu, 2013).

In Nigeria, there are two major types of secondary schools namely: public and private secondary schools. The former are controlled and funded by government (local, state, federal), while the latter are owned and managed by the private individuals, religious organisations and corporate bodies. However, the privately owned secondary schools in Nigeria seem to be more adequately funded and managed by their owners than the public ones. Hence, most of the private secondary schools in the country are more equipped with various facilities particularly ICT facilities than their public counterparts, may be, one of the strategies to attract their prospective customers (students). Therefore, this study investigated the school type (public and private) also as one of the controlling variables that are most likely to affect the ICT readiness of teachers and students in basic technology instruction in Nigeria.

Statement of the problem

This study examined teachers' ICT readiness for basic technology instruction in Junior Secondary Schools in Ogun State, Nigeria. There is the need for computer literacy, if BT instruction will be effectively delivered within teaching and learning activities.

Also, if a country like Nigeria (developing) will move on with her contemporaries across the world it must be 21st century class room compliant like United Kingdom (UK-developed) where ICT facilities like computers are majorly used for instructions. However, some of the BT teachers and students may lack the basic computer literacy skills which will enable them to use computer knowledge and retrieve their needed information from electronic resources. Likewise, some of the teachers and students might have been hindered due to inadequate access to ICT facilities. This may affect their use of ICT facilities for BT instruction. It is in the light of this, that this study investigated the teachers' ICT readiness for BT instruction in terms of ICT-facilities, ICT-acceptability, computer literacy, and ICT-accessibility at the Junior Secondary School level in Ogun State. Also, gender and school type were examined as controlling variables.

Research hypotheses

The following hypotheses were tested in the study at 0.05 level of significance:

H01: There is no significant difference in the ICT-readiness for basic technology instruction between the male and female teachers in public and private Junior Secondary Schools in Abeokuta South Local Government Area of Ogun State, Nigeria.

H02: There is no significant difference in the ICT-readiness for basic technology instruction between teachers in the public and private junior secondary schools in Abeokuta South Local Government Area of Ogun State, Nigeria.

Research design

A descriptive design of *expo-facto* type was adopted in the study because the existing variables were investigated in the study such as, ICT readiness, school type and gender. Also, there was no manipulation of any variable in the study. More so, the study is a case study type.

Sample and sampling technique

The sample population comprises 10 basic technology teachers who were purposively selected from 5 public and 5 private junior secondary schools in Abeokuta South Local Government Area, Ogun State. They consisted of male and female teachers. The schools selected were those with pedagogically trained basic technology teachers with minimum of 5 years of working experience in the secondary school settings. At the time when this study were carried out, only 5 public and 5 private schools met this condition stated above. Thus, a case was conducted.

Research instrument

A structured questionnaire was used to collect data viz: Teachers' ICT-Readiness Questionnaire (TICTRQ). The questionnaire consists of three sections A, B, and C. Section A contains bio-data of the respondent viz: sex, age, school type (public/private), and religion. Section B is made up of 30 items of 4 likert format: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) on ICT-Readiness of teachers and students. Section C consists teaching methods and ICT facilities such as computer, internet, mobile phone, digital camera, multi-media and interactive board.

Validation and reliability of instruments

The questionnaire TICTRQ was given to the experts in basic technology and ICT for proper scrutiny. Based on their suggestions and criticisms, items in the

questionnaire were modified. For the reliability, the questionnaire TICTRQ was trial-tested on sample BT teachers, apart from those used for the study. The data collected were subjected to Cronbach Alpha Coefficient with the results in sections B and C 0.81 and 0.85 respectively which were found reliable and appropriate for the study.

Data collection procedure

The investigator visited the selected schools to seek for permission from the appropriate authorities after which the questionnaires were personally distributed by the investigator to BT teachers. The ten questionnaires were collected on the spot to minimise missing cases. The response rate was 100 per cent. The data collection lasted more than two weeks.

Data analysis

The data collected were analysed based on the tested hypotheses.

H01: There is no significant difference in the ICT-readiness for basic technology instruction between the male and female teachers in public and private junior secondary schools in Abeokuta South Local Government Area, Ogun State, Nigeria. Table 1 shows the finding.

