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GENDER, ACADEMIC QUALIFICATION AND SUBJECT DISCIPLINE DIFFERENTIALS OF NIGERIAN TEACHERS' ICT LITERACY LEVEL

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ABSTRACT

This study x-rayed the level of ICT literacy as influenced by gehder, academic qualification and subject-discipline among public secondary school teachers in Ogun-State, Nigeria. 364 (129 males and 235 females) teachers constituted the sample of this study. The sample has a Mean Age of 35.7 and Standard Deviation of 9.51. Teachers' Computer Ability Scale (TCAS) with cronbach coefficient alpha of 0.83 was used for the collection of the data that was analysed with t-test and Analysis of Variance. The study revealed that academic qualification and gender have no influence on the secondary school teachers' level of ICT literacy, while teacher's level of ICT literacy was found to be subject-discipline determined. It was recommended amongst other things that ministries of education should sensitize all teachers on the relevance of ICT to improved and quality education. Furthermore, government was also encouraged to motivate and sponsor teachers for ICT skills' acquisition training.

Key words: Gender, Academic Qualifications, ICT literacy, Teachers.

Introduction

The world is seemingly experiencing a third wave of social and technological transformation as the society is becoming more oriented to the Information and

Communication Technology (ICT). ICT is one of the various factors that are drastically influencing occupational success especially in the education sector. Adamu (2004) sees ICT as "a set of technological tools and resources used to communicate and create, disseminate, to store and manage information". The information dissemination is easily possible through computer technologies. Markauskaite (2006) opines that "the introduction of computer technology into teaching and learning is a giant stride towards improving the quality of education". Globally in the recent time, a new type of literacy that is more widely discussed is computer literacy. In fact, ICT (computer) literacy has been a subject of educational research ever since the integration of technology into education system either as tools for self-study or as a teaching device.

Zeszotarski (2000) describes ICT literacy as the ability to use e-mail, graphical interfaces such as Netscape, online publishing and the ability to evaluate the content of online materials. Throwing more light on the concept, Idowu, Adagunodo and Idowu (2004) view computer literacy as the ability to use computer system to word-process document, analyse data, develop small computer programmes, browse Internet and install software. To Owen (1996), ICT literacy goes beyond the aforementioned, apart from the basic knowledge and understanding computers, he further highlighted computer literacy skills to include being

- comfortable with the installation and configuration of common software.
- familiar with and making use of computer modem regularly.
- able to access a computer bulletin board or online service.
- able to send and receive messages via electronic mail
- able to upload and download computer files with ease
- to print from the computer.

The necessity for a working familiarity with computer is becoming important because of the value placed on it by employers of labour. In the labour market, personnel with adequate knowledge, skills and confidence in computer usage seem to have rising hope. Merritt, Smith and Di-Renzo (2005) emphasizes that even in education industry, high level of teacher's computer literacy is a contributing factor to scholastic performance in schools.

In developed countries, high level of ICT literacy has been recorded relatively among teachers but Idowu, Adagunodo and Idowu (2004) noted that Nigerian teachers are lagging behind. Obono,(1998) as cited in Aduwae-Ogiegbaen & Isah, (2005) further

observes that less than one thousandth Nigerians are computer literate, and the Nigerians slow uptake of Information and Communication Technology (ICT) accounts for this. The level of teacher's ICT literacy is an important variable in educational setting. Satharasinghe (2006) alerts that the excitement and benefits computer offers to teaching and learning is inestimable. ICT in education system has become a significant indices of national development, an instrument of individual empowerment and a key to opportunities to succeed in life (Rogers & Morell, 2001). Computer illiterate secondary school teachers will find it difficult to offer the right and quality education demanded by the information age of 21st century to their students. Such teachers will also deny the students' access to skills needed for higher education, white-collar jobs, chances to compete with students from schools with more technology-oriented teachers and the privilege to be self-dependent, self-sufficient and be professionally competent (Adejoh & Ojzoji, 2005).

