Status of Application of Information and Communication Technology (ICT) in the Management of Secondary Schools in Nsukka Education Zone, Nigeria

[1]Uche D. Asogwa, [1]T.O Ofoegbu, [1]Uche L. Igbokwe and [2]Onah Moneke
[1]Department of Arts Education, University of Nigeria Nsukka, Enugu State, Nigeria
[2]Department of Educational Foundations,
University of Nigeria Nsukka, Enugu State, Nsukka, Nigeria

Abstract: The study investigated the status of application of ICT in the management of secondary schools in Nsukka educational zone. Four research questions and four hypotheses guided the study. All the sixty principals in the zone constituted the population and sample of the study. Questionnaire was used to collect data for the study. Data collected was analyzed using means and t-test statistics. The findings of the study revealed among others that the extent to which ICT is utilized in the management of school records, school personnel, ensuring students' services and enhancing school instructional programmes are to a less extent. Results of the null hypotheses tested revealed that there was no significant difference on the mean ratings of male and female respondents on the use of ICT in the management of school records, school personnel, ensuring students' services and enhancing school instructional programmes in Nsukka educational zone. Based on the findings of the study, it was recommended among others that the national information technology policy should be reviewed to include a more comprehensive policy framework that will emphasize the use of ICT in all secondary schools for management, teaching and learning.

Key words: Information, communication technology, management, secondary schools, school personnel

INTRODUCTION

One of the most prominent features of the 21st century is the development and exploit of new communication media known as Information and Communication Technology (ICT). ICT is the communication media that supports activities that involves the creation, storage, manipulation and communication of information. The various tools used in ICT include computer, telephone, television, radio, computer-networking and internet to offer such services as online libraries, video-conferencing, e-mail, among others. Information and Communication Technology (ICT) is a global technology that has tremendously influenced development of all facets of human endeavours. Its application is indeed accountable for all the evident advancement of the so called developed nations of the world as against the less developed. That the world community is today said to be a global village is because of the application of ICT in closing the communication gap between persons, nations and continents in different parts of the globe. All aspects of human endeavors revolve around information and communication.

Management, according to Olaitan and coauthors is defined as the process of taking decision, planning, organizing, communicating and influencing, cooperating and coordinating, evaluating organizational activities in order to achieve stated objectives. The administrative mechanism for any school system must be based on certain cardinal principles of management which are principles of good documentation and negotiation, principles of decision making and problem solving. He further noted that these principles constitute important aspect of management functions. The effectiveness of these functions can be achieved through the use of ICT facilities such as telephone, computer net-working, e-mail and among others in processing, managing, disseminating timely and accurate information for organizational decision making and problem solving. Proper utilization of ICT facilities in the management of secondary schools will bring about well administered secondary schools, adequate record keeping and better learning environment as students and workers will have access to up to date information (Adelakun, 2005).

Secondary schools in Nsukka educational zone and perhaps in other parts of the country are facing complex and difficult times emanating from social, economic, technological, political changes and negligence of some guiding principles of management by their administrators. Secondary education as defined by National Policy on

Corresponding Author: Uche D. Asogwa, Department of Arts Education, University of Nigeria Nsukka, Enugu State, Nsukka, Nigeria

Education is the education children receive after primary education and before the tertiary stage. The main objectives of secondary education as stipulated by the policy document are for the preparation of individuals for useful living within the society and for higher education. However, the realization of these objectives is dependent on effective management of these secondary schools.

