A Study of the Information and Communication Technology Use among Student-Teachers in Universities in North Central Nigeria

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ABSTRACT

This study investigated the study of the information and communication technology use among student-teachers in universities in north central Nigeria. Also the influence of gender on the student-teachers' use of ICT. The study was a descriptive survey type. A total of 638 student-teachers were sampled using stratified random sampling technique. Research question 1 was answered using mean, hypothesis 1 was tested using t-test, while hypothesis 2 was tested using analysis of variance (ANOVA) . The findings of the research showed that university student-teachers in North Central Nigeria are average in their ICT use. There was also no significant difference established in the use of ICT between male and female student-teachers and neither was there any significant difference in the use of ICT by student-teachers in Arts, Sciences, and Social Sciences. The implication of the findings is that there efforts should be made by the universities to make the student-teachers imbibe the culture of integrating ICT into pedagogy and other educational activities.

Keywords: ict, use of ict, student-teachers, influence of gender, universities in north central nigeria.

1.0   INTRODUCTION

Rapid developments in technology has led to tremendous changes in the way we live, the social and educational demands of the society. In line with the impact of new technologies in workplaces and everyday life, teacher education institutions try to improve their educational programmes and classroom facilities in order to minimize the teaching and learning technology gap between the present and the future. This improvement process requires effective integration of technologies into existing content in order to provide learners with technological skills needed in their specific subject areas so as to promote meaningful learning and also enhance professional development (Tomei, 2005).

Information and communication technology has become a leading engine of economic growth of any nation. This is because digital content is an important factor driving growth and employment with widespread impact on business, government and society. According to Angel (2008), the world is gradually being saturated with information. The wonders of computer and internet facilities and their bizarre and astounding functions in the social, political and economic circles cannot be overemphasized. Obviously, advances in information and communication technology are reshaping the socio-economic, political and technological landscape of human endeavor. The inevitability of the application of information technologies to education has therefore remained incontestable and incontrovertible. That is why faculties of education in the universities in Nigeria are making frantic efforts to automate their operations. There are many challenges that have been posed for human resource development in the education industry by the automation (Badru, 2002).

Moyo (1996) noted that advances in information and communication technology have made it necessary for universities and other institutions involved in teacher training programmes to be actively engaged in the use of ICT. This view is further supported by Adam (1999) who observed that with the proliferation of computer software in the market, consumers continue to rely on the software vendors for knowledge of not only how to operate the new software, but also how to profitably optimize its use. In Organization for Economic Cooperation and Development (OECD) countries, research consensus holds that the most effective uses of ICT are those in which the teacher, aided by ICTs, can challenge students' understanding and thinking, either through whole class discussions or individual and small group work using ICTs. ICTs are seen as important tools to enable and support the move from traditional teacher-centered teaching styles to more learner-centered methods (Bruce, 1998). Dede (1998) asserted that pedagogical practices of teachers using ICT can range from only small enhancements in teaching practices using what are essentially traditional methods, to more fundamental changes in their approach to teaching. ICTs can be used to reinforce existing pedagogical practices as well as to change the way teachers and students interact.

Many countries in the world, for example, Nigeria, have been driven to re-position their educational system in

order to be competitive (Agboola, 2006). Without any gainsaying, ICTs have been established as important tools for enhancing pedagogy. Numerous benefits associated with the use of ICTs in education have been highlighted by different authors. For instance, Chaverz (1997) noted that internet and computer usage has impacted positively on critical thinking, problem solving, prompt feedback and networking. Oyelaran-Oyeyinka and Lai (2006) also noted that the internet has the potential to increase students' access to education, improve curriculum and quality of instruction and increase productivity of academic publications. Similarly, Ramayah (2003) reported that most students use internet because of the perceived effectiveness of the facility in information access on assignment and research projects.

However, the resource and infrastructural constraints prevalent in developing countries like Nigeria make it unnecessarily challenging for stakeholders to deploy ICTs for teaching and learning (Oyelaran & Lai, 2006). It is within this context that a study of teachers' readiness to optimize this new ICT-driven pedagogical paradigm in Nigeria is well-placed. According to Awodeji (2007), the strength of a society is mostly measured by its technological strength. He also stressed that the change that occurs in a society which can be social, economical, educational, religious, and cultural, is due to this "powerful tool'' called technology. Information and communication technology does not only bring about change in our communication and information acquisition but also changes the way we think and how we view our world. He further observed that a nation or society can be developed by the country's technological advancement for if a nation is not developed technologically such a nation will always be dependent on foreign hands.

