INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SKILLS AND EFFICIENT MANAGEMENT OF EDUCATIONAL RESOURCES IN PUBLIC SECONDARY SCHOOLS

Ibien Eremie and Ugochukwu K. Agi
Ignatius Ajuru University of Education, Nigeria

Abstract

This study investigated information and communication technology (ICT) skills and efficient management of educational resources in public secondary schools in Rivers State, Nigeria. The study which adopted descriptive survey design was guided by two research questions. The 268 secondary school principals in Rivers State constituted the population. A sample of 255 principals which was 95% of the population was drawn through the stratified random sampling technique. A self-structured questionnaire titled: “ICT Skills and Efficient Management of Educational Resources Questionnaire (ICTSEMERQ)” was used for data collection. The instrument which contained 14 items was properly validated and the test retest method using Pearson’s Product Moment Correlation Coefficient Statistics for reliability testing yielded an ‘r’ value of 0.82. Percentages, mean and standard deviation were used to analyse the research questions. The study revealed that the ICT skills needed by principals include among others: knowledge of operating ICT devices, good knowledge of using ICT devices in teaching, ability to use ICT devices to store and retrieve information. The study also revealed that ICT skills enhance efficient management of educational resources through enhancing proper keeping of records, effective communication and proper accountability of educational resources among others. Based on the findings, conclusions were drawn and the following recommendations were made: Rivers State Ministry of Education in collaboration with secondary school’s management board should provide capacity building programmes to principals on ICT skills and principals should enroll themselves in institutions where they can obtain ICT literacy and utilization skills.

Keywords: Information, and Communication Technology (ICT), Efficient, Management, Educational Resources and Public Secondary Schools.

Introduction

Information and communication technology (ICT) skills are of great demand and significance in effective and efficient management of educational resources in the school system. The importance of ICT in the educational management is quite evident worldwide and especially in Europe and United States of America (Empirica, 2006). Governments are increasingly including the integration of ICT in education, enhancing infrastructure, and training human resources into national policies in order to develop their educational systems (UNESCO Institute for Statistics, 2010). It has impacted positively in teaching, learning, and research and school administration in a number of ways and based on the educational policy of governments, the aim is the complete utilization of ICT in teaching and management, which constitutes
the object and tool for better learning and execution of all school functions. The ICT has become one of the basic building blocks of a modern society and this has made it necessary for different nations to lay emphasis on understanding ICT and mastering the basic skills and concepts. The ICT devices are electronic devices used for information processing, education, administration, management, commerce, engineering, etc. With the possession of appropriate skills, ICT devices could be very useful in different human activities.

Acquiring ICT skills is a worthy asset that every school administrator must have if they desire to be effective and efficient in discharging his/her responsibilities. The aim of ICT integration is to improve and increase the quality, accessibility and cost-efficiency of the delivery of instruction to students, and it also refers to benefits from networking the learning communities to face the challenges of current globalization (Albirini, 2006). The findings of the 2009 meta-analysis paper indicate that teachers have a strong desire to integrate and integrate ICT in education, but they face numerous barriers and obstacles.

Efficiency refers to the relationship between the inputs in the educational system and the outputs from the system (Leigha & Benwari, 2011). It may also be explained as the quality or property of producing satisfactory results with an economy of effort and minimum waste of time and other valuables (Begg, Fischer, & Dornbusch, 2003; Fabunmi, 2004). In the school system, lead teachers and principals have the responsibilities of mobilizing the various resources (physical, human and material) needed for the attainment of school objectives. They equally ensure that these useful items are properly distributed and utilized. The ICT skills are very useful in this regard. It helps the school principals to properly analyse the situation of the school with regards to resource needs, mobilization and utilization in a very efficient manner.

Public secondary schools are post primary schools established and funded by state governments. In Rivers State, there are about 268 public secondary schools with 268 principals. This level of education consolidates and improves on the foundations already laid at the primary-school level. Secondary schools have the mandate of preparing their students for useful living within the society and for higher education. The state government invests heavily on this level of education through the supply of physical and human resources required for the attainment of these goals. Efficient management of these resources in public secondary schools’ aid reduction of wastage of resources and it also helps in cost management especially in a recessed economy like ours.

