INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) NEEDS OF SECONDARY SCHOOL TEACHERS IN DELTA STATE: A CASE FOR HUMAN CAPITAL DEVELOPMENT

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ABSTRACT

This study determined the ICT needs of secondary school teachers in Delta State. The descriptive survey design was adopted. A total number of three hundred and sixty four (364) teachers randomly selected from thirty five secondary schools from the three (3) Senatorial Districts of Delta State were used for the study. A self-constructed questionnaire "Information and Communication Needs of Teachers' Questionnaire" (ICT-NOTQ) with a reliability index of 0.76 was used to obtain data for the study. The t-test statistical analysis was used to analyze the data collected and the results revealed that most teachers in Delta State have not been adequately trained in the use of ICT in classroom. It was also discovered that most schools in Delta State do not have computers for instructional purposes. The schools are not also connected to the sources of power supply. In the light of the above, it was recommended that the government should ensure the retraining of all serving teachers to make them ICT compliant. Also adequate ICT facilities should be provided in all the post-primary educational institutions.
Keywords: *Teachers, Secondary school, Human Capital Development, ICT*

INTRODUCTION

Recent publications by educational associations are advocating for a more meaningful use of technology in schools. Educational technologists are clearly describing what students should know and be able to do with technology. They are advocating integrating computer skills into the content areas, proclaiming that computer skills should not be taught in isolation and that separate computer classes do not really help students learn to apply computer skills in meaningful ways. Indeed the need for teachers who are computer literate has long been recognised (Geisert & Futrell, 1984). Individual teachers need specific competences to deal with specific classroom situations. Despite a lack of consensus on the nature of computer literacy, educators have produced defec to definitions through programme development. In the classroom, a computer may serve a teacher as a medium of instruction, as a means of managing instruction (for example, grade book, diagnostic testing, lesson prescription) and in various other ways for example in producing worksheets, maintaining data files, amongst others.

Dalton and Giacoletto (1992) define Information Technology (IT) as the systematic study of artefacts that can be used to give form or description to facts in order to provide meaning or support for decision making, and artefacts that can be

used for the organisation, processing, communication and application of information. Sansanwal, (2000) defines ICT as the use of hardware and software for efficient management of information, that is, storage, retrieval, processing communication, diffusion and sharing of information for social, economical and cultural upliftment. There are a good number of examples of information technology which include personal computers as well as new forms of telephone, televisions and various hand-held devices for sending and receiving of information or messages (Okorodudu, 2010).

In the Nigerian school context today, teaching concentrates on giving information which is not the sole objective of teaching. Along with giving information, the other objectives according to Sansanwal (2009), include: (a) developing understanding and application of concepts, (b) developing expression power, (c) development of judgement and decision-making ability; (d) developing reasoning and thinking ability, (e) improving comprehension, speed and vocabulary (f) developing self concept and value clarification; (g) developing proper study habits, (h) developing tolerance and risk-taking capacity, scientific temper, amongst others. He observes that with the present infrastructures, class size, availability of teachers, quality of teachers, training of teachers, amongst other factors, it is difficult to achieve all the objectives. Indeed he says that not a single teacher is capable of giving up-to-date and complete information in his subject. This is where ICT comes to fill the gap because it can provide correct information as comprehensive as possible in different forms with different examples.

ICT can enhance the quality of education in several ways by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, by enhancing teacher training (Haddad & Jurich, 2002). Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy in the 21st century (Bransford, 1999). When used appropriately, ICTs - especially computers and internet technologies enable new ways of teaching and learning. These new ways of teaching and learning constitute a shift from a teacher-centered pedagogy to one that is learner-centered. There have also been studies that seem to support the claim that the use of computers enhances and amplifies existing curricula. According to Fouls (2002) students learn when they work with computers.

An issue to be considered in ICT use in education is the question of access. According to Tandon (1998), women have less access to ICTs and fewer opportunities, for ICT-related training compared to men because of illiteracy and lack of education, lack of time, lack of mobility and poverty. Mark (2010) further states that boys are more likely than girls to have a access to computers in school and at home. Not surprisingly, boys tend to enjoy working with computers more than girls. Girls are also said to be disadvantaged because of domestic chore responsibilities. Another issue or concern is the sustainability of ICT-enhanced educational programmes. This, according to Cisler (2002) entails four (4) components - social, political, technological

and economic. For instance, economic sustainability refers to the ability of school and community to finance ICT-related programme over the long run while technological concerns focus on cost and availability of spare parts. Finally, on concern issues, one basic requirement on ICT use in instruction is the availability of electricity. It was observed by Hawkins (2002) that in developing countries (Nigeria inclusive), large areas are still without a reliable supply of electricity.

