Revitalizing Nigerian Education in Digital Age: What most of the papers in this book have in common is the concern for the revitalization of Nigerian education in the digital age through ICT and other modern methods of making education functional and effective in the new modernity. While some of the chapters deal with conceptual issues, others consider the various role of education in this digital age and how Nigeria can be relevant. Most of the chapters present well researched, detailed and informative papers on how to reposition Nigerian education in the digital age. Specifically, the role of education in bringing Nigeria's new world about are discussed in simple language and then taken up in different forms all through the book. Since Nigeria has to act fast and decisively to be on the same development and education wavelength as the other members of today's global family, serious actions are being suggested in this book. *Revitalizing Nigerian Education in Digital Age* simply means taking the above desiderata seriously. Nigeria has a daunting task in view of the heavy education burden. This is the message that this book puts across.

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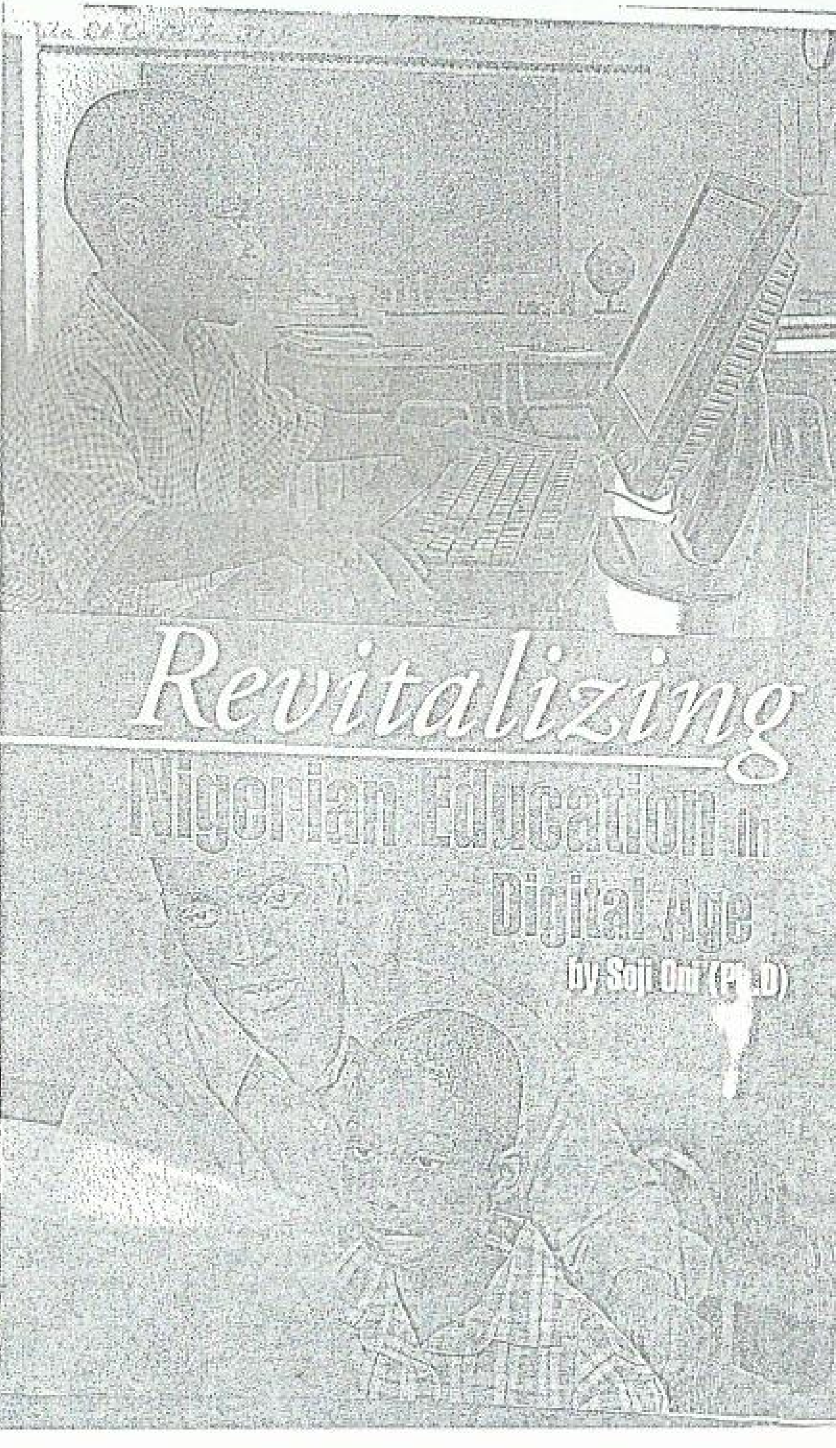

Revitalizing Nigerian Education in Digital Age

by Soji Oni (Ph.D)

Revitalizing
Nigerian Education in Digital Age

Soji Oni (Ph.D)

Assessment of Computer Literacy of Public School Teachers in Lagos State: Implications for Millennium Development Goals

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and
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Introduction

The quest for eradication of illiteracy in modern societies is a basic concern of every society in the world. This is due to the fact that education is one of the vital indices used in the categorization of nations as developed or developing (Yusuf et al., 2009). Lack of basic education is a silent killer of large number of poorest children in the developing world. For any country to be categorised as a developed nation, she must get rid of illiteracy among the citizens by ensuring that every member of the society has access to education.

Education is an important key for the development of any society; it is an instrument a society can use to solve her problems. Education is an essential tool through which human and natural resources are harnessed for the common good of humanity.

