

Information and Communication Technology Competencies Needed By Principals for Administrative Effectiveness in Secondary Schools in Anambra State

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Abstract

This study examined the ICT competencies needed by secondary school principals for administrative effectiveness in secondary schools in Anambra state. To this end, the researchers outlined 3 purposes, 3 research questions and 3 hypotheses tested at 0.05 level of significance. A descriptive survey research design was adopted for the study. The entire population was used for the study. Data was collected using a questionnaire of 41 items titled ICT Competency Questionnaire (ICTCQ) which was validated by experts from the faculty of education, Nnamdi Azikiwe University Awka. A reliability index of 0.71 was obtained using Cronbach's alpha. Data analysis was done using mean and t-test. The findings revealed that principals of secondary schools in Anambra state need computer operational competency, internet/networking competency and ICT safety competency.

Keywords: *ICT, information and communication technology, administrative effectiveness, competency, competency needs.*

Introduction

Nigeria, like most developing countries, is battling to attain the enviable level of political, social, economic and technological achievements of the developed countries. One recognizable means by which the country aims to achieve this objective is education. Education in every country of the world has been considered very important for personal and societal development. In order to achieve this, FRN (2013) highlighted that quality education should be given at all levels of education: primary, secondary and tertiary.

Secondary education play a great role in imparting and equipping individuals with knowledge, skills, values and attitudes. The secondary level of education is the link between the primary and tertiary levels.

The importance of secondary education is geared towards providing all primary school leavers with the opportunity for education of a higher level irrespective of gender, social status, religious or ethnic background; offer diversified curriculum to cater for the differences in talents, opportunities and future roles; provide trained manpower in the applied science, technology and commerce at sub-professional grades; develop and promote Nigerian languages, art and culture in the context of world's cultural heritage; inspire students with a desire for self-improvement and achievement of excellence among others (FRN, 2004).

The realization of these goals depends on how the principals of secondary schools are able to synthesize these variables.

The principal is the chief executive who performs the necessary administrative and managerial functions for the improvement of the secondary school system. Williams (2009) observed that today's school principals are expected to be educational visionaries, instructional and curriculum leaders, assessment experts, disciplinarians, community builders, public relations and communication experts, budget analysts, facility managers, special programmes managers, as well as guardians of various legal, contractual and policy mandates and initiatives.

In performing this heavy administrative mandate, the principal need competencies in Information and Communication Technology (ICT). Ali (2004) defined ICT as the "physical structure of network of computer based systems for the purpose of organizing, processing, communicating, accessing, presenting, storing, retrieving and simplifying information, when needed and in the form it is needed. In this work, ICT is taken to mean all contemporary digital tools as computer systems, telecommunication systems and multimedia, networked and standalone plus hardware and software, which can be used in education, in order to facilitate the achievement of goals. Competency on the other hand is an integrative set of knowledge, abilities, attitudes and the capacity to apply and transfer them that creates the premises of successful accomplishment of certain complex activities or tasks and of effective functioning within a given context or role (Glava and Glava 2006). ICT competence therefore, involves knowledge of skills, knowledge of how and when to apply the skills as well as knowledge of reasons for using the particular ICT or the contributions of that ICT to the solution of problem (Akudolu 2006).

Most secondary school principals in Nigeria, Anambra state inclusive, appear to lack the necessary competencies in ICT needed for the realization of educational objectives and for administrative effectiveness. This has presented challenges to Anambra state in its bid to run and deliver education needed for sustainable development of the state. Anambra state government under the leadership of Governor Peter obi in 2013 supplied over twenty-five thousand computers and other ICT facilities to secondary schools across the state. A great deal of funds have also been invested to facilitate the integration of ICT in schools in the state by the present

government. But in spite of these large expenditure of funds, the potential for ICT to alter principals' use of computer for instructional and administrative purposes in secondary schools in Anambra state seem not to be fully realized. It was based on this background that this study examined the ICT competencies needed by secondary school principals for administrative effectiveness.