The main purpose of this study, therefore, was to access the information and communication needs of Nigerian secondary school teachers. Specifically the study examined the level of ICT knowledge and use among secondary school teachers in Delta State of Nigeria; examined teachers' attitude to ICT use in classroom instruction; determined the ICT needs of male and female secondary school teachers in Delta State, Nigeria; assessed if any differences existed in the ICT needs of experienced and un-experienced secondary school teachers in Delta State; and the also examined the differences in ICT needs of public and private secondary schools in Delta State. In achieving the above, the study addressed such questions as:

1) What is the mean rating of ICT knowledge and use of secondary school teachers in Delta State?
2) What are the mean ratings of male and female secondary school teachers towards ICT use in classroom instruction?
3) How do the ICT needs of experienced and inexperienced teachers differ in secondary schools in Delta State?
4) How do the ICT needs of public and private schools in Delta State differ?

In response, the following research hypotheses were formulated.

Ho₁: There is no significant difference between the ICT needs of public and private secondary school teachers in Delta State.

Ho₂: There is no significant difference in the ICT needs of male and female secondary school teachers in Delta State.

Ho₃: There is no significant difference between the ICT needs of in experienced and experienced secondary school teachers in Delta State.

CHALLENGES FOR HUMAN CAPITAL DEVELOPMENT

It is a well-known fact that the contribution of education to economic growth and development occurs through its ability to increase the productivity of existing labour force in various ways (Babalola, 2003). Human capital, according to Olaniyan and Okemankinde (2008) represents the investment people make in themselves that enhance their economic productivity. OCED (1998) explains human capital to mean "the knowledge, skills and competencies and other attributes embodied in individuals that are relevant to economic activity". Since no nation can rise above the quality of its teachers (FRN, 2004); various competencies must be developed throughout the educational system for ICT integration to be successful. Teacher professional development should according to MacDougall & Squires (1997) have five (5) foci:

(1) skills with particular applications, (2) integration into existing curricula, (3) curricular changes related to the use of IT (including changes in instructional design), (4) changes in teacher role, and (5) underpinning educational theories. Ideally, these should be addressed in pre-service teacher training and built on and enhanced in in-service. All factors put together, it is right to say that ICT use in schools will raise the standard of education in Nigeria. It is an idea whose time has come. How it is being implemented in Nigeria is the focus of this study. Do secondary school teachers in Nigeria posses the requisite ICT skills and knowledge to cope with this pedagogical innovation? Do they posses the desired attitudinal disposition towards computer-assisted instruction? Indeed are the needed ICT infrastructures available in the required quality and quantity in our schools? These are the puzzles that form the thrust of this investigation.

METHODOLOGY

This study employed the descriptive survey method. The sample consisted of 364 secondary school teachers drawn from thirty-five public and private schools in the three Senatorial Districts of Delta State. In all, eighty four (84) private and 280 public secondary school teachers were used for the study. The stratified random sampling technique was employed to obtain the subjects of the study. 176 female and 188 male teachers were sampled. Comparability was also established by using the criteria of length of service of sampled teachers.

One expert each in Test and Measurement from the Faculty of Education, Delta State University, Abraka and College of Education, Agbor were used to validate the self-constructed questionnaire. The Information and Communication Needs of Teachers Questionnaire (ICT-NOTQ), made up of 25 items was divided into two sections. Section A dealt with respondents' biodata while section B focused on the level of ICT knowledge, attitude and ICT needs of secondary school teachers. The instrument was based on a four-point scale of Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (D) 2 points and Strongly Disagree (SD) 1 point. To ascertain its reliability, the instrument was pre-tested on a trial sample of thirty (30) teachers outside the schools originally selected for the study. A split-half reliability index $r = 0.76$ was obtained. The value was considered high enough for the study.

For the administration of the questionnaire, the researcher personally visited the twelve (12) schools selected in Delta North senatorial district while well-instructed (trained) assistants were engaged in collecting data from the remaining twenty three (23) schools drawn from Delta South and Delta Central senatorial districts of the state.