According to UN (2001), the Millennium Development Goals (MDGs) are eight international development goals that all 189 United Nations member states and some other international organisations have agreed to achieve by the year 2015. The aims of MDGs which were officially established at the Millennium Summit on September 8, 2000, where all world leaders present adopted the United Nations Millennium Declaration, are to encourage development by improving social and economic conditions in the world's

poorest countries. These eight time-bound goals provide concrete, numerical benchmarks for tackling extreme poverty in its many dimensions. They include goals and targets on income, poverty, illiteracy, hunger, maternal and child mortality, disease, inadequate shelter, gender inequality, environmental degradation, and the Global Partnership for Development.

Two MDGs relate to education; these are goal 2 (MDG2) targeted at achieving universal primary education and goal 3 (MDG3) focusing on promoting gender equality and empower women. Information and Communication Technologies (ICTs) have impacted greatly on teaching, learning, research, and school management in a number of ways. ICTs are electronic technologies used for accessing, processing, gathering, manipulating, and presenting or communicating information (Yusuf, 2007). ICTs are often associated with high-tech devices, such as computers and software, but ICT also encompasses more "conventional" technologies such as radio, television, and telephone technology. Computer literacy is the ability to use computers and access and create information through a computer (UNESCO, 2006).

ICT can be used as a tool for acquisition of literacy skills. The use of computers in education can enhance the uptake of literacy skills; computer programs when used bring about the benefit of meeting the learner's needs and interests. While ICT cannot be substitutes for teachers, it can supplement and support teachers by reducing their workload and enhancing their lessons. MDGs have pivotal belief that a child who is educated is more empowered to escape from poverty. The achievement of MDG2 depends on national investments in education that are used wisely and efficiently. These include the provision of skilled and motivated teachers, adequate teaching materials, and school infrastructure. Computer literacy level is nowadays paramount in determining the sense of professional responsibility of teachers.

Most efforts by government in addressing the issue of technological deficiency in the educational system have all always been targeted at the students with little or no attention paid to teachers who are to pass these instructions (Champion, September 8, 2010). However, the successful integration of computer into classroom will depend on the ability of teachers to structure the learning environment in non-traditional ways, to merge new technology with new pedagogy, to develop socially active classrooms which encourage cooperative interaction, collaborative learning, and group work. The study examines the implication of computer literacy level of

teachers on success...
Island local government area of Lagos State.

Research Questions

The study addresses the following questions.

1. What proportion of public school teachers in Lagos Island Local government area is computer literate?
2. What proportion of public school teachers in Lagos Island Local government area owns computer machine?
3. To what extent will computer literacy of teachers help in achieving universal basic education by 2015?
4. What are the available computer resources in public schools?
5. What is the relationship between computer literacy of teachers and the achievement of MDGs?

Hypotheses

The following hypotheses shall be tested in this study:

1. Null hypothesis (H0): There will be no significant relationship between public school teachers' computer literacy level and their gender.
   Alternate hypothesis (H_1): Public school teachers' computer literacy level will be significantly influenced by gender.
2. Null hypothesis (H0): There will be no significant relationship between public school teachers' computer literacy level and their subject area.
   Alternate hypothesis (H_1): Public school teachers' computer literacy level will be significantly influenced by their subject areas.
3. Null hypothesis (H0): There will be no significant relationship between public school teachers' computer literacy level and their type of school.
   Alternate hypothesis (H_1): Public school teachers' computer literacy level will be significantly influenced by type of school.
4. Null hypothesis (H0): There will be no significant relationship between public school teachers' computer literacy level and their years of experience.
   Alternate hypothesis (H_1): Public school teachers' computer literacy level will be significantly influenced by years of experience.

Millennium Development Goals

Education is a central function of any nation or community and as such, according to UNESCO (2008), it addresses a diversity of purposes and goals which include inculcating core values and passing on cultural legacy; supporting personal development of young people and adults; promoting democracy and increasing participation in society particularly among females and minorities; encouraging cross-cultural understanding and the peaceful resolution of conflict, improving health, and well-being; and supporting economic development, reducing poverty, and increasing widespread prosperity.

United Nations Educational, Scientific and Cultural Organisation; UNESCO (2005a), cited by UNESCO (2008), submitted that the education programmes of the United Nations (UN) and UNESCO address the aforementioned purposes and goals; MDGs, Education for all (EFA), the United Nations Literacy Decade (UNLD), and the Decade of Education for Sustainable Development (DESD) aim to reduce poverty and improve health and the quality of life and view education as an important contribution to these goals. All these programmes aim to increase the equality of women and men and advance the human rights of all, particularly minorities; they also believe that education is a key to development, as a way of enabling people to fulfil their potential and take increasing control over decisions that affect them. All see education as a right of all citizens.

The United Nations' second and third MDGs are achieving universal primary education and promoting gender equality, respectively. The MDGs in education are defined in terms of participation and completion of primary education by all children and the elimination of gender discrimination in education (Gutterman et al., 2009).

Concepts of Literacy and Computer Literacy

Literacy has traditionally been described as the ability to read and write. It is a concept claimed and defined by a range of different theoretical fields. UNESCO (2006) reported that the initial simple definition adopted by UNESCO's General Conference in 1958 of a literate person was "one who can read and write, with understanding, a short simple statement about his or her everyday life". Having realised that literacy campaigns must be

more than a mere acquisition ...
into account the context and motivations of learners, UNESCO's General Conference in 1978 gave the term "functional literacy" recognition. It defined a functional literate person as "one who can engage in all those activities in which literacy is required for the effective functioning of his (or her) group and community and also for enabling him (or her) to continue to use reading, writing and calculations for his own and the community's development" (UNESCO, 2005b).

