COMPARATIVE ANALYSIS OF PRINCIPALS' ICT COMPETENCIES FOR MANAGEMENT OF INFORMATION SYSTEM IN PUBLIC AND PRIVATE SECONDARY SCHOOLS IN ANAMBRA STATE, NIGERIA

[1] Ikediugwu, Nkechi P. *Prof* & [2]Anyanwu, Jude A.
[1&2]Department of Educational Management and Policy Nnamdi Azikiwe University, Awka, Nigeria

Abstract
The study ascertained the level of Principals' ICT competencies for management of information system in public and private secondary schools in Anambra state. Two research questions and two null hypotheses guided this study. The design for the study is descriptive survey. The population comprised of 682 principals from public and private secondary schools in the state. The sample size 434 was selected using proportionate stratified random technique. The instrument for data collection was Principals' ICT Competency Test (PICTCT). The instrument was validated by experts and reliability was established using Kuder-Richardson 21 formula which yielded a value of 0.71. Mean and standard deviation were used to answer the research questions and t-test was used to test the hypotheses at 0.05 level of significance. The findings of this study were that, in web based/networking private school principals were very competent while principals of public school were not, in data base management, public school principals were not competent while private school principals were moderately competent. It was also found out that there was significant difference in mean competency scores of public and private secondary school principals in web base/ networking competency. Based on the findings, it was recommended that the educational management board in the state should organize seminars, workshops and in-service training for principals of public and private secondary schools in order to improve their ICT competencies for the management of their school information system.
Keywords: principal, ICT Competencies, Management of Information system (MIS)

Introduction

In Nigeria as in other developing countries of the world, education is intended to lead towards the attainment of broad national goals. To achieve these goals, concerted efforts are made to ensure the provision of quality education at all

levels. Thus, education becomes the corner stone for development and the basis for literacy, skill acquisition and technological advancement. Every secondary school is led by an administrator who is also called the principal. He controls the human and material resources of the school. The principal is the administrative head and leader of instruction in the school organization.

For the effective management of these resources in this modern and digital age, the computer system and its accessories and technologies have some roles to play. Recognizing this, the Federal Government of Nigeria (FGN, 2014 P. 17) states thus, 'in recognition of the prominent role of Information and Communication Technology (ICT) in advancing knowledge and skills necessary for effective functioning in the modern world, there is urgent need to integrate ICT into education in Nigeria'. Today Information and Communication at any level and place is possible through social networking. The management of information system has become a combined effort of a computer system and communication technologies which finds its broader fulfillment in ICT.

ICT as product of scientific innovation and invention facilitates and enables the assessment and management of information over a network connection for the purposes of communication. Onyebuchi as quoted in Achukwu and Nnajiofor, (2012) defines ICT as any equipment or interconnected system or sub system of equipment that is used in the management, movement, control, display, switching, interchange transmission or reception of data or information processing and electronic communications to be handled by ICT experts, who are equipped with capabilities that will maximally utilize ICT for the improvement of society. The components of ICT include the network provision, computer hard and soft wares, electronic media, storage devices like flash drive, memory chips, USB among others. These are called the basic building blocks of ICT. (Nwana, 2009). Information technology has serious implications on the medium of communication. It therefore becomes an interconnectivity of systems or sub system of electronic equipment that are used in the management of information.

Information management therefore, involves the recording, correct storage, retrieval and use of information for every effective decision making in an organization. In information management, the guiding principle is that information must be readily available at the time and in the form required. It must be accurate, reliable and informative for the basis of functional decision. Management information system now becomes the application of electronic media in managing, processing, storing, retrieving and communication of information for decision making.

In the management of organization at any level, decision-making is a very basic process, decisions are reached on future plans using available data. Effective decision making requires adequate, timely and reliable data and procedure. Thus, there is the need for effective management information system (MIS) to generate information through which sound decisions could be based. Okoye and Adigwe (2008) put it thus MIS is a generic term for all applications of technology and management techniques to produce, communicate and use information in business

and administration. The aim is to use formalized procedures to provide management with appropriate and timely information from all relevant sources so as to enable the manager make timely and effective decision. Therefore management of information system is a processing procedure developed within an organization and integrated for the purpose of providing timely and effective information to support decision making and other necessary management functions. These include: data processing, telecommunication, office automation, and word processing and media publications.