One of the relevant skills required in the efficient management of education resources in public secondary schools is ICT skills. Many principals are to acquire ICT skills or become computer literate. This affects their level of productivity through the negative impact that lack of ICT skills and literacy have on efficient management of educational resources. The researchers therefore considered it necessary to investigate the ICT skills required by public secondary school principals for efficient management of educational resources.

The Problem

The ICT devices are very useful in administration and management of educational resources in the school system. These ICT skills help school administrators to manipulate ICT devices in order to
achieve desired results. Most of the school principals are not computer literate and do not possess the skills for utilizing ICT gadgets for efficient management of educational resources. They need to change and embrace ICT and its innovations in the management of school resources.

In doing this, they need to take advantage of capacity building programmes organized for improvement of their managerial skills through ICT skills development. They also need to enhance the development of these skills by practicing on their own with the relevant ICT devices. The researchers are concerned by the low ICT skills of principals of public secondary schools in Rivers State. Hence, the problem of this study is to investigate the ICT skills needed by public secondary school principals in Rivers State for efficient management of educational resources. The purpose of this study is to investigate ICT skills and effective management of educational resources in public secondary schools in Rivers State, specifically to: 1) identify the ICT skills needed by principals for efficient management of educational resources in public secondary schools in Rivers State and 2) examine the ways that ICT skills enhance efficient management of educational resources in public secondary schools in Rivers State.

Theoretical Framework

This research work was based on the human capital theory (HCT) propounded by Adam Smith in 1776 and expanded by Harbinson in 1973. The theory states that the quality of skilled people in a country has significant impact on its economic growth and development (Oluwuo & Nwabueze, 2016). It is the attributes gained by a worker through education and training experiences. The HCT rests on the assumption that training of people will help to make them more productive. It draws people’s attention to how training can increase the performance of employees through equipping them with more information, ideas and skills. It believes that if the number of well-trained people increases, more will be produced and the society will become better.

Babalola (2003) was of the opinion that the contribution of manpower training to society building and advancement occur through training and schooling which help to enhance performance of the labour force. Training school principals on ICT skills will help to enhance their management abilities, efficiency and effectiveness required for higher output, and proper coordination of the activities of the human and material resources available in the school for optimum utilization.

Literature Review

Information and communication technology applications in education can be considered as an effective enabler to create access, store, transmit and manipulate different information in audio and visual form, due to the capability of ICT in providing proactive environment. Information and communication technology is the electronic means of facilitating the capture, storage, processing, transmission and display of information (Curtain, 2001). With the rapid rate at which ICT has evolved since mid-20th century, the integration of ICT reflects a strong role in education globally (Nwabueze, 2016). Schelin (2007) opines that ICT contribute effectively to the administration, coding, storage and processing of a huge amount of digital information created. Information and communication technology encompass many different things, and can address multitude challenges; in fact, to teach and to learn with ICT remains partially understood, and all its benefits are still not fully exploited (Cuban, 2003; Kirkwood, 2009). One of the roles of the
UNESCO Institute for Statistics (2010), which is the United Nation’s repository for statistics on areas mandated to UNESCO, is to contribute to benchmarking and monitoring the integration of and access to ICT in education through the establishment of internationally comparable and policy-relevant indicators. Ghavifekr, Afshari, and Salleh (2012) reported that many countries, including Malaysia, have formulated ICT strategies and policies for their education systems administration and management. Yusuf (2005) explains education as a discipline that has been influenced by ICT devices, which undoubtedly makes teaching, learning, school management and research more serious. Slonning (2000) acknowledges that the introduction of information technology updates many aspects of activities in the educational community. These ICT devices are necessary in educational development. Training on ICT applications and utilizations are part of human capacity building needs of secondary school principals for excellent management of educational resources. These ICT devices and ICT skills help school managers in communicating effectively with their teachers and parents; keep and present important information; as well as aide them in academic research and development.