Secondary school management involves the execution of policies, procedures, rules and regulation as laid down by the school authorities (Amubenomo, 2000). Secondary school management is a formal system of activities designed to organize, supervise, plan and make decisions about a range of school activities based on established authority. Management functions are intertwined and corresponding to each other. Thus, the extent of realization of these functional activities requires assessment of ICT application in secondary schools, not only for instructional purposes but also for its effectiveness and efficiency in management. The application of ICT in the management of secondary schools will boost education and learning. For instance, the utilization of ICT will eliminate old system by which students admissions are recorded and stored. Spreadsheet and data-base packages can be used by school administrators to process, manipulate, store and retrieve students' records (Ndu *et al.* 1997). Preparation of examination time-table, lesson time-table and staff duty roster will also be easier when ICT is used. Furthermore, workers salaries and allowances, school fees and other levies can be paid through e-payment. ICT also enhances paper presentation to school personnel during their workshops or seminars. Application of ICT will also enable students, teachers and other school professionals equal access to information with their counterparts the world over. In most Nigeria schools, management officials still go through the laborious exercise of manually registering students, maintaining records of pupils' performance, keeping inventory list of supplies, paying bills and printing reports etc. The application of ICT brings great speed and accuracy to each of these tasks, along with the convenience of storing large quantities of information on small disks or others saving devices (Ogbonnaya, 2003).

Over the years, there has been a decline trend on the quality of administration by the school heads in the secondary schools in Nsukka education zone. Various reasons have been attributed to this ugly trend, part of which are ineffective school management, especially in the areas of personnel management, school records keeping, delivering of instructional programme and ensuring students' services as a result of reliance on manual practices and operations. ICT can be employed by school administrators to improve on these duties. Various ICT applications have been designed by software engineers to perform a variety of management tasks. It is against this background that this is designed to determine the extent of utilization of ICT in the management of secondary schools in Nsukka education zone.

Statement of the problem: Many schools in Nigeria, especially in Nsukka Educational Zone, still keep records in files, which are packed away in cabinets where they accumulate dust. These files are sometimes eaten up by rodents and cockroaches thus rendering them irretrievable. Great deals of routine management work in secondary schools still appear to be done manually by the authorities of schools in the educational zone. Access to ICT is a critical factor in the field of school management. For instance, school managers can use spreadsheet to prepare and access school financial records, prepare time-table and staff duty roster. Application of ICT will also enable management officials in registering students, maintaining records of pupils' performance, keeping inventory list of supplies, paying bills and printing reports. ICT application will bring great speed and accuracy to each of these tasks. It against this backdrop that the study is set to determine the status of application of information and communication technology in the management of secondary schools in Nsukka educational zone.

Purpose of the study: The main purpose of the study is to determine the status of application of information and communication technology in the management of secondary schools in Nsukka educational zone.

Specifically, the study sought to:
- Find out the extent of application of ICT in keeping school records
- Determine the extent of utilization of ICT in school personnel management
- Determine the extent of use of ICT in enhancing students' services
- Assess the application of ICT in enhancing school instructional programmes

Research questions: The following research questions guided the study:

- What is the extent of application ICT in the keeping of school records in Nsukka educational zone?
- To what extent is ICT used in the management of school personnel?

- How is ICT used in enhancing students' services in Nsukka educational zone?
- To what extent is ICT used in enhancing school instructional programmes in the educational zone?

Hypotheses: Four null hypotheses were formulated to guide the study and were tested at 0.05 level of significance:

- HO_1: There is no significant difference in mean scores of male and female principals on the use of ICT in keeping of school records
- HO_2: There is no significant difference in the mean scores of male and female principals in the application of ICT in the management of school personnel
- HO_3: There is no significant difference in mean scores of male and female principals in enhancing student's services
- HO_4: There is no significant difference in the mean scores of male and female principals on the use of ICT in enhancing school instructional programmes

MATERIALS AND METHODS

Design: The study utilized descriptive survey research design. Descriptive survey research is the one in which a group of people or subjects are studied by collecting and analyzing data from a few people or subjects considered to be true representative of the entire population of the study.

Population and sample: The population for the study is made up of the secondary school principals in Nsukka educational zone. There are sixty secondary school principals in the zone, made up of 19 females and 41 males. Total 31 of the secondary schools are in urban areas, while 29 are in rural areas. For this study, all the principals were used, since the population is small and manageable.