In order for the school management to carry out these functions certain level of competencies are required. Competencies are skills in doing or performing an art well. According to Okeke and Ifesi (2018), it is defined as the proficiency or dexterity that is acquired or developed through training or experience. Continuing Okoro and Ifesi (2016) see competence as the ability which comes from a person's knowledge and aptitude to do something efficiently. According to Pelgrum and Law (2003) competencies that need to be developed at this early stage of ICT adoption will include, training in the use of common office application program, such as sending of e-mails, WhatsApp, Facebook, browsing on the internet and the use of different window operating systems and applications in administration. But Mbakwem and Okeke, (2007) explain that ICT competency could be seen in the willingness to demonstrate the acquired ICT skills and use them effectively in accordance with the procedure that must be followed to ensure full practice and/or application in the system. Therefore principals should be adequately prepared, trained and equipped with relevant ICT tool/skills such as computer-mediated communication, internet, electronic publishing, video conferencing and multimedia and in social networking as to fit into the modern day system of management. The present study considered principals' ICT competencies in web based/networking and database management.

Web based/Networking competency is about being proficient in using digital technology, communication tools and networks to access, manage, integrate, evaluate and create information in order to function in a knowledge society. This is called Social networking. Social networking according to Ikwuka, Egwu, Onimisi and Obumenke-Okeke (2018) is a form of modern communication channels through which people connect to one another, share ideas, experience, pictures, message and information of interest. Social networking according to Yeboah and Ewur (2014) are web-based services that enable individuals to construct a semi-profile within a bounded system, articulate a list of other users with who to share connection with. In education school principals will adopt its use in communicating, sending and receive information from the school community and from parents. Supporting this view Sheninger (2014) assert that principals could utilize these social networks to communicate, collaborate, acquire resources, elicit feedback, and get support and share idea, data, strategies and information with other stakeholders. It involves the use of internet-based computer and other digital components like android phone and window phones, iPad, and camera, flash drive to send and receive educational resources and information from

the web and share it. It could be in the form of uploading of school result on the school portal. e-mail, WhatsApp, Facebook, Twitter, U-tube, browsing on the internet, either with the phone or computer and being able to deposit the resource on the web site of the school

Database management competency is the skills and capabilities that facilitate the use and development of data bank of an organization. It is a set of programs and skills that provide a method of arranging data in files and folders in an ordered fashion called fields which in turns translates into characters. A character is the smallest element in a file and can be numeric, alphanumeric or alphabetic and chronologic to limit duplication and has the ability to make changes or sort items either in sequential, direct or indexed sequential depending on which method that was used. (Ohanka, 2016). Database management refers to the orderly arrangement of school information in a computer system for easy access. For Oluwalola (2017), it is the management method of controlling all records throughout the life circles, from creation to retention inside in an electron medium (computer). Therefore, an effective database management serves as the storage device for the survival of any school organization.

For a school, public or private to function effectively and achieve their aims their management should be attuned to ICT. To achieve this the government of Anambra State through its Anambra State Integrated Development Strategy (ANIDS) has distributed computers and internet facilities to secondary schools in Anambra state to facilitate teaching and learning and school management. This gesture of the state government is to ensure that all the secondary schools across the state are computerized to facilitate teaching and learning and for the principals to become ICT compliant and to enhance their managerial functions. This calls for a comparative study to determine the ICT competencies of public and private secondary school principals towards the achievement of this project.

Statement of the Problem:

In spite of all efforts made by PPSSC coupled with the level of awareness and utilization of ICT in different organizations and the society at large, it is a common occurrences and experiences in most public secondary schools in the state that they principals have not embraced ICT in administration but have continued to use the traditional method of information management which encourages misplacement, easy destruction, mutilation of official records and delays in decision making. With that method there is difficulty in retrieval and submission of official records when need be, all these have been blamed on the poor ICT knowledge of the principals in administration.

But some people say that most private secondary schools in the state have since maximized the use of these ICT facilities in administration and it has added value to their system because their principals are young people and are computer literate. In line with this trend there is an urgent need for a comparative study to ascertain the ICT competencies of principals of public and private secondary

schools in the state for Management of Information System in the secondary schools in the state,

Purpose of Study

The purpose of this study was to compare the ICT competencies of public and private secondary school principals in Anambra state for management of information.

Specifically, the study sought out the following.

1. To compare public and private school principals' level of possession of Web-Base/networking competencies for management of information.
2. To compare public and private school principals' level of possession of data base management competencies for management of information.

Research Questions:

1. How comparable are public and private school principals' in the level of possession of web based/Networking competencies?
2. How comparable are public and private school principals' in the level of possession of database management competencies?