The concept of literacy is nowadays viewed as a plural notion. There is general belief that people acquire and apply literacy for different purposes in different situations, and that literacy is not uniform, but is culturally and linguistically diverse. UNESCO (2005b) recognised that skills for written expression and comprehension are related to particular contexts and languages and that the value of these skills lies in the ability to apply them in a beneficial way.

Today, the definition of literacy has been expanded; many now consider literacy to be the ability to locate, evaluate, use, and communicate using a wide range of resources including text, visual, audio, and video sources (Information Age Inquiry, n.d.). Also, UNESCO (2006) affirmed that the word "literacy" is often used today as a substitute for the word "ability" or "competency". Examples of such uses of the word "literacy" according to UNESCO (2006) included the legal literacy (the knowledge of basic legal rights and how to protect those rights), computer literacy (the ability to use computers, and access and create information through a computer), etc.

Hence, being able to read, write, and calculate in today's complex world is often not enough, development in technology are changing what it means to be a literate person.

Information and Communication Technologies plays an important role in reaching the educational MDGs. Its ability to transcend time and space allows learning to take place 24 hours a day, 7 days a week. However, Wagner and Kozma (2005) in UNESCO (2006) affirmed that as the use of ICT grows, it is important for people to also develop the skills required to utilise these technologies effectively and productively. They conclude that beyond the traditional skills needed to read and write, information retrieval and management, and critical thinking and problem-solving skills

formal education system.

Globally in the recent time, a new type of literacy that is more widely discussed is computer literacy. UNESCO (2006) described *computer literacy* as the ability to use computers and access and create information through a computer. With the increase in access to the Internet, Zeszotarisk (2000) in Onasanya., Shehu, Ogunlade., & Adefuye (2011), expanded definitions of computer literacy to include the ability to use e-mail, graphical interfaces such as Netscape, online publishing, and the ability to evaluate the content of online materials. Apart from the basic knowledge and understanding computers, Agbatogun (2010) highlighted computer literacy skills to include being comfortable with the installation and configuration of common software, familiarity with and making use of computer modem regularly, ability to access a computer bulletin board or online service, ability to send and receive messages via electronic mail, ability to upload and download computer files with ease, and ability to print from the computer.

Impact of Globalization on Teaching and Learning

Globalization can be defined in many ways. In its simplest form, it can be seen as "the increasing connectedness of societies' (Macionis and Plummer, 2008, p. 42). The impacts of this connectedness are wide ranging and visible in health, security, culture, education, politics, and finance (Cohen and Kennedy, 2000; Giddens, 2007). The use of computer in teaching is a relevant and functional way of providing education to learners in order to assist them imbibing the required capacity for the world of work. Aladejana (2007), cited by Kosoko-Oyedeko and Tella (2010), concluded that very few jobs today do not require the use of skills in technology, collaboration, and teamwork; all of which can be acquired through teaching with ICTs which is fundamentally changing the way we live, learn, and work.

Globalization is a revolution that involves the use of computers, Internet, and other telecommunication technology in every aspect of human endeavour. The field of education has certainly been affected by the penetrating influence of ICT worldwide; it has made remarkable impact on the quality and quantity of teaching, learning, and researching in educational institutions. ICT has the potential to accelerate, enrich, and deepen skill; to motivate and engage students in learning; to help relate

school experiences to work practices; to help tomorrow's workers, contribute to radical changes in school; to strengthen teaching; and to provide opportunities for connection between the school and the world (Ajayi and Ekundayo, 2009).

Computer is increasingly playing an important role in organisations and in society's ability to produce, access, adopt, and apply information. Stressing the importance of the use of computer in schools, Olorunsola (2007) in Ajayi and Ekundayo (2009) concluded that through computer, educational needs have been met. It changes the needs of education as well as the potential processes; message can be communicated through the electronic mail (e-mail), telex, or telephones, particularly the mobile ones.

ICT is an indispensable part of educational administration as its application makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' pedagogical activities. An instance is the teaching online programmes via web-based systems make e-learning popular means of using ICT to provide education to students both on and off campus (ibid). The role of education in nation building and the population explosion in Nigerian secondary schools have made the use of ICT in the teaching-learning process unavoidable. Its adoption by teachers will enhance effective teaching. Issues like good course organisation, effective class management, content creation, self-assessment, self-study, collaborative learning, task-oriented activities, and effective communication between the actors of teaching-learning process and research activities will be enhanced by the use of ICT-based technology (Ajayi and Ekundayo, 2009).

Teaching and learning have gone beyond the teacher standing in front of a group of students and disseminating information to them without the students' adequate participation; with the aid of computer, teachers can ensure the adequate participation of learners in teaching-learning process and create vital environments to experiment and explore (Ajayi, 2008). This new development is a strong indication that the era of teachers without computer skills are gone. Any classroom teacher with adequate and professional skills in computer utilisation will definitely have his students performing better in classroom learning. Goal three of the MDGs has the specific target to "eliminate gender disparity in primary and secondary education preferably by 2005 and all levels of education no later than 2015". ICT promote gender equality by providing online opportunities

traditional role as homemaker and mother can inhibit her ability to attend school. In some countries, social customs make it difficult for women to participate in activities that involve mixing with men. In some cases, female school enrolment begins to reduce at child-bearing age due to pressure to marry and have children. Through applications like distance education, ICT can help overcome these barriers (Abudullahi, 2009 in Onasanya., Shehu, Ogunlade., & Adefuye (2011).).