RESULTS AND DISCUSSION

Table 1: Respondents' Mean Ratings on Level ICT Knowledge

Items	N	SA	A	D	SD	Mean	StD	Dec.
I have been adequately trained to use the computer.	364	64	100	96	104	2.34	1.08	Disagree
Sometimes I browse for information in my subject area.	364	80	144	84	56	2.68	0.99	Agree
I have a functional email address.	364	100	104	72	88	2.59	1.14	Agree
I can type documents using the computer.	364	120	96	60	88	2.68	1.17	Agree
I sometimes use some educative TV programs to teach my students.	364	64	84	88	128	2.23	1.12	Disagree
ICT has improved my pedagogical skills.	364	52	140	92	80	2.45	0.99	Disagree
Summated Mean						14.97	6.49	

Source: Survey 2011. StD = Standard Deviation, Dec. = Decision

Table 1, based on mean benchmark of 2.50 shows the responses of the subjects on the level of ICT knowledge and use. The data revealed that respondents agree that they sometimes browse for information in their subject matter area; most have functional E-mail addresses; and can operate the computer. They, however, disagreed that they have been adequately trained to use the computer; sometimes use some educative T.V. programmes to teach students; and that ICT has improved their pedagogical skills. Thus it can be deduced that a lot has to be done in the area of human capital development of secondary school teachers.

Table 2: Respondents' Mean Ratings on Attitude to ICT Sub Scale

Item	N	SA	A	D	SD	Mean	StD	Dec.
It is rather too late to acquire computer literacy.	364	12	20	108	224	1.51	0.75	isagree
Computer literacy is for the younger generation.	364	8	16	68	272	1.34	0.67	Disagree
I experience anxiety when I operate computer.	364	16	96	156	96	2.09	0.84	Disagree
I can teach effectively without knowledge of IT	364	48	176	104	36	2.65	0.83	Agree
ICT is a good idea in our educational system.	364	236	120	0	8	3.60	0.61	Agree
I am interested in acquiring computer skills	364	240	116	4	4	3.63	0.57	Agree
Summated Mean						14.82	4.27	

Source: Survey 2011   StD = Standard Deviation, Dec. = Decision

Table 2 shows respondents' mean ratings on attitude to ICT use in classroom instruction. Respondents disagreed that it is too late to acquire computer literacy. They also disagreed that computer literacy is for the younger generation. Similarly, they disagreed that they experience some anxiety while attempting to operate the computer. Most subjects agree, however, that they can teach without the knowledge of information technology; that ICT is a welcome innovation in our school system; and that they are highly interested in acquiring skills in computer operation.

Table 3: Respondents' Mean Ratings on ICT Needs of Teachers

Item	N	SA	A	D	SD	Mean	StD	Dec.
My school has enough computers	364	48	32	48	236	1.70	1.09	Disagree
My school has a computer operator who handles all result compilation	364	32	32	64	236	1.62	0.97	Disagree

We have audio-visual room	364	16	32	56	260	1.46	0.83	Disagree
We are connected to the internet	364	24	36	52	252	1.54	0.92	Disagree
The State Government assisted us to acquire personal computers.	364	12	20	64	268	1.38	0.74	Disagree
School documents are in flash drivers/video	364	16	52	68	228	1.60	0.89	Disagree
My school enjoys steady power supply	364	12	28	56	268	1.41	0.77	Disagree
We have a standby generating plant	364	48	64	48	204	1.88	1.12	Disagree
DELSUBEB organizes periodic workshops and seminars on ICT for teachers	364	16	92	76	180	1.85	0.95	Disagree
There is usually prompt repairs of broken down computers and TV sets in my school.	364	32	36	60	236	1.63	0.98	Disagree
Summated Mean						43.09	13.28	

Source: Survey 2011.   StD = Standard Deviation, Dec. = Decision

The table above shows that all the respondents disagreed that they have the needed ICT facilities in their schools. For instance, all the respondents do not have enough computers for use in their schools; no computer operators; no audio visual rooms; their schools are not connected to internet and the national power supply; amongst others. The data were further analysed using measures of central tendency (mean), measure of dispersal (SD) and t-test statistics.

Table 4: t-test Statistics in Public and Private Secondary School Teachers ICT Needs

Item	N	Mean	SD	Df	t-calculated	Critical Value	Remark
Public	280	2.03	0.667	83			
Private	84	2.26	0.742	279	14.313	1.960	Rejected

The table 4 above shows that the mean and standard deviation of private schools are higher than that of the public schools. The calculated t-value of 14.313 is higher than the critical or table value of 1.960. Since the calculated t - is more than the critical value, the hypothesis which states that there is no significant difference between the ICT needs of public and private secondary school teachers in Delta State is rejected at 0.05 level of significance. It was concluded therefore that there was significant difference in the ICT needs of secondary school teachers based on proprietorship.