Instrument for data collection: The instrument for data collection is a structured questionnaire titled Information and Communication Technology Application of Principals (ICTAP). The instrument is divided into two sections of A and B. Section A: This study deals with personal data of the respondents. Section B has four clusters. Cluster A contains twelve items which sought answers to how ICT can be used in keeping school records. Cluster B has 9 items seeking answers on the extent of utilization of ICT

in managing school personnel. Cluster C has 9 items on how ICT can be used to ensure student's services. Cluster D contains 8 items on the use of ICT in the school instructional programmes. The instrument has four point scales as follows: Very High Extent (VHE) 4 points, High Extent (HE) 3 points, Less Extent (LE) 2 points, Not at All (NA) 1 point.

Validation of the instrument: The instrument was face validated by three experts, one each from Educational Administration and Planning, Computer Education and Measurement and Evaluation, University of Nigeria, Nsukka. The validation was based on language, structure and relevance of the instrument to the study. The suggestions and recommendations offered by the experts were taken into consideration in the final draft of the instrument.

Reliability of instrument: The internal consistency of the items was determined through Cronbach's alpha method. It yielded 0.80, 0.79, 0.83 and 0.81 coefficients for clusters A-D, respectively. The overall reliability is 0.90. The reliability indexes are high enough indicating that the instrument in reliable.

Method of data collection: Sixty copies of the questionnaire were administered to the target respondents directly by researcher and his assistants through personal contact. The researcher and his assistants waited and collected them back in order to ensure 100% collection rate.

Method of data analysis: Mean was used to answer questions while t-test was used to test hypotheses at 0.05 level of significance. Any statement with a mean between 3.50-4.49 was considered as VHE while any item with a mean between 2.50-3.49 was considered as HE. Similarly, any item with a mean between 1.50-2.49 was considered as LE and a mean between 0.50-1.49 was considered NA.

RESULTS AND DISCUSSION

Research question 1: What is the status of ICT use in the management of secondary school records? The data presented in Table 1, revealed that principals applied items 2, 3, 6, 8, 9, 11 and 12 to a low extent in the management of secondary school records while items 1, 4, 5, 7 and 10 were not applied at all. The indication of respondents on the items in this table was that the use of ICT in the management of secondary school records was to a very low extent.

Table 1: ICT Application in the management of secondary school records by secondary school principals

Item statement	$\overline{X_1}$	$\overline{X_2}$	$\overline{X_3}$	Decision
School management use data base to collect and store students admission records	1.3902	1.4211	1.400	NA
Word processing is used in typing and editing minutes of management meetings	1.7317	1.5263	1.66	LE
School management use Digital Video Display (DVD) ROM to store school inspection record	1.5610	1.4737	1.50	LE
Spread sheet is used to prepare student's attendance register	1.1951	1.2105	1.200	NA
School management use telephone to communicate parents on their children performance	1.4634	1.4737	1.460	NA
Word processing is used to prepare students' transfer and leaving certificate	1.5610	1.4737	1.53	LE
Data base is used to store students' academic performance record	1.3902	1.4211	1.400	NA
School management use spread sheet to prepare and access school financial records	1.9512	1.8947	1.93	LE
Digital Video Display (DVD) ROM is used to store school social activities report	1.5610	1.4737	1.53	LE
School management use spread sheet to prepare staff duty roster	1.3659	1.2632	1.33	NA
Spread sheet is used to prepare students' grade sheet	1.5854	1.6316	1.60	LE
School management use spread sheet to prepare school time table	1.5854	1.6316	1.60	LE

$\overline{X_1}$ = Mean for male principals (N = 41); $\overline{X_2}$ = Mean for female principals (N = 19); $\overline{X_3}$ = Overall means