Hypotheses

The following hypotheses were tested at 0.05 level of significance

1. There is no significant difference in the mean competency scores of public and private school Principals in web based/Networking.
2. There is no significant difference in the mean competency scores of public and private school Principal's ICT data base management

Method

The design for this study is descriptive survey. The reason for choosing this method is that the researcher made use of information and data collected from a group of people that represented the entire population. The total population of study was 683 principals. This population was made up of 257 public secondary school principals and 426 private secondary school principals, corresponding to the total number of secondary schools in the state. The sample size consists of 417 respondents made up of 158 public and 259 private secondary school principals respectively. This sample was gotten through proportionate stratified random sampling technique 60% of the principals in each education zone were obtained from each of the strata.

The instrument that was used for data collection was achievement test titled Principals' ICT Competency Test (PICTCT). This test was developed by the researcher to elicit information on the ICT competency of principals in the state. Items of the instrument were generated from the literature and the previous

experience of the researcher in the field of computer science. This instrument has two sections, Section A and Section B. Section A of the instrument sought information on demographic data and type of school, while section B comprised 20 test items organized in two clusters B_1 and B_2. Cluster B_1 measured web based/network competency and Cluster B_2 measured database management competency. The instrument was validated by two experts from the Department of Educational Management and Policy and one expert from the Department of Measurement and Evaluation all in the Faculty of Education, Nnamdi Azikiwe University Awka. Based on their constructive criticisms and suggestions, the instrument was finally reconstructed into achievement test instead of a questionnaire. To determine the reliability of the instrument, it was pilot tested in Owerri municipal secondary schools in Imo State. 21 principals used were randomly sampled. The data collected were analyzed and result of the pilot testing was used in calculating the internal consistency of the instrument using KuderRichardson 21 formula and reliability value obtained was 0.71.

The researcher employed the direct delivery technique on the administration of the test with the help of three research assistants who were briefed on how to conveniently administer and collect the answer sheets on the spot. For the private secondary school, the principals were visited in their schools and the test was administered to them. A total number of 417 copies of the test items were distributed and collected. This approach ensured 100% rate of return of the instrument.

The test was scored by awarding 1 point to each correct answer and 0 for a wrong answer. The data collected were analyzed using frequency and converted to percentage. The criterion level of competency is 50%. It means that any item that the respondents' percentage was not up to 50% was considered not competent while those that get up to 50% were considered moderately competent and those above were considered as very competent.

It stands thus:

1-49 %	NC = Not competent. **(Low)**
50-69 %	MC = Moderately Competent. **(Moderate)**
70-100 %	VC = Very competent. **(High)**

The hypothesis was tested using Chi-square at Alpha level of 0.05 level of significance to determine the significance difference between ICT competency scores of public and private secondary school principals in the Anambra state.

Results: Research Question 1. To Compare public and private school principals' level of possession of Web base/networking competencies.

Table 1: Frequency and Percentage responses on principals' level of possession of Web base/networking competencies by school type

	Freq		%	Fre	%	Remark	Fre	%	%	Remark
Which of the following is an example of an image file	63	39.9%	95	60.1%		DNP	155	59.8%	40.2%	PSS
In developing a multimedia presentation first consider	54	34.2%	104	65.8%		DNP	170	65.6%	34.4%	PSS
3 Which of the following is an acceptable use of e-mail	67	42.4%	91	57.6%		DNP	175	67.6%	32.4%	PSS
	4. which of the following are examples of safe use of internet	95	60.1%	63	39.9%	PSS	183	70.7%	29.3%	PSS
	5 when connecting and there is error message of fails to connect the first thing to do is	98	62.0%	60	38.0%	PSS	146	56.4%	43.6%	PSS
	6. The best software for accounting is	80	50.6%	78	49.4%	PSS	137	52.9%	47.1%	PSS
	7. getting into someone's e-mail without his permission is	59	37.3%	99	62.7%	DNP	172	66.4%	33.6%	PSS
	Adding comment to a blog is known as	62	39.2%	96	60.8%	DNP	162	62.5%	37.5%	PSS
	Soft wares that block access to certain websites is called	88	55.7%	70	44.3%	PSS	163	62.9%	37.1%	PSS
	A computer virus is transmitted by	94	59.5%	64	40.5%	PSS	108	41.7%	58.3%	DNP

In table 1, items 4, 5, 6, 9 and 10 had a percentage scores that showed that public school principals are competent while in all the other items they are not competent while for private school principals percentage scores showed that they competent in all the items except in item 10. Therefore it could be said that public school private principals are highly competent on web based/networking competencies than the public school principals.