Table 5: Gender Difference in ICT Needs of Secondary School Teachers

Item	N	Mean	SD	Df	t-cal	t-Crit	Remark
Male	188	2.08	0.646	187			
					14.294	1.960	Rejected
Female	176	2.28	0.710	175			

The result on table 5 shows that the calculated t-value of 14.294 is more than the critical or table value of 1.960. This suggests a significant sex difference in the ICT needs of male and female students.

Ho₃: There is no significant difference between the ICT needs of less experienced and more experienced secondary school teachers in Delta State.

Table 6: Needs of Experienced and Less Experienced Secondary School Teachers

Item	N	Mean	SD	Df	t-cal	t-Crit	Rm
Less experienced (1-5/6-10 yrs)	236	2.16	0.747	236			
					23.795	1.960	Rejected
More experienced (11-16 yrs)	128	2.90	0.382	127			

The results displayed on table 6 indicate that the mean scores of 2.16 and 2.90 for less experienced and more experienced teachers respectively is significantly different (t = 23.795, p = 0.5). This implies that there is significant difference in the teachers' years of experience and their ICT needs. Hence the hypothesis is rejected. The result of data analysis showed that teachers in Delta State have not been adequately trained in ICT use. Thus the paradigmatic shift in both content and pedagogy which is the hallmark of the 21st century education reform may not be easily realised in Delta State (Bransford, 1997). The study also revealed the positive disposition of secondary school teachers in Delta State towards the acquisition of ICT knowledge and skills. If teachers are therefore given the needed infrastructure and training, the quality of education will surely improve. The study showed the appalling situation of ICT facilities in schools in Delta State. The schools do not have electricity supply or standby generator plants. This finding is consistent with the observation of Hawkins (2002) that large areas of developing countries lack reliable supply of electricity. Other facilities that are not available in the school system as revealed by the study are computer laboratories, internet services, amongst others. This situation certainly spells doom for the much desired ICT revolution in the state.

The finding from hypothesis one above showed that there was difference in the ICT needs of public and private secondary school teachers. Contrary to expectation, the private secondary school teachers experience higher needs for ICT. The occasional workshops and seminars being organised by the relevant organs of government and few pieces of computers distributed to state schools may have made some sampled teachers to believe that they are "ICT compliant". On the other hand, apart from the very negligible "elite" private schools that have some of these facilities, most private secondary schools are grossly ill-equipped with even the basic science laboratories let alone ICT accessories. Hence the teachers in these mushroom private schools feel strongly the need for ICT in classroom instruction.

Hypothesis two showed a sex difference in the ICT needs of secondary school teachers in Delta State. The fact that girls express higher desire for ICT training is supported by Tandon (1998) and Mark (2010). They believe that men or boys have more access to computers than women or girls. Girls were said to be disadvantaged because of domestic chore responsibilities and other factors. Also the results of this study showed difference in ICT needs of less-experienced and experienced secondary school teachers in Delta State. The less-experienced teachers who appear chronologically younger seemed to have some basic knowledge of ICT at school from where they recently graduated. The older and more-experienced teachers left

school before the emphasis on information and communication technology. Hence, they expressed ICT needs more than their younger and less-experienced colleagues.

CONCLUSION AND RECOMMENDATIONS

Since it is generally upheld that no nation can rise above the quality of its teachers, the need for teachers who are computer-literate should be recognised by all tiers of government. Therefore, a deliberate and consistent effort should be made to train serving and trainer teachers on ICT as it relates to classroom instruction. Indeed all teachers should be "ICT compliant" This is one sure way of ensuring improvement in the productivity of existing labour force in the educational industry. Also, as part of requirements for employment and registration of intending teachers, evidence of proficiency in ICT should be shown. The gap between policy formulation and policy implementation should be bridged. To avoid the pitfall of the ill-fated and now jettisoned 6-3-3-4 education system, adequate ICT infrastructures must be put in place in all post-primary institutions. Since energy or electricity supply is a sine qua non for effective utilization of information and communication technology, effort should be made to connect all secondary schools to the source of power supply in the state. Infact, deliberate effort should be made to solve the problem of epileptic power supply in the state.

Government should also ensure that teachers are supplied with personal computers at least at subsidized rates. This will go a long way in helping to source for latest materials in their subject matter areas through the internet and carry out some other instructional duties. All these will enhance the much needed capacity building of the Nigerian teacher and his service delivery. Also, tertiary institutions saddled with the responsibility of teacher training should entrench ICT skills training as a vital component of their curriculum.

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