Computer Application in Nigerian School Systems: Government Policies and Status

In 1988, The Nigeria government enacted a policy on computer education. The plan was to establish pilot schools and diffuse computer education innovation first to all secondary schools and then to primary schools. Unfortunately, the project did not really take off beyond the distribution and installation of personal computers (Okebukola, 1997; cited by Adomi and Kpangban, 2010).

The Federal Government of Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2004), recognised the prominent role of ICT in the modern world and has integrated ICT into education in Nigeria. To actualise this goal, the document states that government will provide basic infrastructure and training at the primary school. At the junior secondary school, computer education has been made a pre-vocational elective and is a vocational elective at the Senior Secondary School.

Although efforts have been made to ensure that ICT is available and used in Nigerian public schools, the level of uptake is still low as typical public school provides neither opportunity nor training in using ICT, and about 75% of teachers have no or very limited experience and expertise regarding ICT education applications (Adomi and Kpangban, 2010).

Furthermore, Yusuf and Yusuf (2009) found out that there is wide gap between the 1988 Nigerian Government's policy on computer education and its implementation. They reveal that most secondary school teachers were not competent in basic computer operation and the use of generic software. Several reasons adduced for the lack of success in the implementation of past reforms include inconsistency in government policy and lack of political will to effect lasting solutions to educational problems, lack of

required personnel resulting from lack of training [illegible]
are designed, inadequate funding, top-down approach to the development of educational reforms, lack of proper monitoring, overemphasis on paper qualification instead of placing such on productive marketable skills, and so on (ibid).

A cursory look at the secondary schools in Nigeria has shown that many teachers in the system still rely much on the traditional "chalk-and-talk" method of teaching rather than embracing the use of ICT (Ajayi and Ekundayo, 2009). Okebukola (1997) remarked that computer is not part of classroom technology in over 90% of public schools in Nigeria, thus the chalkboard and textbooks continue to dominate classroom activities. These reports are indications that students and their teachers are still lagging behind in the trend of changes in the world, and hence, their denial of the opportunities which ICT offers in the teaching-learning activities. There is the need to replace the traditional pedagogical practices that still dominate the educational system in the country, hence the need for the application of computer in particular and ICT in general in Nigerian schools.

Barriers to Computer Literacy in Nigerian Schools

The United Nations Development Programme, UNDP's Human Development Report (2003), indicated that "there are a number of barriers to achieving the MDG target of all children receiving primary school education. One of the most pervasive is the shortage of facilities and teachers, often due to financial constraints".

The low rate of ICT adoption and application in Nigeria public schools is generally attributable to several barriers. According to Yusuf (2007), these obstacles have been identified to be technical, non-technical, human and organisational, and financial.

Technical obstacles include the poor telecommunication infrastructure, problem of connectivity, lack of (or limited) bandwidth for ICT for learning, teaching, and research, non-reliability of public electricity supply, thus necessitating extra cost for standby generators.

The non-technical obstacles deal with lack of professional development for faculty. Human and organisation aspect relates to inadequate planning for ICT integration in regular activities of schools, and inadequate human

ICT infrastructure acquisition, maintenance of available facilities, and staff development.

Furthermore, Yusuf (2007) highlighted barriers to ICT application and awareness to include the lack of teacher's confidence and teacher's computer anxiety, for instance, some teachers believe that computer is meant for yahoo-yahoo boys who use it to chat and defraud. Other hindrances are lack of teacher's competency due to lack of time for training, lack of pedagogical training, lack of skills training, and lack of ICT focus in initial teacher training. According to him, there is lack of access to resources due to lack of hardware, poor organization of resources, poor quality hardware, inappropriate software, and lack of personal access for teachers; the absence of ICT equipment in most Nigerian schools leads teachers to resort to cybercafe for Internet access. In addition, there is lack of time to use computer as a result of school time table (BECTA, 2004, cited in Yusuf, 2005).

Other obstacles identified by Yusuf (2007) as causes of low computer literacy among teachers include ineffective technological leadership in schools, lack of clear vision, lack of incentives for teachers, and lack of teachers' participation in planning for ICT integration.

Methodology

The study adopted the descriptive research design. This design is relevant as well as all variables of interest in the study have already existed and the researchers only examined and described them as they manifest. This implies that there was no form of manipulation of any of variables involved.

The population of this study comprises of public school teachers in Lagos Island Local Government Area of Lagos state. Two hundred (200) participants were selected as the sample size for the purpose of this study scattered across eight public schools in the Lagos Island local government area.

The research instrument was the questionnaire for teachers made by the researcher to evaluate the implication of public school teachers' computer literacy level on the achievement of educational MDGs in Lagos Island Local Government Area of Lagos state. The questionnaire was made up of three sections A, B, and C. Section A captures the respondent's

personal data information. Section B comprises of twelve (12) [illegible] questions carefully designed to evaluate the respondent's perception of the relationship among computer literacy level of public school teachers, teaching profession, and the achievement of the educational MDGs. Section C captures necessary information to evaluate the computer literacy level of the respondent and the computer resources availability level in the public schools.

Section B was designed on four-point Likert scale, seeking the respondent's feeling to each particular items which was one of "strongly disagree," "disagree," "agree," and "strongly agree" (correspondingly rated 1 to 4). Likert scale used for the questionnaire (1-4) serves as a self-coding for any response given. Respondents were simply required to tick the appropriate column indicating their feelings.

Both face validity and content validity of the questionnaire are examined by expert judges. The Cronbach's Alpha (α) reliability coefficient calculated by consulted analyst was 0.80. The questionnaire was also administered on some number of the study sample twice, two weeks apart ("test-retest"); the computed value for the test-retest correlation coefficient was 0.80.