Information and communication technology helps school managers in proper coordination of available school resources and effective service delivery. Information and communication technology devices useful to principals include: automated computers, internet cell phones, interactive multi-media, digital tools for schools’ development, projectors, compact discs, flash drives, telescopes, magnetic boards, and interactive boards. Although ICT has been introduced into the education system, the result of many studies has shown that integration has encountered with resistance and barriers. These studies include: Shahbaz’s (2006) research in ICT use in secondary schools in Isfahan; Toprakci (2006) research on ICT integration in schools, according to the viewpoints of teachers and managers in the elementary and secondary schools of Turkey; Drent and Meelissen (2007) research on the use of information and communication technology in the school curriculum, etc.

Opara and Ituen (2009) stated that ICT targets in Nigeria include: eliminating boundaries of information and communication sharing across the globe; fostering and ensuring fast, reliable and unrestricted information and communication across the globe; providing a common platform for interaction of cultures and traditions of the various people of the world; presenting the same opportunities for everybody to share ICT’s resources; bringing about a centralized information bank, a data base for everyone which will always be geared towards promoting research and national development; making ICT available and accessible to Nigerians; aiding Nigerians to participate in global information society; improving service delivery; encouraging indigenous content and vibrant involvement in World Wide Web; and fostering interactive communication in Nigeria via the recent numerous social network facilities for a more viable social engineering of the country. One example is the Facebook application.

In schools, ICT is the technological medium through which educational activities and control of resources are enhanced. According to Madumere-Obike, Ukala, and Nwabueze (2015), certain skills are required for one to take advantage of ICT. The principal requires the following skills which are the modern procedures in educational development. They are needed for managerial effectiveness. The ICT skills needed include: understanding of ICT application, social networking, internet browsing to source for...
information, virtual presentations at conferences, oral presentation of papers on power point, and how to keep and bring information from the computer. ICT piques principals’ interest in their job through new media and innovations in their field which can enhance their preparation for work.

The concept of efficiency refers to the relationship between the inputs in the educational system and the outputs from the system (Leigha & Benwari, 2011). It may also be explained as the quality or property of producing satisfactory results with an economy of effort and minimum waste of time and other valuables (Fabunmi, 2004). Efficiency is demonstrated by the observed ratio of the useful output to the total input in any identified system (political, economic, manufacturing, educational, etc.). According to Roa, (2007), an educational system is said to be efficient when maximum output is obtained with minimum possible inputs. Efficient management of educational resources is concerned with proper coordination of the spread and usage of school items for greater output and less wastage.

Afshari, Ghavifevr, Siraj and Ab Samad (2012) opine that as an administration head, school principals should have basic skills of using ICT in school daily administrative and management tasks. In the school system, principals have the responsibilities of mobilizing the necessary resources (physical, financial, and human) needed for the attainment of school objectives. They equally ensure that, these useful items are properly distributed and utilized. They require some skills that will aid them, especially ICT and professional skills that are acquired through training. These skills help principals to properly analyze the situation of the school with regards to resources needs, mobilization and utilization in a very efficient manner. The physical resources provided and utilized are: school buildings, desks, chairs, tables, lockers, school vehicles, laboratory facilities, library facilities, instructional materials, etc. These resources are not adequately available, and those resources that are available must be properly managed. Adequate management of these resources involves maintenance and control of their utilization.

The Organisation for Economic Co-operation and Development’s (OECD) (2017) view on funding of school education, financial resource is very important in the management of secondary schools. Money is needed in the accomplishment of numerous projects and programmes in public secondary schools. Financial resources are highly limited in supply. Therefore, available funds are required to be prudently and carefully managed for better output. Adequate control of money belonging to the school demands that proper account of what funds are used for should be provided. Efficient decisions should be reached on how to utilize funds and adequate follow-up is carried out once decision on how to utilize money is made, especially when such money has been released. Haddad (2002) focuses on the operational and financial benefits brought about by the introduction of ICT in the educational organization and management. Pfaff and Simon (2002) also emphasize the cost reduction due to limited disposal of printed material.

Methodology

The study which used descriptive survey research design was guided by two research questions:

1. What are the ICT skills needed by principals for efficient management of educational resources in public secondary schools in Rivers State?
2. What are the ways ICT skills enhance efficient management of educational resources in public secondary schools in Rivers State?