Table 1: T-test Analysis of Male and Female JSS Teachers' ICT Readiness for BT Instruction

School	N	Mean	SD	t. Cal	t.Crit	Df	Remark
Male	6	2.37	1.158				
Female	4	2.01	1.128	2.462	1.51	8	Significant

Table 1 reveals significant difference in ICT readiness for BT instruction between male and female JSS teachers with the result t-cal = 2.46 greater than t-crit = 1.51, df = 8 at 0.05 of significance. Hence, the null hypothesis is rejected. Therefore, it connotes that, the male teachers are ready to utilise ICT for BT instruction more than their female counterparts with the mean value of 2.37 for the former and 2.01 for the latter.

H02: There is no significant difference in the ICT readiness for BT Instruction between teachers in the public and private junior secondary schools in Abeokuta South Local Government Area, Ogun State, Nigeria. Table 2 presents the finding.

Table 2: T-test Analysis of ICT readiness for BT Instruction between Teachers in Public and Private JSS

School	N	Mean	SD	t. Cal	t.Crit	Df	Remark
Public	5	2.41	0.211				
Private	5	2.68	0.111	1.721	1.33	8	Significant

* Significant at $p<0.05$.

Table 2 indicates significant difference in ICT readiness for BT instruction between teachers in the public and private junior secondary schools in Abeokuta South LGA of Ogun state with the result t-cal = 1.72 greater than t-crit = 1.33, df = 8 at 0.05 level of significance. Hence, the null hypothesis is rejected. Therefore, it implies that teachers in private JSS are ready and fully prepared to utilise ICT-facilities for BT instruction more than their

counterparts in the public JSS with the mean values of 2.68 and 2.41 for private and public JSS teachers respectively.

Discussion of findings

The discussion is presented in line with the variables investigated in the study. That is gender and school type. The finding showed that most male and female BT teachers have access to ICT facilities in the public and private JSS in the LGA used for the study. However, it was discovered that, male teachers were more ICT compliant and techno-phile than their female counterparts. This finding corroborates that of Egunjobi and Awodele (2012) that male teachers are more ICT-friendly and compliant than their female counterparts in the utilisation of ICT facilities for school subjects instruction. Finding also revealed that there was a significant difference in the ICT-readiness of teachers in public and private JSS for BT instruction in the LGA used for the study. The finding supports that of Egunjobi and Oseni (2012) that teachers in private JSS in Nigeria are more ICT-compliant and in fact, fully ready to utilise ICT facilities for school subject instructions particularly that of social studies.

By and large, gender and school type are among the factors to be considered for the assessment of teachers ICT-readiness for the deployment of ICT in school subjects instructions in Nigeria.

Conclusion

Based on the findings of this study, the following conclusions were drawn:

(i) Readiness to utilise ICT facilities for BT instruction fosters the teachers' presentations and enhances the students academic performance.

(ii) The readiness of teachers to use ICT facilities for instructions supports teaching and learning activities of the students thus enables the teachers to achieve their instructional objectives maximally.

(iii) Integration of ICT facilities in teaching and learning process enhances teachers' delivery of BT instruction to their students.

(iv) Teachers' readiness to utilise ICT facilities for BT instruction fosters collaboration and sharing of knowledge among users.

(v) Readiness of teachers to use ICT facilities for BT instruction improves teachers' pedagogical practices.

Recommendations

Based on the findings of this study, the following recommendations were proffered.

(i) Teachers in both public and private secondary schools in Nigeria should be encouraged by their owners to be more ICT complaints by organising workshops, conferences and periodic trainings in the utilisation and integration of ICT facilities into their instructions particularly in basic technology and even other school subjects.

(ii) Both male and female basic technology teachers in the country should be more ready and fully prepared to utilise ICT facilities for their instruction so as to be at par with their counterparts in technological advanced countries of the world. Also, to foster their presentation and enhance the students' learning outcomes in basic technology.

(iii) Government and private owners of secondary schools in Nigeria should try as much as possible to fund their schools adequately

and manage them properly. The schools should be sufficiently equipped with various facilities most especially ICT facilities for both teachers and students' use as collaborative learning tools.

(iv) Male sterotype in the basic technology instruction in Nigeria should be put into oblivion by encouraging female teachers to be pedagogically trained as basic technology teachers who are also ICT-inclined.

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