Table 2: Extent of ICT use in school personnel management

Item statement	$\overline{X_1}$	$\overline{X_2}$	$\overline{X_3}$	Decision
Internet is used by school management to short-list names of appointed workers after interview	1.7317	1.5263	1.66	LE
Multi-media is used for preservation during new employees orientation	1.5610	1.4737	1.53	LE
Word processing is used for typing school policies and code of conduct for newly employed personnel	1.5854	1.6316	1.60	LE
School management use ICT application during personnel in-service training	1.3902	1.4211	1.400	LE
School administration uses online payment for payment of staff allowances	1.1707	1.2632	1.200	LE
School staff use television during recreation period in the staff room	1.1707	1.2632	1.200	LE
School staff use telephone for interaction between themselves and school management during school hours	2.1951	2.2105	2.200	LE
Power point packages is used for seminar presentation to staff during workshop	1.9512	1.8947	1.933	LE
Online payment is used by staff for their monthly contribution to pension administrators	1.5610	1.4737	1.533	LE

Table 3: Extent of use of ICT in enhancing students' services

Item statement	$\overline{X_1}$	$\overline{X_2}$	$\overline{X_3}$	Decision
Students pay school fees and do their registration via website	1.5366	1.5263	1.533	LE
Students use online screen simulation multi-media to have access to wide variety of experiment	1.1951	1.2105	1.200	NA
Boarding students use telephone to communicate with parents and relations	2.0244	1.9474	2.00	LE
Students engage in individualized learning using Computer Assisted Instruction (CAI)	1.1951	1.2105	1.200	NA
Students use spread sheet to do calculation	1.1951	1.2105	1.200	NA
Boarding students use e-mail services to send letter to parents and friends	1.2683	1.2632	1.266	NA
Students use video to watch religious films during school religious activities	1.3902	1.4211	1.400	NA
Students use visual libraries to source information in their subject areas	1.5854	1.6316	1.600	LE
Students use spread sheet to draw graphs in mathematics and physics	1.5854	1.6316	1.600	LE

Research question 2: To what extent is ICT used in school personnel management? The date in Table 2, shows that the principals applied all the items, to a less extent in the school Personnel Management. The indication of respondents on the items in Table 2 was that the extent to which ICT is used in school personnel management was short of expected impact.

Research question 3: What is the extent of use of ICT in enhancing students' services? The data presented in Table 3, showed that principals applied to a less extent items 22, 24, 29 and 30 in the management of school services while items 23, 25, 26, 27 and 28 were not applied at all. The indication of respondents on the items in the table was that the extent to which ICT is used in enhancing students' services in secondary schools is below standard.

Research question 4: To what extent is ICT used in enhancing instructional programme of schools? Date in Table 4 shows that item 32 was applied to a less extent while items 31, 33, 34, 35, 36, 37 and 38 were not applied at all. The indication of the respondents on the items in the table was that the extent to which ICT is used in enhancing instructional programmes in schools is nothing to write home about.

The data in Table 5 indicates that there is no significant difference in the mean rating of male and female principals on the status of ICT application in the

Table 4: Uses of ICT in enhancing instructional programmes of schools

Item statement	$\overline{X}_1$	$\overline{X}_2$	$\overline{X}_3$	Decision
Teachers use Computer Assisted Instruction (CAI) to deliver instruction to students	1.3902	1.4211	1.400	NA
Corel draw is used by teachers to prepare their teaching aids	1.1951	1.8947	1.933	LE
Students use tutorial instruction packages as simulation facilities	1.3902	1.4211	1.400	NA
Teachers use multi-media application to prepare instructional materials	1.3902	1.4211	1.400	NA
Teachers use online test to access students academic abilities	1.1951	1.2105	1.200	NA
Word processing is used by Teachersto prepare their lesson notes	1.3902	1.4211	1.400	NA
Teachers Microsoft word to sort their instructional materials	1.1951	1.2105	1.200	NA
Teachers use online screen simulation to give science students access to greater variety of experiment	1.1951	1.2105	1.200	NA