Mannel (1996) argues that developing countries such as Nigeria cannot afford the business of training ineffective teachers. Nigeria needs teachers who are also information and communication technology competent and who can restructure and package information for teaching and learning in the classroom. The training of student-teachers in the use of ICT has become inevitable because of changes in the outlook of teaching and learning. In order to provide the enabling environment for ICT in the training of teachers, it has become a necessity for universities to train and educate their academic and service staff in line with the latest technological advances in information and communication technology field.

Gender issues have been linked with performance of students in academic tasks in several studies but without any definite conclusion. However, there is a general conclusion that general imbalance exists in computer use, access, career and attitude. The current gender imbalance in technology and the role that technology will play in the future should be a concern for men and women, educators, policy makers and parents. Gender and technology development serve as forum for exploring the linkage between changing gender relations and technological development (Ewhrudjakpor, 2006). That is to say, the activities of women and men are linked to institutions or governments, on the basis of technology, social relations and management.

Women tend to have less access than men to ICT facilities that do exist. Frequently, rural information centers or cyber cafés are located in places that women may not be comfortable frequenting, since most communications facilities in rural areas are shared public access. Women also have problems of time. Given multiple roles and heavy domestic responsibilities, their leisure hours are few, and the center may not be open when women can visit them or they may be open in the evenings when it is problematic for women to visit them and go back safely to their homes in the dark. Their mobility (both in the sense of access to transportation and ability to leave the home) is also more limited than that of men. Some accommodations that may be needed to ensure gender equality in access and use of ICTs need adaptation of schedules to suit women's hours and availability of women support staff and trainers (Tinio,2003). The issue of gender has been a point of concern to researchers in recent times and this will be investigated in this study.

2.0   STATEMENT OF THE PROBLEM

No education system may rise above the quality of its teachers (FRN, 2004). Hence the poor performance of students in SSCE examinations could be a reflection of the quality of teachers produced by universities and colleges of education. Several research reports have indicated that students perform poorly in WAEC and NECO SSCE examinations (Nsofor, 2006; Ibrahim, 2010; and Ezenwa, 2005). The search for instructional strategies that can improve students' performance has clearly shown that computer-based instructional strategies have been found to improve students' performance more than traditional teaching method. (Yaki, 2011 and Gambari, 2010). In addition, it is reported that students' abilities and skills in scientific investigations are greatly enhanced by the use of computer (Gambari, 2010).

    Since ICT has found its way into the classroom as a tool for enhancing teaching and learning, it is expected

that prospective teachers who are to use the technology should be literate and competent in its use for better productivity. Student-teachers will one day become qualified teachers and they will be expected to use technology for classroom instruction and for administrative purposes. Their ability to use this technology will depend on the extent to which they are literate in it.

3.0   PURPOSE OF THE STUDY

The research investigated the study of the information and communication technology (ICT) use among student teachers in universities in north central Nigeria. Specifically, the study examined:

1.   The student-teachers use of ICT.
2 .   The influence of gender on the student-teachers' use of ICT.
3 .   The influence of areas of specialization on student-teachers use of ICT.

4.0   RESEARCH QUESTIONS

1.   What is the student-teachers' level of ICT use?
2.   Does the student-teachers' usage of ICT vary based on gender?
3.   Does the student-teachers' area of specialization influence their use of ICT?

5.0   RESEARCH HYPOTHESES

Based on the research questions above, the following hypotheses were generated:

Ho_1There is no significant difference in the use of ICT between male and
  female student teachers.

Ho_2There is no significant difference in the use of ICT among student teachers in the Arts, Sciences and Social Science.

6.0   RESEARCH METHODOLOGY
6.1   Research Design

This research is a descriptive research of the survey type. The survey involved the use of an investigator-designed questionnaire to collect necessary information on student-teachers' use of ICT . Copies of the questionnaire were distributed to student teachers in sampled universities within the North-central geo-political zone of Nigeria so that they could fill in their responses to the questions raised on the various components of ICT literacy, as it applied to each one of them. These responses were then analyzed to arrive at generalizations that describe their use of ICT .

7.0   SAMPLE AND SAMPLING TECHNIQUE

The population for this study consisted of all student teachers in conventional universities in the North Central zone of Nigeria. However, the target population comprised the 200,300 and 400 level student-teachers in the North Central Universities. Students were selected from universities offering education courses, through a stratified random sampling technique. A sample size of 638 student-teachers was captured for the research study.

8.0   RESEARCH INSTRUMENT

The instrument used for the study was an investigator-designed questionnaire named ICT Literacy Level Questionnaire (ICTLLQ). It is an eclectic instrument with items drawn from the existing instrument of Yusuf (2004), Olumorin (2008), and UNESCO's survey instrument for ICT literacy (2010). The instrument contains six sections A, B, C, D, E and F.