Data collected were analysed using both descriptive and inferential statistics. Descriptive statistics of percentages mean and standard deviation and inferential statistics of chi-square were employed to provide answers to the research questions and to test the hypotheses at 0.05 level of significant.

Results

Research Question 1: Computer Literacy Proportion of Public School Teachers

Computer literacy level of respondents are determined using questionnaire items that capture the respondents' frequency of computer usage, number of computer basic operations capable of performing (out of seven provided), and experience in using computer resources for teaching and learning. These are items 6-8 of section C of the questionnaire; while items 6 and 8 are rated based on 5-point Likert scale (1-5); ability to perform any basic operation (out of seven provided) in item 7 attracts 1 point each. Each respondent's scores in items 6-8 are added together, a 50% of the score (totalling 17) classifies the particular as a computer literate teacher.

Table 1: Distribution of respondents by computer literacy

Computer literacy	No. of respondents (*f*)	Percentage (100*f*/*n*) %
Yes	87	43.50
No	113	56.50
Total	200	100.00

Table 1 indicates that 87 (or 43.5%) of public school teachers are computer literate, while 113 (or 56.5%) are not computer literate. This unencouraging status of computer literacy level among public school teachers may definitely have a negative implication on the successful realization of educational MDGs within the few available years of grace to the target date. Nevertheless, an improvement in computer literacy level of public school teachers and provision of necessary ICT facilities in schools will correspondingly help in the achievement of Universal Basic Education (UBE) by the target year of 2015. This will manifest in an increase in interaction and socialization among students; strengthening of teaching and connections; and effective teaching, management, and assessment.

Research Question 2: Computer Machine Ownership Proportion of Public School Teachers

Computer machine ownership proportion of respondents are determined using item 5 of section C of the questionnaire.

Table 2. Distribution of respondents by computer ownership

Computer ownership	No. of respondents (*f*)	Percentage (100*f*/*n*) %
Yes	70	35.00
No	130	65.00
Total	200	100.00

As shown in Table 2, only 70 respondents representing 35% of the public school teachers have access to computers in their homes, while 130 participants (65%) do not personally have access to computers in their homes and conveniences.

Research Question 3: How Teachers' Computer Literacy Will Help in Achieving UBE by 2015

Table 3. How teachers' computer literacy will help in achieving UBE by 2015

Response	Increase interaction and socialization among students		Strengthen teaching and connections		Effective teaching, management and assessment		Helps to achieve UBE by 2015	
	No. of respondents (*f*)	Percentage (100*f*/*n*) %	No. of respondents (*f*)	Percentage (100*f*/*n*) %	No. of respondents (*f*)	Percentage (100*f*/*n*) %	No. of respondents (*f*)	Percentage (100*f*/*n*) %
Strongly disagree	7	3.5	1	0.5	6	3.0	4	2.0
Disagree	21	10.5	14	7.0	14	7.0	25	12.5
Agree	111	55.5	86	43.0	142	71.0	90	45.0
Strongly agree	61	30.5	99	49.5	38	19.0	81	40.5
Total frequency	200	100.0	200	100.0	200	100.0	200	100.0

As shown in Table 3, 111 respondents representing 55.5% of the public school teachers agree that computers will help to increase interaction and socialization among students in the classroom; 61 (30.5%) strongly agrees, 21 (10.5%) disagrees, while 7 (3.5%) strongly disagrees with that statement. The mean of the item is 3.13, and the standard deviation (σ) is 0.73. This in effect shows that most of the respondents agree with the statement that computers will assists in achieving UBE by 2015 by bringing about increase in interaction and socialization among students in the classroom; there is not much deviation among respondents' views.

In the same vein, 1 (0.5%), 14 (7%), 86 (43%), and 99 (49.5%), respectively, strongly disagree, disagree, agree, and strongly agree with the statement that "computer literacy strengthens teaching and provides opportunities for connection between the school and the world". The mean of this item is 3.4; the standard deviation (σ) is 0.64. This result shows that most respondents agree with the statement with not much deviation among respondents' views.

Research Question 4: Available Computer Resources in Public Schools

One of the factors influencing computer literacy of teachers is the availability of computer, human, and material resources in schools. Availability of these resources is determined using items 1, 2, 3, and 4 of section C of the questionnaire.

Item 1 captures the number of computer systems in respondents' schools; item 2 gets the count of computer subject teachers in those schools; item 3 accepts the practical computer literacy level of those computer subject teachers; item 4 determines the availability of computer laboratory in respondents' schools.

Table 4. Distribution of respondents by computer systems in schools

No. of computer	No. of respondents (*f*)	Percentage (100*f*/*n*) %
None	138	69.00
(1-5)	56	28.00
(6-10)	6	3.00
Above 10	0	0.00
Total	200	100.00

The result in table 4 shows that majority of public schools are without computer system facilities. The mean of this response is 1.34; the standard deviation (σ) is 0.53.

Majority (47.5%) proportion of respondents has no computer subject teacher in their schools; 71 (35.5%) has only 1 computer teacher; 32 (16%) has between 2 and 5 computer subject teachers; only 2 respondents have above 5 subject teachers in their schools. Table 5 illustrates these facts. The mean of the item is 1.7, and the standard deviation (σ) is 0.77.

Table 5. Distribution of respondents by computer subject teachers in schools

Compute r subject teachers	No. of respondents (*f*)	Percentage (100*f*/*n*) %
None	95	47.50
1	71	35.50
2-5	32	16.00
Above 5	2	1.00
Total	200	100.00

Most respondents reported that their schools either lack supply of computer subject teachers or they are inexperienced where they exist. See Table 6.