Statement of the problem

Secondary education is geared towards providing all primary school leavers with the opportunity for education of a higher level irrespective of gender, social status, religious or ethnic background; offer diversified curriculum to cater for the differences in talents, opportunities and future roles; provide trained manpower in the applied science, technology and commerce at sub-professional grades; develop and promote Nigerian languages, art and culture in the context of world's cultural heritage; inspire students with a desire for self-improvement and achievement of excellence among others. Secondary schools in Anambra state seem not to have lived up to its expectations in achieving these lofty objectives. The principals who are expected to be educational visionaries, instructional and curriculum leaders, assessment experts, disciplinarians, community builders, public relations and communication experts, budget analysts, facility managers, special programmes managers, as well as guardians of various legal, contractual and policy mandates and initiatives appear to lack the necessary competencies in ICT to be able to effectively carry out these administrative duties. This has presented challenges to Nigeria and indeed Anambra state in its bid to run and deliver education needed for sustainable development of the state. The aim of this study therefore is to investigate the ICT competencies needed by secondary school principals for administrative effectiveness.

Purpose of the study

The main purpose of the study was to examine the ICT competencies needed by secondary school principals for administrative effectiveness. Specifically the study investigated:

1. Computer operational competencies needed by secondary school principals for administrative effectiveness
2. Internet/networking competencies needed by secondary school principals for administrative effectiveness
3. ICT safety competencies needed by secondary school principals for administrative effectiveness.

Research Questions

The following research questions guided the study

1. What are the computer operational competencies needed by secondary school principals for administrative effectiveness?
2. What are the internet/networking competencies needed by secondary school principals for administrative effectiveness?

3. What are the ICT safety competencies needed by secondary school principals for administrative effectiveness?

Literature Review

Information and Communication Technology Competency

Information and Communication Technology (ICT) competencies as the skills and abilities of school principals for using computers to store and retrieve information when needed (Edafiogho, 2007). The increasing complexity of education business and the corresponding pressure on available resources, demand that school administrators should depend on powerful management information systems to achieve effective school management. ICT provides administrators opportunities that enable them to learn and reach out to other sources of administrative knowledge. In fact, according to Edafiogho (2007), as administrators become increasingly information-literate, they develop skills in processing, interpretation, analyzing and conveying knowledge. He further remarked that ICT has the capacity for automatic processes and saves time thereby allowing school administrators to concentrate as well as improve the quality of contact time with staff and students. If administrative functions at schools and other levels of the educational system are to be carried out efficiently and effectively, it is necessary that our educational administrators should be knowledgeable in ICT, since no administrator can rise above the level of what he knows. Secondary school principals are expected to have acquired a number of competencies including ICT skills, during the pre-service training. At the moment, ICT has brought much challenge to all areas of school administration. And as rightly noted by Association of African Universities (AAU) ICT Reports (2005), competency in ICT would facilitate administrative activities in staff management, students' administration, finances, assets and maintenance, office activities and communication. In order to perform the duties of a principal effectively, Gurr (2000) and Bishop (2002) pointed out that the principal's knowledge and competence in ICT is essential.

It therefore can be established that principals have a lot of roles to play in school administration. They require improvement in ICT competencies in carrying out these roles. Accordingly, this study identified three key ICT competency areas. These include: computer operational competency, internet/networking competencies and ICT safety competencies.

Computer Operational Competency

Basic operational knowledge and skill of computer is a core ICT competency needed of every school principal. Even where most principals have firm ideas of how they would like to apply ICT in the school administration, many of them appear to be held back by lack of technical skills and knowledge. Anyone with fair knowledge of ICT will agree that competency in operating computer is pre-requisite for acquiring other ICT competencies. Computer has been defined as device that automatically performs operations, sorts files and edits; making it possible to process

information with great speed, accuracy and reliability (Okoroafor, 2010). It combines the efforts of hardware, software and personnel to operate (Okwuanaso, 2004). The computer hardware comprises all physical components of the computer which remains useless and is more of a toy without the software. Software is a collection of instruction which enables the user to interact with the computer or have the computer perform specific tasks. The computer software comprising the system software and application software is the force behind all the performance of the computer. The system software according to Okoroafor (2010) is a low level program that interacts with the computer at a very basic level. It includes operating software which runs the computer; utility that performs maintenance or general purpose chores; and compiler with which computer programs are created. The application software (a.k.a. end-user program) is designed to help perform a singular or multiple related specific tasks. Depending on the work it is designed for, an application can manipulate text, numbers, graphics, or a combination of these elements.