Section A deals with respondents' bio-data information on the institution and respondents' area of specialization, gender and where they learnt about computer and mode of admission to the University. Section B requests for information on respondents' access to some ICT applications, programmes and supporting devices. Respondents are expected to choose a response mode that best describes where they currently see themselves in terms of access to the listed computer applications, programmes and supporting devices. It contains 28 items with live response modes of Personal Computer (PC), Family Computer (FC), Friends' PC (FPC), School's Computer Room (SR) and Business Centre (BC), with corresponding ICT literacy levels of 5, 4, 3, 2 and 1 respectively. Section C requests for information on respondents' level of

literacy on basic ICT operations. It contains 12 items. The response modes for this section are: Advanced (A), Moderately Skilled (MS), Know the Basics (KB), and No Competence (NC), with corresponding ICT literacy levels of 4, 3, 2 and 1 respectively.

In section D, respondents were expected to provide information on their competence in integrating ICT into instruction. It contains 18 items. The response modes for this section are: Highly proficient (HP), Proficient (P), Somewhat (S), and Not at all proficient (NAP), with corresponding ICT literacy levels of 4, 3, 2 and 1 respectively. Section E requests for information on the student-teachers' use of ICTs to create and develop new applications, contents, learning materials, etc. It contains seven items. The response modes for this section are: Highly proficient (HP), Proficient (P), Somewhat (S), and Not at all proficient (NAP), with corresponding ICT literacy levels of 4, 3, 2 and 1 respectively. Section F requests for information on the student-teachers level of skills in using some instructional packages. It contains five items. The response modes for this section are: Highly proficient (HP), Proficient (P), Somewhat (S) and Not at all proficient (NAP), with corresponding ICT literacy levels of 4, 3, 2 and 1 respectively. For the sections having four response modes in the questionnaire, the ICT literacy level of 4 and 5 have been collapsed into one, and that is level 4.

9.0   PROCEDURE FOR DATA COLLECTION

Data were collected by the investigator and research assistants drawn from the sampled universities . First, permission was sought from the administrators of the Faculties of Education in the universities concerned. The sampled universities were visited by the investigator. The instrument was administered to respondents and retrieved immediately after the respondents had filled them. The study was conducted over a period of thirteen weeks. During this period, the investigator went round all the sampled institutions to administer the instrument. The services of research assistants were employed in retrieving the questionnaire from the respondents.

10.0   RESULTS

Data obtained in respect of research question 1 was analysed using mean and percentage while t-test was used to analyse hypotheses 1 . Hypotheses 2 was analyzed using Analysis of Variance (ANOVA). The results of the analyses and discussions are as stated below.

Hypothesis One

$H0_1$: There is no significant difference in the use of ICT between male and female student-teachers.

To test for this hypothesis, t-test was used to analyze the mean scores. The result of the analysis is shown   in table 1.0

Table 1.0: t-test of the Level of ICT Use of Student-Teachers Based on Gender.

Gender	N	df	mean	Sd	t-cal	Sig(2-tailed)
Male	360		57.25	13.89		
		636			0.870^{ns}	0.385
Female	278		56.23	15.58		

Ns= not significant (p>0.05)

Table 1.0 shows the mean scores of male and female student-teachers on ICT usage. The means scores for the male and female student-teachers were 57.25 and 56.23 respectively. Table 1.0 reveals that the male mean score did not differ significantly from the female mean score on their level of ICT use (t = 0.870; df=636, p > 0.05).Therefore, hypothesis one, which states that there is no significant difference in the use of ICT between male and female student-teachers was upheld. This implies that the student-teachers' level of ICT use does not vary based on gender.

Hypothesis Two

Ho_2: There is no significant difference in the use of ICT by student teachers in Arts, Sciences and Social Sciences.

To test for this hypothesis, ANOVA was used and the result is shown in table 2.0

Table 2.0: ANOVA Comparison of Difference Among Arts, Sciences and Social Sciences Student-teachers on their Use of ICT.

Sources of variables	Sum of squares	df	Mean square	F-cal	Sig.
Between Groups	197.936	2	98.968		
Within Groups	139207.472	636	219.224	0.451	0.637
Total	139405.408	638			

Ns= not significant (p>0.05)

Table 2.0 presents the ANOVA result of students teachers' use of ICT by areas of specialization (Arts, Sciences and Social Sciences). The result shows that there is no significant difference in student teachers use of ICT by areas of specialization (F-cal= 0.451, df = 638; p> 0.05). This indicates that there is no significant difference among Arts, Sciences and Social Sciences student teachers in their use of ICT. Therefore, hypothesis two which states that there is no significant difference among Arts, Sciences and Social Sciences student-teachers on their use of ICT was upheld. This means that student teachers' areas of specialization did not influence their level of ICT use.