Table 6. Distribution [illegible] subject teachers

Practical -knowledge of computer teachers	No. of respondents (*f*)	Percentage (100*f*/*n*) %
Not at all	104	52.00
Little	37	18.50
Average	27	13.50
Much	27	13.50
Very much	5	2.50
Total	200	100.00

With respect to existence of functional computer laboratories in public schools, Table 7 shows that only 16 (8%) has the facility, while a major proportion comprising 184 respondents (92%) are without computer laboratories.

Table 7. Distribution of computer laboratory in public schools

Computer literacy	No. of respondents (*f*)	Percentage (100*f*/*n*) %
Yes	16	8.00
No	184	92.00
Total	200	100.00

Research Question 5: The Relationship between Computer Literacy of Teachers and the Achievement of MDGs

Public school teachers have various personal perceptions of influences computer literacy has over effective performance of teaching services and achievement of MDGs. The conception is decided using items 1, 2, 3, 4, 6, and 8 of section B of the questionnaire.

Item 1 captures the perception of the respondent with respect to threatening of job if computer is applied in teaching service; item 2 expresses respondent's view on how computer improves learning by students. Item 3 shows whether all topics in respondent's subject could be taught with the aid of computer or not; item 4 determines the position of the teacher with respect to the ability of teacher to cover more work when computer is used; item 6 finds out perception of teachers regarding importance and necessity of computers in teaching. Lastly, item 8 accepts the respondent's view regarding the fact that teachers must be computer literate these days to be relevant in teaching services.

Table 8. The relationship between computer literacy of teachers and the achievement of MDGs

Response	Computer in teaching will not threaten the job of teachers		Computers can greatly improve learning by students		All topics in my subject area can be taught with computer		Teacher covers a lot of work within short time with computer		Computers are very important and necessary in teaching		Teachers must be computer literate to be relevant in teaching services	
	No. of respondents (f)	Percentage (100/fn) %	No. of respondents (f)	Percentage (100/fn) %	No. of respondents (f)	Percentage (100/fn) %	No. of respondents (f)	Percentage (100/fn) %	No. of respondents (f)	Percentage (100/fn) %	No. of respondents (f)	Percentage (100/fn) %
Strongly disagree	7	3.5	2	1.0	10	5.0	2	1.0	2	1.0	2	1.0
Disagree	29	14.5	5	2.5	79	39.5	25	12.5	11	5.5	12	6.0
Agree	123	61.5	124	62.0	82	41.0	121	60.5	133	66.5	100	50.0
Strongly agree	41	20.5	69	34.5	29	14.5	52	26.0	54	27.0	86	43.0
Total frequency	200	100.0	200	100.0	200	100.0	200	100.0	200	100.0	200	100.0

As shown in Table 8, 184 respondents [illegible] school teachers sampled either agreed or strongly agreed that application of computer in teaching will not threaten the jobs of teachers; 29 respondents (14.5%) disagreed with this view while only 7 respondents (3.5%) strongly disagreed that computer in teaching will not threaten the jobs of teachers. The mean of this response is 2.99. The standard deviation (σ) is 0.70. This result shows that majority of public school teachers agree that application of computer in teaching will not threaten the jobs of teachers.

In a similar pattern, a majority of 193 respondents representing 96.5% support the view that computers can greatly improve learning by students. The mean of this response is 3.3. The standard deviation (σ) is 0.57.

With respect to the possibility of using computer to teach all topics in teachers' subject areas with computer, a fair majority of 111 (55.5%) respondents confirm that all topics of their various subject areas are teachable with computer. The mean of this response is 2.65. The standard deviation (σ) is 0.79.

From the same Table 8, majority of teachers sampled support the view that teachers cover a lot of work in short time when computers are used (173 or 86.5% respondents); that computers are very important and necessary in teaching (187 or 93.5% respondents); and that teachers must be computer literate to be relevant in teaching services (186 or 93% respondents).

This outcome revealed that computers can greatly improve learning by students. The report presented by Kosoko-Oyedeko and Tella (2010) lends credence to this research outcome as they found that teachers generally have the perception that ICT contributes to pupils' performance. The research established that computer application is necessary in teaching and that computer literacy on part of teachers is essential to their relevancy in teaching services. Meanwhile, the research shows that an increase in level of computer literacy of public school teachers when matched up with the provision of required ICT infrastructure in schools will assist in the achievement of educational MDGs by the target date of 2015 in Nigeria.

Hypothesis 1: Relationship between Public School Teachers' Computer Literacy Level and their Gender

Table 9 shows the descriptive analysis of computer literacy capabilities of respondents by gender. While 37 male participants are computer literate, 38 are not. Also, 50 female are computer literate, 75 are non-literate.

Table 9. Public school teachers' computer literacy level by gender (observed frequencies)

	Gender (f_o)		
Computer literacy	Male	Female	Total
Yes	37	50	87
No	38	75	113
Total	75	125	200

Using chi-square statistical method, the expected frequencies table (f_e) is as follow

Table 10. Public school teachers' computer literacy level by gender (expected frequencies)

	Gender (f_e)		
Computer literacy	Male	Female	Total
Yes	32.6	54.4	87
No	42.4	70.6	113
Total	75	125	200

$f_e - f_o$	$(f_e - f_o)^2$	$[(f_e - f_o)^2] / f_e$
-4.4	19.36	0.593865031
4.4	19.36	0.456603774
4.4	19.36	0.355882353
-4.4	19.36	0.274220963

The computed value of ...

The degree of freedom is calculated as the product of the number of rows in the table minus 1 and the number of columns in the table minus 1.