Q2. To compare public and private school principals' level of possession data based management competencies for management of information

Table 2: Frequency and Percentage on principals' level of possession data based management competencies by school type

Table 2: Frequency and Percentage o……

	Public (158)				Private (259)				
	Pass	Failed	Pass	Failed					
	Freq	%	Fre	%	Remark		Fre.	%	Fre,	%	Remark
11. A raw material used to produce information in a computer is	54	34.4%	103	65.6 %	DNP	176	68.0%		83	32.0%	PSS
12 The security measure used to protect a school data bank is	38	24.1%	120	75.9 %	DNP	171	66.0%		88	34.0%	PSS
13 When planning a data base the first step is to			69	43.7%	89	56.3%	DNP	68	26.3%	191	73.7%	DNP
14 What does multi-tasking mean			59	37.3%	99	62.7%	DNP	81	31.3%	178	68.7%	DNP
15 A facility that gives access to many website around the world is			65	41.1%	93	58.9%	DNP	79	30.5%	180	69.5%	DNP
16 The connection of computers so that information can be shared is			58	36.7%	100	63.3%	DNP	184	71.0%	75	29.0%	PSS
17 A file that records a user's website visited is called			78	49.4%	80	50.6%	DNP	103	39.8%	156	60.2%	DNP
18 Data base management requires the programmer to do all except			49	31.0%	109	69.0%	DNP	173	66.8%	86	33.2%	PSS
19 All of these are different methods of data processing except			46	29.1%	112	70.9%	DNP	72	27.8%	187	72.2%	DNP
20 Which of the following would be the most reliable source of preserving data			79	50.0%	79	50.0%	PSS	205	79.2%	54	20.8%	PSS

PSS= Possessed
DNP= do not possess

In table 2, the percentage score showed that the public school principals were not competent in all the items on this cluster except only in item 20 where it showed them to be moderately competent while the private school principals are competent in items 11, 12, 16, 18, and 20 while in items 13, 14, 15, 17 and 19 showed not competent.

Table 3: Chi-square analysis of principals' level of possession of Web base/networking competencies by school type

		Public (N=158)		Private (N=259)		X^2	P-Value	Remark
		Pass	Failed	Pass	Failed			
1.	Item	63	95	155	104	15.69	.00	S
2.	Item	54	104	170	89	39.06	.00	S
3.	Item	67	91	175	84	25.51	.00	S
4.	Item	95	63	183	76	4.89	.02	S
5.	Item	98	60	146	113	1.29	.25	NS
6.	Item	80	78	137	122	.20	.65	NS
7.	Item	59	99	172	87	33.55	.00	S
8.	Item	62	96	162	97	21.44	.00	S
9.	Item	88	70	163	96	21.14	.14	NS
10.	Item	94	64	108	151	12.44	.00	S

The analysis in table 3 shows that there is a significant difference in the scores of public and private school principals on their level of possession of Web base/networking competencies as seven out of the 10 items listed had p-value less than the stipulated 0.05 level of significance. The null hypothesis of no significant difference was therefore rejected.

Hypothesis 2: There is no significant difference in the scores of public and private school principals' on their level of possession data based management competencies

Table 4: Chi-square analysis of principals' level of possession data based management competencies by school type

		Public (N=158)		Private (N=259)		X^2	P-Value	Remark
		Pass	Failed	Pass	Failed			
11.	Item	54	103	176	83	44.53	.00	S
12.	Item	38	120	171	88	69.15	.00	S
13.	Item	69	89	68	191	13.49	.00	S
14.	Item	59	99	81	178	1.62	.20	NS
15.	Item	65	93	79	180	4.91	0.2	S
16.	Item	58	100	184	75	47.49	.00	S
17.	Item	78	80	103	156	3.68	.05	NS
18.	Item	49	109	173	86	50.47	.00	S
19.	Item	46	112	72	187	.08	.77	NS
20.	Item	79	79	205	54	38.39	.00	S

The analysis in table 4 shows that there is a significant difference in the scores of public and private school principals on their level of possession of data based management competencies as seven out of the 10 items listed had p-value less than the stipulated 0.05 level of significance. The null hypothesis of no significant difference was therefore rejected

Discussion Level of competency possessed by public and private secondary school principals' in Web based/Networking competency

The result showed that the public school principals are moderately competent while private school principals are highly competent in web based/Networking. Some of the items in this cluster deal with internet communications, browsing, chatting, text messaging, e-mail and other types of social networking. This is quite surprising because social networking is the in thing now. ICT facilities have been provided in all schools in the state yet the principals of public secondary schools are still not at home with their use as such not competent. This finding is supported by Abiogu (2011) in his study when he observed as saying that to some extent, the government have provided computer systems and laptops with internet connectivity to the schools. Granted the provision of these facilities and seminars and workshop organized yet the desired result has not been possible in most public schools unlike some private schools.