Researches on the potency of teachers' level of computers literacy in teaching and learning reveal that ICT: facilitates students' better learning and serves as a motivator to students that have been disillusioned with education (Butler & Mautz, 1996; Cox,1999; Liao, 1998; Rampp & Guffrey 1998); and also makes learning more flexible (Audu, 2004). Furthermore, ICT enhances easy and convenient teaching (Aduwae-Ogiegbaen & Isah, 2005); sparks students' interest and promotes holistic, collaborative and integrated learning(Dellit, 2002; Levis & Thurston, 1996); promotes the quality of curriculum content delivery (Leisle, Gary& Daniel, 2002) and makes learning students'-centered (Akinde & Adagunodo,2001). In spite of the huge benefits of teachers' high level of computer literacy in instructional process, some teachers are still negatively disposed towards acquiring computer skills let alone integrating it into curriculum process because they lack patience and experience, thus they become frustrated. In addition, many teachers have been found to lack adequate technical information and communication skills that will enable them use computer in relation to pedagogical practices (Corl, 1996 as cited in Zeszotarski 1996; Hakkaraineu, Mnukoneu, Lipponen, Liomaki, Rahikainen, and Lehtinen, 2001). Meanwhile, Olalere (2005) reiterates the contribution of teachers' self-concept and self- efficacy as part of the factors that determine their level of their computer literacy.

Heemskerk and Kuiper (2005) as cited in Markauskaite (2006) reported that boys are intensive users of the Internet because they believe that they possess the ability to accomplish with machines. ICT related gender inequalities concern not only students but also educators. Hayne, (1999) as cited in Olalere (2005) also notes that a large number of male teachers are not seriously concerned about the integration of ICT into

the instructional process. In fact, the crop of teachers in most schools lack the required knowledge, techniques and professional capabilities to harness computer technologies into teaching and learning (Babalola, Ibitoye, & Efunbajo, 2002).

In Nigeria, the Federal Ministry of Education with an intention of improving the quality of education and facilitating national development set up a committee in 1988 to ensure the democratization of computer literacy at the national level. One of the recommendations of that committee was that computer literacy should be introduced to teachers and students at all levels of education system (Idowu, Adagunodo & Idowu, 2004; Gupta & Hassan, 2002). Since then, both the Federal and State governments in Nigeria have called for increased teachers training in computer technology in order to provide their students the needed tools required in meeting the challenges of academic activities. Kadiri (2002) emphasizes the importance of ICT to national development, its applications into almost every facet of life such as Media establishment, Medicine, Banking, Agriculture, Law, Armed forces, Sports including Education industry just to mention a few. Success in these fields is now strongly attached to computer utilization. This study therefore sorts to determine the level of computer literacy of public secondary school teachers as influenced by gender, academic qualification and subject discipline.

Hypotheses

The following hypotheses were raised for this study:

1. Public secondary school teachers' ICT literacy level will not be significantly different based on gender.
2. Public secondary school teachers' ICT literacy level will not be significantly different based on academic qualifications.
3. Public secondary school teachers' ICT literacy level will not be significantly different based on subject areas.

Methodology

Design

The research design for this study was a survey design. This design is considered appropriate by the researcher because its aim is to provide quantitative or numeric description of some fraction of a sample selected from the population by asking

relevant questions that address some unknown aspects of the population; and this is the main objective of the present study.

Sample

A total of 364 teachers (129 males and 235 females) with Mean Age of 35.7 and Standard Deviation of 9.51 were disproportionately selected through simple random sampling from public secondary schools in 8 (40%) out of 20 Local Government Areas in Ogun State, Nigeria . Amongst the respondents, 122 (33.5%) (Mean = 19.41, SD = 12.00) were holders of Nigerian Certificate in Education (NCE), 218 (59.8%) (Mean = 21.40, SD = 11.64) were holders of Bachelors degree, 24 (6.59%) (Mean = 17.50, SD = 7.38) were holders of Master degree, while 116 (31.9 %) (Mean =19.06, SD- 13.51) were Science teachers, 75 (20.6 %) (Mean = 19.04, SD = 10.25) were in Arts/Humanities, and 173 (47.5 %) (Mean = 22.05, SD = 11.57) were Commercial subject teachers.

Instrumentation

The instrument used for this study was the Teachers' Computer Ability Scale (TCAS) developed by the Researcher. The instrument has two sections. Section A contains the demographic data of the respondents, while section B contains 26 items on computer literacy skills. Respondents were to indicate their degree of agreement with each item on a four-point likert type scale ranging from 1 (Often) to 4 (I don't know). The instrument was given to two computer science lecturers, and a psychometrician to ascertain its validity. The comments of each of these experts were considered in the production of the final draft of the instrument. The scale has a test-retest reliability coefficient of 0.83.