Table 5: T-test analysis of the mean scores of male and female principals on the use of ICT in the management of school records

Item statement	$\overline{X}_1$	$\overline{X}_2$	$\overline{X}_3$	Decision
School management use data base to collect and store students admission records	-0.136	58	0.892	NS
Word processing is used in typing and editing minutes of management meetings	0.622	58	0.536	NS
School management use Digital Video Display (DVD) ROM to store school inspection record	0.776	58	0.441	NS
Spread sheet is used to prepare student's attendance register	1.1951	1.2105	0.894	NS
School management use telephone to communicate parents on their children performance	-0.136	58	0.892	NS
Word processing is used to prepare students' transfer and leaving certificate	0.622	58	0.536	NS
Data base is used to store students' academic performance record	-0.136	58	0.892	NS
School management use spread sheet to prepare and access school financial records	0.178	58	0.859	NS
Digital Video Display (DVD) ROM is used to store school social activities report	0.622	58	0.536	NS
School management use spread sheet to prepare staff duty roster	0.776	58	0.441	NS
Spread sheet is used to prepare students' grade sheet	-0.136	58	0.892	NS
School management use spread sheet to prepare school time table	-0.136	58	0.892	NS

Table 6: The t-test analysis of the mean scores of male and female principals in the management of school personnel

Item statement	t-value	df	Sig (2-tailed)	Decision
Internet is used by school management to short-list names of appointed workers after interview	0.776	58	0.441	NS
Multi-media is used for preservation during new employees orientation	0.622	58	0.536	NS
Word processing is used for typing school policies and code of conduct for newly employed personnel	-0.136	58	0.892	NS
School management use ICT application during personnel in-service training	-0.136	58	0.892	NS
School administration uses online payment for payment of staff allowances	-0.823	58	0.414	NS
School staff use television during recreation period in the staff room	-0.823	58	0.414	NS
School staff use telephone for interaction between themselves and school management during school hours	-0.136	58	0.892	NS
Power point packages is used for seminar presentation to staff during workshop	0.178	58	0.859	NS
Online payment is used by staff for their monthly contribution to pension administrators	0.622	58	0.536	NS

management of school records. This arises from the fact that the items have significant values ranging from 416 and above which are >0.05 level on which the hypothesis was postulated. The null hypothesis is therefore accepted as stated.

The data in Table 6 also shows that there is no significant difference between the mean scores of male and female principals on the extent of use of ICT in school personnel management. This is because the items have significant values between 414 and above which are >0.05 level on which the hypothesis was postulated hence we accept the null hypothesis of no significant difference between the mean rating of male and female on ICT application in the school personnel management.

From Table 7, it is equally observed that here is no significant difference in the mean rating of female and male principals on the use of ICT in enhancing students' services in the secondary schools. From the Table 8, it is seen that the items have significant values ranging from 667 which are >0.05 of significant on which the hypothesis was postulated. The null hypothesis is therefore accepted as stated.

The data presented in Table 8 shows that there is no significant difference in the mean rating of male and female principals on the application of ICT in enhancing instructional programmes in schools. Reason for the fact that the items have significant values between 414 and above which are >0.05 level on which the hypothesis was postulated. Therefore, the null hypothesis is accepted. The deduction here is that gender does not influence the application of ICT in school activities.

Table 7: The t-test of the mean scores of male and female principals in ensuring student's services

Item statement	t-value	df	Sig (2-tailed)	Decision
Students pay school fees and do their registration via website	0.073	58	0.942	NS
Students use online screen simulation multi-media to have access to wide variety of experiment	-0.136	58	0.892	NS
Boarding students use telephone to communicate with parents and relations	0.432	58	0.667	NS
Students engage in individualized learning using Computer Assisted Instruction (CAI)	-136	58	0.892	NS
Students use spread sheet to do calculation	0.041	58	0.967	NS
Boarding students use e-mail services to send letter to parents and friends	-0.136	58	0.892	NS
Students use video to watch religious films during school religious activities	-0.136	58	0.892	NS
Students use visual libraries to source information in their subject areas	-0.136	58	0.892	NS
Students use spread sheet to draw graphs in mathematics and physics	-0.136	58	0.892	NS