Degree of Freedom (df) = (2–1) × (2–1) = 1.

From normal distribution for chi-square in the chi-square distribution table; the chi-square value in the table at alpha (α) level (p =.05) and degree of freedom (df = 1) is 3.84.

The computed value of chi-square (1.68) is lesser than the value in the table for p =.05 and df =1 (chi-square = 3.84). Therefore, we accept the null hypothesis (with a 5% probability of error) and reject the alternate hypothesis. Hence, *there is no significant relationship between public school teachers' computer literacy level and their gender.*

By the outcome of this hypothesis testing, teachers, irrespective of their gender, have been found to embrace the use of computer and other ICT devices for personal, academic, or instructional purposes. This outcome is in consonance with the finding of Agbatogun (2010) who reported that male and female public school teachers have similar degree of ICT competence and proficiency. Gender is a very important factor to reckon with in the twenty-first century because it is one of the issues of globalization where the whole world is trying to erase the issue of gender inequality by clamouring for gender equality. This is reflected in the outcome of this study, women have the same perception of issues and literacy level just like their men counterpart.

Hypothesis 2: Relationship between Public School Teachers' Computer Literacy Level and their Subject Areas

Table 11 shows the descriptive analysis of computer literacy capabilities of respondents in relation to their subject areas (discipline). Out of 87 computer literate participants in the study, 30 are science teachers, 29 teach arts and humanities subjects, and 28 teachers handle commercial subjects. The 113 non-computer literate teachers comprise 55 arts and humanities, 35 science, and 23 commercial teachers, respectively.

Table 11. Public school teachers' computer literacy level by subject area (observed frequencies)

Computer literacy	Subject area (f_o) Arts/ humanities	Science	Commercial	Total
Yes	29	30	28	87
No	55	35	23	113
Total	84	65	51	200

Using chi-square statistical method, the expected frequencies table (f_e) is as follows:

Table 12. Public School Teachers' Computer Literacy Level by subject area (Expected Frequencies)

Computer Literacy	Subject Area (f_e) Arts/Humanities	Science	Commercial	Total
Yes	36.5	28.3	22.2	87
No	47.5	36.7	28.8	113
Total	84	65	51	200

$f_e - f_o$	$(f_e - f_o)^2$	$[(f_e - f_o)^2]/f_e$
7.5	56.25	1.54109589
-7.5	56.25	1.184210526
-1.7	2.89	0.102120141
1.7	2.89	0.078746594
-5.8	33.64	1.515315315
5.8	33.64	1.168055556

The computed value of chi-square = 5.59.

The degree of freedom is calculated as the product of the number of rows in the table minus 1 and the number of columns in the table minus 1.

Degree of Freedom (df) = (2 - 1) × (3-1) = 2

From normal distribution for chi-square in the chi-square distribution table, the chi-square value in the table at alpha (α) level (p =.05) and degree of freedom (df = 2) is 5.99.

The computed value of chi-square (5.59) is lesser than the value in the table for p =.05 and df = 2 (chi-square= 5.99). Therefore, we accept the null hypothesis (with a 5% probability of error) and reject the alternate hypothesis. Hence, *there is no significant relationship between public school teachers' computer literacy level and their subject areas.*

It was thus evident that teachers' computer literacy level was not subject area specific. The results show no mutual supportive relationship between the computer literacy level of teachers and their various subject areas. This finding is at variance with previous research outcome of Agbatogun (2010) which noted subject areas as a strong determining factor to teachers' computer literacy level.

Hypothesis 3: Relationship between Public School Teachers' Computer Literacy Level and their Type of School

Table 13 shows the descriptive analysis of computer literacy capabilities of respondents in relation to their type of school. Out of 87 computer literate participants in the study, 16 are engaged in primary school, 35 are in Junior Secondary School (JSS), and 36 teachers are engaged in the Senior Secondary School (SSS). The 113 non-computer literate teachers comprise 12 primary, 61 JSS, and 40 SSS teachers, respectively.

Table 13. Public school teachers' computer literacy level by type of school (observed frequencies)

Computer literacy	Type of school (f_o) PRY	JSS	SSS	Total
Yes	16	35	36	87
No	12	61	40	113
Total	28	96	76	200

Using chi-square statistical method, the expected frequencies table (f_e) is as follows:

(expected frequencies)

Computer literacy	Type of school (f_e) PRY	JSS	SSS	Total
Yes	12.18	41.76	33.06	87
No	15.82	54.24	42.94	113
Total	28	96	76	200

$f_e - f_o$	$(f_e - f)^2$	$[(f_e - f_o)^2]/f_e$
-3.82	14.5924	1.198062397
3.82	14.5924	0.922402023
6.76	45.6976	1.094291188
-6.76	45.6976	0.842507375
-2.94	8.6436	0.261451906
2.94	8.6436	0.20129483

The computed value of chi-square = 4.52.

The degree of freedom is calculated as the product of the number of rows in the table minus 1 and the number of columns in the table minus 1.

Degree of Freedom (df) = (2–1) × (3–1) = 2

From normal distribution for chi-square in the chi-square distribution table, the chi-square value in the table at alpha (α) level (p =.05) and degree of freedom (df = 2) is 5.99.

The computed value of chi-square (5.59) is lesser than the value in the table for p =.05 and df = 2 (chi-square = 5.99). Therefore, we accept the null hypothesis (with a 5% probability of error) and reject the alternate hypothesis. Hence, *there is no significant relationship between public school teachers' computer literacy level and their type of school.*

This result shows that there is no established pattern of association between the computer literacy level of public school teachers and the type of schools where they teach. As we are having computer literate

also are computer non-literate teachers exist in those types of schools.