The findings of Egboka (2012) disagreed with this by saying that although many teachers have been trained to gain knowledge and understanding of ICT to support effective teaching; have participated in ICT based conferences and have been train on how to keep individual records of students for uploading to the institution portal but no empowerment have been provided. Supporting the findings of Egboka, Ellioth, (2004) in his study says that access is not synonymous with competency and basic skills needed to be develop. On the contrary private school principals showed high level of competency in web based/networking. Adeniyi (2009) in his report attributed this development to the young caliber of the management team of most private schools who are mostly the young people with knowledge and interested in social networking such as Facebook, WhatsApp, E-mail, Twitter, Instagram. The findings of Iwuagwu (2010) supported the view when he says that many private schools have gone very far ahead of public schools, such that admission forms, school results and adverts are posted and published on their web sites.

Unfortunately, the public secondary principals are majorly older people who did not have formal training in computer studies and as such are incompetent in the use of computer based learning skills. This finding is supported by the study of Okorafor, Maduuko and Achigbo (2011) they observed that this 'net' generation is so computer competent (digital savvy) that in general they are more proficient with the medium than most of their teachers. Many of the principals shared out some of their official duties which they ought to have done them themselves by using their

laptop right before them in the office rather than the school typist who still continues to use manual typewriters even now. This in agreement with the findings by Oguike (2010) which says that principals should afford themselves the opportunity of making use of the computer system in doing some of their official duties other than shifting it to another or using the traditional analogy system. This constitutes to waste of time, divulging of official and confidential information.

Level of competency possessed by public and private secondary school principals' in Data base management

The result here revealed that principals of private school are not competent while public school principals are moderately competent. This finding was not quite surprising because the issue of development of school portal and data base is a recent introduction in secondary schools in the state. The findings of the present study is supported by the findings of Ihuoma (2011) when he says that with the introduction of portal for the submission of school data and productivity returns without adequate training in computer programming of the principals will retard the goal of database management being advocated for. For the fact that the private school principals showed they have skills for the arrangement, organization, locating, accessing and retrieval of data and communication is a credit to the measure of data competency but does mean being competent. The findings of Ohanaka (2011) supported this view that data base management requires a computer specialist who has been trained in data programming. But inputting data into the data base of any institution does not necessarily mean being competent. On the contrary, Nwabueze and Anyira (2011) observed in their study that with the provision of software for data management among other things in the computer system, users of different portal can access, send, open and recognize different file/format (PDF) like the acrobat and adobe reader. This will enable principals manage their data base. If they can do this, they possess data literacy skill. This is in line with the findings in a study of Bruce (2003) which states that data literacy skills have to do with how data is being sourced or located, how to access data that is required and evaluate the accessed data to suit the demand of the information seeker. This is also in line with the study of Omenyi (2007) when she says that it requires the school managers as well as other personnel in the school with rapid, accurate access to wide variety of data stored in the school computer relating to students and staff personnel management, financial transactions of the school, academic records and other administrative information database to import these data with easy and as such does not require much specialty.

The test of hypothesis presented in table 3 showed that there is no significant difference in the competency score of the public and the private school principals in Database management.

Conclusion

From the analysis, interpretation and discussions of result of this study as regards the research questions and hypotheses, the following conclusions were drawn:

From the findings it is show that the private secondary school principals possess high level of ICT competency in web based/networking but moderately competent in database management. While the public secondary school principals are moderately competent and web based/networking but not competent in data base management. Also there are much significant difference in the ICT competencies possessed by public and private secondary school principals in database management. Also in web based/networking that there are significant different between the two schools. This difference may be as a result of differences in policies, ideologies and management's interest of the private secondary schools and lack of seriousness, inadequate training and retraining of principals of the public secondary school towards the implementation of MIS in their schools.

Recommendations

For there to be a good management of information system in the secondary schools, there is an urgent need to organize frequent in service trainings, seminars and workshops for principals in the secondary schools in the state by computer professionals. This will enable the principals to possess certain level of ICT competencies. Irrespective of the type of secondary school, ICT competency is very much needed at this digital information age and global competitiveness and Anambra state secondary schools need not to be left**.** Laptop or desktop computers should be made available by the government to the principals at a reduced price or in of form of loan to be gradually deduced from their salary to enable them, learn to use them in administration.

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