Table 8: The t-test analysis of the mean scores of male and female principals on the use of ICT in enhancing school instructional programmes

Item statement	t-value	df	Sig (2-tailed)	Decision
Teachers use computer assisted instruction (CAI) to deliver instruction to students	-0.136	58	0.892	NS
Corel draw is used by teachers to prepare their teaching aids	0.178	58	0.859	NS
Students use tutorial instruction packages as simulation facilities	-0.136	58	0.892	NS
Teachers use multi-media application to prepare instructional materials	-0.136	58	0.892	NS
Teachers use online test to access students academic abilities	-0.136	58	0.892	NS
Word processing is used by teachers to prepare their lesson notes	-0.136	58	0.892	NS
Teachers Microsoft word to sort their instructional materials	-136	58	0.892	NS
Teachers use online screen simulation to give science students access to greater variety of experiment	-136	58	0.892	NS

Application of ICT in the management of schools records: The data in Table 1 revealed that out of the 12 items of the table, 7 items were applied to a very low extent while 5 of the items were not applied at all. This indicates that school managers still rely heavily on the old system of keeping records with less emphasis on ICT. This is in agreement with what Ogiegbaen and Iyamu (2005), said that many establishments in Nigeria including educational institutions still keep records in files and tucked them in filling cabinet where they accumulate dust and consequently eating up by rodents and cockroaches, thereby rendering them irretrievable.

Use of ICT in school management: The data in Table 2 shows that all the items were applied on the school personnel management but that it was to a less extent. The reaction of respondents was that the extent to which ICT is utilized in school personnel management is short of expected impact. This goes to confirm observation made by Carnoy (2004) that school authorities hardly use ICT to manage the quality of output or raise teaching and non-teaching personal productivity.

Use of ICT in enhancing students' services: Table 3 revealed that 4 items out of 9 items in t he table were applied, leaving 5 of the items unapplied thus, showing discouraging attitude exhibited on the application of ICT in enhancing students' services in schools by principals or school authorities.

Use of ICT in enhancing instructional programmes: Data in Table 4 shows that only an item was applied and it was to a less extent while 7 items in t he same table were not applied at all. The indication is that the extent of ICT application in enhancing instructional programmes in the schools is nothing to write home about. This conforms with the assertion of Okebukola in Ogiegbaen and Iyamu (2005) that in over 90% of public secondary schools in Nigeria, chalk-board and text books still dominate classroom activities. The revelation in Table 4 is also inconsonance with the statement of Carnoy which state that the challenges in the way young people learn as a result of using ICT are much smaller than expected.

CONCLUSION

The application of ICT in the management of school programmes in Nsukka educational zone is by all standard very low. This implies that old systems of keeping records and method of teaching among other things are still much in practice while there is less emphasis on ICT introduction and utilization. Furthermore, the level of attitude exhibited on the introduction and application of ICT in school activities by school authorities is discouraging. This means that preparing the present generation of young and old people for further workplace that will undoubtedly be characterized by ICT is nowhere in place at the schools in the zone.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

- The national information technology policy should be reviewed to include a more comprehensive policy framework that will emphasize on ICT utilization in all secondary schools
- School personnel should be trained to acquire skills necessary for the use of ICT in school management; so as to enhance efficiency in record keeping, storage and other managerial capabilities associated with ICT application
- As a way of preparing the present generation for future workplace that will obviously involve ICT utilization, school authorities should avail secondary students the opportunity of instructional application of ICT early in school and encourage them to embrace its utilization for their academic activities
- Teachers should be encouraged and motivated to improve on their skills around the area of ICT for effective classroom teaching and management

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