Hypothesis 4: Relationship between Public School Teachers' Computer Literacy Level and their years of Experience

Majority (56) of computer literate participants in the study are having maximum of 8 years of teaching experience, 22 literate teachers have between 9 and 16 years, 3 have between 17 and 24 years of teaching experience, 4 computer literate participants have between 25 and 32 years of experience, while only 2 computer literate teachers have at least 33 years of teaching experience. Table 15 shows the descriptive analysis of computer literacy capabilities of respondents in relation to their years of experience.

Table 15. Public school teachers'. computer literacy level by years of experience (observed frequencies)

Computer literacy	Years of experience (f_o) (8 and below)	(9-16)	(17-24)	(25-32)	(33 and above)	Total
Yes	56	22	3	4	2	87
No	56	36	9	12	0	113
Total	112	58	12	16	2	200

Using chi-square statistical method, the expected frequencies table (f_e) is as follows:

Table 4.20. Public school teachers' computer literacy level by years of experience (expected frequencies)

Computer literacy	Years of experience (f_e) (8 and below)	(9-16)	(17-24)	(25-32)	(33 and above)	Total
Yes	48.72	25.23	5.22	6.96	0.87	87
No	63.28	32.77	6.78	9.04	1.13	113
Total	112	58	12	16	2	200

$f_e - f_o$	$(f_e - f_o)^2$	$[(f_e - f_o)^2]/f_e$
-7.28	52.9984	1.087816092
7.28	52.9984	0.837522124
3.23	10.4329	0.413511692
-3.23	10.4329	0.318367409
2.22	4.9284	0.944137931
-2.22	4.9284	0.726902655
2.96	8.7616	1.258850575
-2.96	8.7616	0.96920354
-1.13	1.2769	1.467701149
1.13	1.2769	1.13

The computed value of chi-square = 9.154

The degree of freedom is calculated as the product of the number of rows in the table minus 1 and the number of columns in the table minus 1.

Degree of Freedom (df) = (2–1) × (5–1) = 4

From normal distribution for chi-square in the chi-square distribution table, the chi-square value in the table at alpha (α) level (p =.05) and degree of freedom (df = 4) is 9.49.

The computed value of chi-square (9.154) is lesser than the value in the table for p =.05 and df = 4 (chi-square = 9.49). Therefore, we accept the null hypothesis (with a 5% probability of error) and reject the alternate hypothesis. Hence, *there is no significant relationship between public school teachers' computer literacy level and their years of experience.*

This outcome shows that teachers' computer literacy level was not years of experience specific. Distribution of computer literacy among public school teachers is not proportionally connected to the years of teaching experience.

Conclusion

The study showed that the actual computer usage and basic computer operational experience among public school teachers are slightly below average and thus more efforts need to be undertaken by teachers to improve on their knowledge and usage of computers. These efforts should also include teachers personally [illegible] system as well as taking their own initiative to acquire knowledge and skills pertaining to computer technology.

The moment the public school teachers realise that the usage of computer makes the lesson interesting, exciting, and easier to teach, they would perceive its usefulness and job relevance. There is need for attitudinal change of these teachers to accept the fact that teaching with computer is contemporary and teaching the old style will make them archaic. The benefits from the actual usage of computer must be realised as compatible and manageable.

The low level of awareness and knowledge-ability of educational application of ICT (Computer and Internet) in teaching public school in this technological information age could be attributed to the reasons such as non-availability of facilities and equipment to facilitate computer education; lack of funds (finance) to procure equipment; hot climatic condition; irregular power supply, and teacher incompetence (Onasanya et al., 2011).

Teachers therefore should be trained to be computer literates for efficient utilization of ICT facilities. This would also enhance the level of Nigeria's involvement and participation in this fast emerging electronic global world.

Recommendations

Based on the finding of this survey, the following recommendations are advanced in order to uplift the computer literacy of public school teachers in Nigeria and thereby make educational MDGs realizable.

Focus should be on training of teachers and instructors to use ICT to develop their own teaching support materials. Teachers should be trained on the use of ICT resources for teaching and learning particularly, the use of different software packages, CDs, CD ROMs, videotapes on concepts and processes. This approach assures ownership by teachers and instructors and enhances the usability of products.

Teachers should be provided with adequate and appropriate support in their classrooms and be guided by professional standards that incorporate a code of conduct.

by government, companies, religious groups, Non-Governmental Organizations (NGOs), social organizations, Parent Teacher Associations, etc. However, any initiative, be it from government, private sector, or civil society, should make lobbying for more investments in computers a priority. Insufficient access to computers is one of the main obstacles in ICT for education programmes.

Efforts should be made by Ministry of Education (at Federal and state levels) to post computer skilled teachers to each school to impart computer skills to students.

Computer literacy programme should be provided for both pre-service and in-service teachers and full integration of ICT resources into Teacher Education Programme at teacher preparatory level should be ensured.

The government should establish and fund computer education research and development centres in each state of the federation, equipped with necessary facilities or equipment and train manpower to produce software for computer and general education. This will foster easy access to ICT materials.

The federal government should link all public schools to the global telecommunications network (Internet) to enable teachers and students benefit from instructional materials, videoconferencing, resources sharing, distance learning, and other services available on the Internet. The government should also ensure regular supply of electricity in schools.

Government cooperation is necessary for ICT programme to be sustainable. Its cooperation is needed in order to support the education curriculum system, which is vital for the survival of actual computer usage in education. Government has to consider the social context of the country in the attempt to re-evaluate the education curriculum of the country.

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