11.0   DISCUSSION OF FINDINGS

The finding on the level of ICT usage among student teachers as sought by research question one indicated that student-teachers in the North-Central zone of Nigeria were average in level of ICT usage (2.35(58.75%) (see table 4.2). This finding disagrees with earlier findings of Waite (2004) who concluded that although student teachers in schools show great interest in ICT, in practice the use of ICT is relatively low.

This finding disagrees with earlier findings of Gadio (2001) who pointed out that the earlier curfew hours for girls in hostels constrained their access to ICT use. Ikolo (2010) stated that the gender digital divide is manifested in the low number of female users if ICTs compared to men. This disagrees with the finding in hypothesis two.

The results of the test of hypothesis two in table 2.0 revealed that the area of specialization of the student teachers had no influence on their ICT use since no significant difference was found in the level of ICT use of student-teachers in the Sciences, Arts, and Social Sciences. This agrees with the study conducted by Olumorin (2008), who found out that there was no significant difference in the use of computer by student teachers in tertiary institutions based on their areas of specialization. This corroborates the fact that all areas of specialization require extensive use of ICT.

12.0   LIMITATIONS OF THE STUDY

The following are the limitations of the study:

iThe data collection would have been conducted over a longer period but due to limited time and fund, it was done in only thirteen weeks.

ii The sample used was drawn from eight universities in North Central Nigeria. Therefore, the results and conclusions were restricted to eight universities in North Central Nigeria from where the sample was drawn.

13.0   CONCLUSIONS

The average level of ICT use by student-teachers in North-Central Nigeria corresponds with their average literacy level. ICT use is a factor of access. There is a high tendency that level of ICT use would have been higher if access was greater.

Similarly, gender had no influence on the student teachers' access to ICT as no significant difference was found in the level of ICT use of male and female student teachers.

14.0   RECOMMENDATIONS

Based on the findings of the study, the following recommendations are put forward:

There is need to improve the access of the student teachers to ICT in order to improve their level of use, especially since they have an average literacy level. Hence more ICT equipment should be made available to the students by the various universities.

REFERENCES

Adam, A. (1999). *Artificial knowing: Gender and the thinking machine.* London: Routledge.

Agboola, A. K. (2006). *Assessing the awareness and perception of academic staff in using e-learning tool for instructional delivery in a post-secondary institution*: A case study. The Innovation Journal The Public Section Innovation Journal, 11(7), 23-26.

Angel, D. (2008). Humanizing education through technology. *Engineering Education,*60, 118-120.

Awodeji, B. A. (2007). *Planning human resource development*. Ibadan: Heine mann.

Badru, J. (2002). *An inquiry into the uses of instructional technology*. Enugu: Godspower Printers Ltd.

Bruce, R. (1998). Knowledge and innovation system", In OECD, *Knowledge management in the learning society*, Paris.

Chaverz, C. (1997). Student take flight with Daedalus: Leaning Spanish in a networked classroom. *Foreign Language Annals,* 3(1), 27-37.

Dede, C. (1998). *Futures: Images of educational technology in the next millennium*. Tallahassee, FL: Florida Educational Technology Conference

Ewhrudjakpor, L. A. (2006). Designing hypermedia systems for instruction. *Journal of Educational Technology Systems 12(19),* 14- 29.

Ezenwa, V.I. (2005). Concept mapping: A veritable tool in science education. The seventh inaugural lecture series of the Federal University of Technology, Minna.

Gambari, A.I. (2010). The development of computer aided instruction on learning of integrated science. *Journal of Research in Communication and Teaching. 1(1).*

Ibrahim, I.K. (2010). *Effects of local resources on learning achievement and retention among secondary school biology students. Unpublished M.Tech Thesis, Federal University of Technology Minna, Niger State.*

Mannel, N. (1996). *Nattering on the Net: Women, power and cyberspace.* Melbourne: Spinfex.

Moyo, H. (1996). Organizing and managing campus information and communication technologies: Teacher Education in the information technology. Abuja: NCCE.

Nsofor, C.C. (2006). Assessing the effects of designed instructional model on students' performance in science. 2nd School of Science and Science Education Conference Proceedings, Federal University of Technology, Minna. 391-398.

Oyelaran-Oyeyinka, B; & Lai, K. (2006). *SMEs and new technologies, learning, e-business and development.* London: Palgrave Publishers.

Remayah, O. (2003). Social dimensions of information technology: Issue for the New Millennium. London: IDP.

Tinio, R. (2003). Voices of the poor. Can anyone hear us? Oxford University Press Today, 2(3), 2-4.

Tomei, L. (2005). Concentration and infusion: Two approaches for teaching technology for life long learning. T.H.E. Journal, 26(9), 73-76.

Yaki, A.A. (2011). Effects of computer animation and guided inquiry on secondary school students' learning outcomes in ecological concepts.

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