Internet/networking Competency

The Internet provides up-to-date information on a variety of topics on school administration unavailable from other sources. The content of textbook, library and principal's knowledge is enhanced by this medium. The Internet is a global information system that includes communication capabilities and many high level applications. The web is one of such applications. The existing connectivity of the internet according to Okoroafor (2010) made it possible for users and servers all over the world to participate in this activity. To participate fully and gain the benefits offered by the Internet and networking, the principals must acquire new set of skills – digital literacy. Pelgrum (2006) formulated that digital literacy is “process awareness, attitude and ability of constructive social action to appropriately use digital tools and facility to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expression and communicate with others in the context of specific life situations. With the mass of information available online, the ability to access, select and administer relevant data is considered a key competence. Digital literacy, meaning the constructive and critical application of ICT is the key to effective school administration. Proficiency in ICT also serves as a catalyst for literacy, numeracy, and many subject based competencies. Familiarity with the etiquette of text messaging, electronic mail, downloading and saving data, using different search engines are necessary internet/networking competencies for any principal. Gaps in online access and inadequate internet/networking competency on the part of the principals could have some severe implications on their administrative effectiveness.

ICT Safety Competency

ICT has been applauded for its numerous contributions to socio-economic development. Yet it must be acknowledged that ICT has been a force for bad and good and generated a whole set of issues. Baase (2002) explained that innovations in ICT has revolutionized how people buy and sell products, record, store, and playback media, communicate with others and many other aspects of life. Today many people rely on computer/networking to do homework, work, create or store useful information and communicate with others. Engaging in online activities entails sharing information with friends and strangers all over the world. Information transferred over

the network has a high security risk. To have positive Internet experience, it is important to develop protective behaviors to safeguard oneself, friends, family and properties while dealing with others online. In addition to the part of bridging the digital divide that has to do with giving people tools and training to access ICT, there is also need to build people's capacity to understand the basics of online safety and responsibilities. It is important that information transmitted over a network is handled and kept properly. Extremely important also is to protect computers from data loss, misuse and abuse. Business data, school records, credit card numbers and personal data must be adequately shielded from computer or computer network security risks when participating in online transactions. A computer security risk as defined by Deguzman (2007) is any action that could cause loss of information to software, data, processing incompatibility or damage to computer hardware. Feldman (2007) noted three important areas principals need to consider when using the Internet:

1. Know how to protect computer from viruses and spyware
2. Be aware of privacy issues related to networking and
3. Understand safety and security risks in participating online

In integrating ICT into education, the principals have as part of their responsibility, to ensure safety of all participants – students, teachers, and the school; as well as the safety of the ICT hardware and software. This demands a good knowledge of security risks and ethics in ICT usage. Principals need to be clearly informed about what and what not to do and where to go for help. They need to know why they do what they do and limit of their responsibility. Principals need ICT safety competencies to guard against inappropriate use of the technology both on their part, and in the part of teachers and students, school and technology hardware and software. With these skills, principals can prevent students from using public networking sites when they are in the classroom by monitoring and allowing use of specific sites.

Method

A descriptive survey design was adopted for the study. The study was carried out on a population 257 principals of public secondary schools in the six education zones of Anambra State. The instrument for data collection was a structured questionnaire adapted from Okoroafor (2010). It was originally subdivided into four groups with a total to 57 questionnaire items. It was reduced to three sections with 41 items for this particular study. The instrument was anchored on a four-point scale of Highly Needed, Needed, Fairly Needed, Not Needed. The respondents were expected to indicate the degree to which each of the items contained in the instrument is needed. A reliability coefficient of 0.71 was obtained using Cronbach alpha method. Mean was used to answer the research questions while t-test was used to test the hypotheses.