Procedure

To administer the instrument, four Research Assistants were trained on how to effectively administer the instrument. The researcher and the research assistants sought for the permission of each of the school principals before the commencement of the administration of the instrument. Meanwhile, teachers of varying subjects' areas were approached as respondents to the instruments. The copies of the administered survey were collected the same day of administartaion, while some were collected at later given dates.

Results

Table 1: Descriptive results of respondents' ICT literacy level

	N	Range	Min	Max	Mean	Std	Variance	Skewness		kurtosis	
								Statistics	Std error	Statistics	Std error
ICT Literacy	364	43	1	44	20.485	11.57	134.074	0.23	.128	-1.092	.255

Results in Table 1 indicated that the distribution of the scores is positively skewed, revealing that respondents are more close to the minimum scores (1) than the higher scores (44). The range (43) and the kurtosis (-1.092) are indicative that the distribution is platykurtic. This in effect shows that most of the respondents are scoring below the mean score with not much deviation between the scores.

Table 2: t-test statistical difference of literacy level between male and female teachers

Group	N	Mean	δ	df	t-cal	t-cri	P	Remarks
Male	129	21.92	12.42	362	1.76	1.96	>.05	Accepted
Female	235	19.69	11.03					

The results in Table 2 clearly indicated that there exist no significant difference in the ICT literacy level between the male and female secondary school teachers as the calculated value of 1.76 is less than the table value of 1.96. Therefore, the hypothesis, which states that, there will be no significant difference in the level of ICT literacy between the male and female secondary school teachers, was thus accepted. This implies that gender has no influence on the level of ICT literacy of secondary school teachers.

Table 3: Descriptive statistics of teachers by academic qualification.

Group	N	Mean	Std deviation	Std Error
NCE/OND	122	19.4180	12.00953	1.08729
BSC/BA/B.ED	218	21.4083	11.64464	.78867
M.A/M.Sc/M.ED	24	17.5000	7.38388	1.50723
TOTAL	364	20.4835	11.57904	.60691

The results in Table 3 indicated the mean and the standard deviation of the Nigerian public secondary school teachers. Amongst the teachers, M.A/M.Sc/M.ED (Mean = 17.5000, SD = 7.38388), Bachelor's degree holders (Mean 21.4083, SD = 11.64464),

Nigerian Certificate in Education (NCE) /Ordinary National Diploma (OND) holders (Mean =19.4180, SD = 12.00953). It is clear that, comparatively the ICT literacy level of the bachelor's degree holders among the teachers was significantly higher than their counterparts with Masters' degree who had the lowest ICT literacy level. It is however observed that the proportion of Nigerian secondary school teachers with Masters degree is significantly low (24) when compared with their counterparts with Bachelor degree (218).

Table 4: Analysis of variance of ICT literacy level of secondary school teachers based on academic qualification.

	Sum of squares	df	Mean square	F	sig
Contrast	538.556	2	269.278	2.020	.134
Error	48130.345	361	133.325		
Total	48668.901	363			

The results in Table 4 revealed that there exists no significant difference in ICT literacy level of Nigerian public secondary school teachers based on their highest academic qualification. This is so because the f-ratio of 2.020 was found significantly lower than the critical f-Ratio of 3.00 at 0.05 level of critical confidence. Consequently, the hypothesis which states that there is no significant difference in the level of ICT literacy of public secondary school teachers with different academic qualifications was accepted. This implies that academic qualification has nothing to do with the ICT literacy level of Nigerian teachers in public secondary schools.

Table 5: Descriptive statistics of teachers by subject discipline.

	N	Mean	Std Deviation	Std Error
Science	116	19.0690	13.51246	1.25460
Arts/Humanities	75	19.0400	10.25017	1.18359
Commercial	173	22.0578	10.53218	.80075
Total	364	20.4835	11.57904	.60691

Table 5 above, the indicated the mean and the standard deviation of Nigerian public secondary school teachers based on their subject area. However, it is evidently clear that amongst the teachers, Commercial subject teachers (Mean = 22.0578, SD = 10.53218), Art/Humanities subject teachers had the highest (Mean 19.0400, SD = 13.51296). This is followed by Science subject teachers (Mean = 19.0690, SD = 13.51246). and Arts / Humanities subject teachers (Mean = 19.0400; SD = 13.51296).