Results

Table 1: Mean ratings on computer operational competencies needed by secondary school principals for administrative effectiveness N=250

Items	Mean	Remark
1. Setting up system computer (CPU, monitor, keyboard and mouse	2.43	NN
2. Connecting and installing peripheral devices (printer, scanner, etc)	2.87	N
3. Start up and shut down computer	2.04	NN
4. Make backup copies of key applications and documents	2.63	N
5. Using self-help resources to diagnose and correct common hardware problems	2.97	N
6. Installing and upgrading an application	2.69	N
7. Identifying and using icons, windows and menus	2.34	NN
8. Starting an application, Creating and saving document using save and save as command.	2.54	N
9. Using printing options	2.65	N
10. Inserting and ejecting external storage drives (floppy, flash, CD Rom)	2.33	NN
11. Initializing, name/rename storage devices and folders	2.47	NN
12. Copying from hard disk to external storage drives and vice versa	2.55	N
13. Recognizing different file types and adjust file format for easy exchange	2.54	N
14. Effective use of Word processor e.g. MS word, word perfect	2.54	N
15. Effective use of Presentation software e.g. MS PowerPoint	2.58	N
16. Effective use of Spreadsheets eg. MS excel, Multiplan, super Calc	2.57	N
17. Effective use of Databases eg. Microsoft Access	2.66	N
18. Effective use of Desktop Publisher eg MS publisher, Ventura publisher, Adobe PageMaker	2.72	N
19. Effective use of Computer Aided Design eg. AutoCAD. ArchiCAD	2.70	N
20. Effective use of Computer Aided Manufacturing (CAM)	2.60	N
21. Effective use of Graphics design eg. Corel Draw, Adobe illustrator	2.66	N
22. Effective use of Control technology/robotics	3.00	N
Grand Mean	2.59	N

Key (N= Needed, NN= Not Needed)

The grand mean of 2.59 shows that the respondents need ICT operational competency. The item by item analysis indicates that the respondents need competency in 17 out of the 22 areas of computer operation listed. They include. Connecting and install peripheral devices (printer, scanner, etc), Making backup copies of key applications and documents, Use self-help resources to diagnose and correct common hardware problems, Install and upgrade an application, Starting an application, Creating and Saving document using save and save as command; Using printing options, Copying from hard disk to external storage drives and vice versa, Recognize different file types and adjust file format for easy exchange. Other include: Effective usage of Word processor e.g. MS word, word perfect, effective use of Presentation software e.g. MS PowerPoint, Effective usage of Spreadsheets eg. MS excel, Multiplan, super Calc, effective usage of Databases eg. Microsoft Access, effective usage of Desktop Publisher eg MS publisher, Ventura publisher, Adobe pagemaker, effective usage of Computer Aided Design eg. AutoCAD. ArchiCAD, Effective usage of Computer Aided Manufacturing (CAM), Effective usage of Graphics design eg. Corel Draw, Adobe illustrator, and In Effective usage of Control technology/robotics. Their mean ranges from 2.54 to 3.00.

Table 2. Mean ratings on internet/networking competencies needed by secondary school principals for administrative effectiveness N=250

	Mean	Remark
1. Evaluating and choosing a suitable connection method to access the Internet	3.20	N
2. Selecting suitable hardware and software needed for different network connection)	3.15	N
3. Lunching and using basic browser facilities for different browsers	2.55	N
4. Evaluating, choosing and using appropriate search engines	2.40	NN
5. Customizing browser settings to improve and maintain performance	2.86	N
6. Evaluating online information for relevance, bias, validity, reliability and sufficiency	2.34	NN
7. Using suitable techniques for easy search eg bookmarks & favorite	2.70	N
8. Creating websites and publish materials on the web	3.40	N
9. Creating and using e-mail account for exchanging information with others	2.45	N
10. Downloading and saving data – images, files, software & drivers	2.48	NN
11. Purchasing materials online	3.60	N
Grand Mean	2.83	N

Key (N= Needed, NN= Not Needed)

The grand mean of 2.83 in table 2 indicates that the respondents need internet/networking competency for administrative effectiveness. The item by item analysis shows that the

respondents need competency in eight out of the eleven areas of internet/networking that were listed. They include: competency in evaluating and choosing a suitable connection method to access the internet, selecting suitable hardware and software needed for different network connection, lunching and using basic browser facilities for different browsers, customizing browser settings to improve and maintain performance, using suitable techniques for easy search eg bookmarks & favorite, creating websites and publish materials on the web, creating and use e-mail account for exchanging information with others and purchasing materials online. Their mean ranged from 2.55 to 3.60.

Table 3. Mean ratings on ICT safety competencies needed by secondary school principals for administrative effectiveness N=250

	Mean	Remark
1. Recognizing ownership of digital information and guard against digital theft and plagiarism	3.50	N
2. Identifying and managing inappropriate/unwanted online contact	2.40	NN
3. Changing privacy settings to protect privacy and personal information online	2.75	N
4. Using antivirus and spywares to protect computer from network attacks – virus, Trojan horse, worm etc	3.40	N
5. Blocking students’ access to irrelevant websites and materials	3.00	N
6. Preventing opportunities for online abuse and exploitation	2.75	N
7. Preventing unauthorized network connections being created	2.48	NN
8. Applying safety principles in protecting the computer or network from virus attack eg. scan every incoming document/program before opening or running	2.80	N
Grand Mean	2.89	N

Key (N= Needed, NN= Not Needed)

The grand mean of 2.89 shows that the respondents need ICT safety competency. The item by item analysis shows the areas of ICT safety which the respondents need competency. They include: Recognizing ownership of digital information and guard against digital theft and plagiarism, Changing privacy settings to protect privacy and personal information online, Use antivirus and spywares to protect computer from network attacks – virus, Trojan horse, worm etc, Block students’ access to irrelevant websites and materials, Preventing opportunities for online abuse and exploitation, and in Applying safety principles in protecting the computer or network from virus attack. Their mean ranges from 2.75 to 3.50.

Discussion

Table 1 depicts that principals of secondary schools in Anambra state need competencies in 17 out of 22 computer operational competency areas listed. This is a clear indication that computer operational skills are core technical skills needed by every principal. More than half of the

competency areas in computer operation scored above 2.50 mean. This indicates that principals need this category of ICT competencies to be able to perform their administrative functions effectively. This result is not surprising since computer operational skills are pre-requisite to acquiring other ICT competencies. Almas and Nilsen (2006) observed that technical skills were the first step to acquire knowledge about ICT. The study of Williams et al (1998) revealed that even where educators have firm ideas of how technology can be applied in the school system, they were held back by lack of technical skills and knowledge.

The findings of this study is in contrast with the study of Saud (2005) who identified computer operating skills as the lowest computer technology educational needs of Malaysian teachers. Possibly, because teachers in Malaysia possess these skills already and need more advanced skills in ICT; whereas principals in Anambra state are yet to get acquainted with the rudiments of ICT (i.e. computer operational skills).

It was also found that principals needed 8 out of the 11 items listed under Internet/networking competency as displayed in table 2. The most favored Internet competency was purchasing materials online. Possibly, principals need this competency to access relevant educational materials from the web and communicate with colleagues on professional level. The finding of this study is in line with the study of Government of Western Australia (2005) which found that more than 56% of educators use ICT to communicate with colleagues and to access online research and best practices. This study also found accessing online research and best practices as the second top most needed teaching professional ICT competency. With the mass of information available online, the ability to access, select and administer relevant data is considered a key competence. Familiarity with text messaging, electronic mail, downloading and saving data are a vital competencies. Gaps in online access and inadequate ICT competence on the part of the principals could have serious repercussions and may hamper their administrative effectiveness.

The result in table 3 shows that principals needed 6 out of the 8 ICT safety competencies listed. The most needed competency was to recognize ownership of digital information and guard against digital theft and plagiarism. This is a clear indication of how serious the crime of plagiarism is in academic work. Protecting the computer from virus attack was also highly needed. This competency is important to protect computer from data loss. Deguzman, (2007) emphasized that it is important that principals and teachers know how to protect school records, personal data and credit card numbers from network security risks when participating in online transactions. Willard (1996) noted that ICT is best served by people who value individual freedom but recognize that freedom must be balanced by personal responsibility, respect for others and concern for the common good.

Conclusion

With respect of the findings of this study, it was concluded that principals of secondary schools in Anambra state need computer operational competency, internet/networking competency and ICT safety competency.

Recommendations

Based on the findings, it was recommended that Anambra State Ministry of Education, Post-Primary School service Commission, as well as association of principals should use the identified competency needs as basis for organizing workshops, conferences, seminars and in-service courses for their principals. This will help in improving principals' competencies in these areas.

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