Table 6: Analysis of variance of ICT literacy level of teachers based on subject area.

	Sum of squares	df	Mean square	F	Sig
Contract	817.151	2	408.575	3.082	
Error	47851.750	361	132.553		<.05
Total	48668.901	363			

The results in Table 6 revealed that there is a significant difference in the ICT literacy level among the public secondary school teachers based on their subject areas. This is because the f-ratio 3.082 was found to be slightly higher than the f-ratio 3.00 at 0.05 level of significance. Therefore, the hypothesis, which states that there will be no significant difference in the level of ICT literacy of public secondary school teachers in different subject areas was rejected. This implies that teachers' ICT literacy level was influence by subject discipline.

Discussion

The study explored a survey of the influence of gender, academic qualification, and subject area on ICT literacy level of public secondary school teachers in Ogun-State, Nigeria. Emanating from the findings of this study is that, the ICT literacy level of the teachers was not gender specific. From all indications by the outcome of this study, teachers irrespective of their gender have been found to embrace the use of ICT devices for personal, academic or instructional purposes. This outcome is in consonance with the finding of Olalere (2005) who reports that male and female secondary school teachers have similar degree of ICT competence and proficiency. This finding on the contrary is at variance with previous research outcomes that noted gender as a strong determining factor to teachers' computer literacy (Arnez & Lee, 1990 as cited in Smith & Necessary 1996; Reinen & Plomp, 1993; Smith & Necessary, 1996; Volman, 1997; Sharpka & Ferrari, 2003; Idowu, Adagunodo & Idowu, 2004; Francis & Katz, 1996; Imhof, Vollmeyer, Beierlein, 2007).

It was evident from this study that teachers' ICT literacy level was not academic qualification specific. The results show no mutual supportive relationship between the ICT literacy level of teachers and the varying academic qualification attained or earned by the various teachers who participated in this study. One conclusion to be drawn from this finding is that teachers responses to acquiring knowledge, skills and competence in the manipulation of Information and Communication Technology is on the high rise without academic qualification prejudice. However, this outcome is

incompatible with the finding of Atkins and Vasu (2000) and (Equity Resource Center, 2000) which reported discrepancies in teachers technology literacy level in view of their degree or level of educational attainment, because the attitudes of teachers towards the acquisition of computer literacy skills and usage depreciate as they attain higher academic qualifications.

The results of this study further show the disparity in the ICT literacy level of teachers of varying subject areas. It is quite surprising to find that commercial subject- teachers were found to have higher level of literacy than their counterparts, because, one would have ordinarily expected the science teachers to much more inclined to and posses higher ICT literacy level. The report presented by Oludipe (2004) lends credence to this research outcome because she found that there exists a low level of acquaintances with many computer packages among Science teachers. In a similar direction with the outcome of this study, Thomas and Martz (2006) reported that there is a considerable difference in computer literacy level of teachers based on their subject discipline.

Conclusion

In the age of global technology advancement, teachers in developing nations such as Nigeria are still fraught to realize the facilitating potential impact of technology in education, hence the realization of their low level of ICT literacy. However, teachers' gender disparity in technology acceptability and usage in developing nation is dramatically fading-off because of the alloyed relationship that exist between students academic success and computer knowledge, experience, use and competency that are directly influenced by teachers' computer factors. Meanwhile, as Information and Communication Technology is having its way into education and eating deep into the curriculum pedagogy, there is the need for secondary school teachers including those in humanities, Arts and Commercial subjects to realize the need to have positive disposition to the use of technology for instructional purposes. Teachers irrespective of subject discipline deserve to seize and maximize the opportunity of the wide array of technological devices available across the globe to improve the standard of instruction in schools.

Recommendations

If developing nations like Nigeria is to make meaningful achievement economically, socially, politically and educationally, teachers of all subjects must come to the realization that the traditional face-to-face mode of instruction should be enhanced

with various Information and Communication Technologies. It is therefore suggested that the various Ministries of Education should carry out awareness and enlightenment campaigns to sensitize and motivate all teachers irrespective of subject areas to see the need and the relevance of ICT literacy to effective teaching and learning in schools. Where affordable, the various levels of government and Ministries of Education should sponsor teachers of varying areas of specialization for ICT training and workshop on regular basis so as to boost their level of literacy in Information and Communication Technology and its use in instructional process.

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