The population of the study constituted of 268 public secondary school principals in Rivers State. A sample of 255 principals was drawn through the stratified random sampling technique. This represented 95% of the population. A questionnaire instrument designed by the researcher entitled “ICT Skills and Efficient Management of Educational Resources Questionnaire (ICTSEMERQ)” was used for data collection. The instrument which contained 14 items was properly validated and the reliability test using test-retest process and Pearson’s Product Moment Correlation Coefficient Statistics was 0.82. The instrument was structured in line with the modified four (4) point Likert Rating Scale of Strongly Agreed (4 points), Agreed (3 points), Disagreed (2 points) and Strongly Disagreed (1 point).

Table 1
Statistical analysis of ICT skills needed by principals for efficient management of educational resources in public secondary schools in Rivers State.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Mean</th>
<th>S.D</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Knowledge of operating ICT devices is part of the ICT skills needed by principals for efficient management of educational resources in public secondary schools.</td>
<td>150</td>
<td>71</td>
<td>9</td>
<td>10</td>
<td>3.18</td>
<td>1.38</td>
<td>Agreed</td>
</tr>
<tr>
<td>2.</td>
<td>Good knowledge of using ICT devices in teaching is part of the ICT skills needed by principals for efficient management of educational resources in public secondary schools.</td>
<td>172</td>
<td>49</td>
<td>9</td>
<td>10</td>
<td>3.30</td>
<td>1.29</td>
<td>Agreed</td>
</tr>
<tr>
<td>3.</td>
<td>Clear skills of manipulating ICT devices for research development is part of the ICT skills needed by principals for efficient management of educational resources in public secondary schools.</td>
<td>168</td>
<td>63</td>
<td>9</td>
<td>-</td>
<td>3.43</td>
<td>1.16</td>
<td>Agreed</td>
</tr>
<tr>
<td>4.</td>
<td>Ability of using ICT devices to store data is part of the ICT skills needed by principals for efficient management of educational resources in public secondary schools.</td>
<td>166</td>
<td>55</td>
<td>9</td>
<td>10</td>
<td>3.37</td>
<td>1.21</td>
<td>Agreed</td>
</tr>
<tr>
<td>5.</td>
<td>Ability of using ICT devices to retrieve data is part of the ICT skills needed by principals for efficient management of educational resources in public secondary schools.</td>
<td>155</td>
<td>56</td>
<td>9</td>
<td>20</td>
<td>3.38</td>
<td>1.32</td>
<td>Agreed</td>
</tr>
</tbody>
</table>
Results

Research Question One: What are the ICT skills needed by principals for efficient management of educational resources in public secondary schools in Rivers State?

The results in Table 1 show that the mean scores of all the items were well above the criterion mean score of 2.50. This indicates that all the ICT skills considered were needed by 93.3% of the principals for efficient management of educational resources in public secondary schools. Clear skills of manipulating ICT devices for research development (item 3) ranking first. The aggregate mean score of 3.32 for principals showed that majority of the principals agreed on the ICT skills needed for efficient management of educational resources in public secondary schools to include: knowledge of operating ICT devices, good knowledge of using ICT devices in teaching, clear skills of manipulating ICT devices for research devices to retrieve data, using ICT devices to present information and clear ability of connecting relevant individuals or agencies with ICT devices.

Research Question Two: What are the ways ICT skills enhance efficient management of educational resources in public secondary schools in Rivers State?

Table 2 showed the various ways ICT skills enhance efficient management of educational resources. All the items had mean scores that far exceeded the criterion mean score with ICT skills enhance effective communication in the school system for efficient management of educational resources through the use of ICT devices (items 3) ranking first and it is thus considered the most important way ICT skills enhance the efficient management of educational resources in public secondary schools in Rivers State. The aggregate mean score of 3.18 shows that majority of principals (95.4%) agreed on the ways ICT skills enhance the efficient management of educational resources in public secondary schools in Rivers State. Therefore, the ways ICT skills enhance efficient management of educational resources in public secondary schools in Rivers State include: ICT skills enhance the coordination of educational resources, ICT skills enhance proper keeping of records, ICT skills enhance effective communication, ICT skills enhance proper accountability, ICT skills enhance better utilization of ICT devices, ICT skills enhance efficient management of educational resources through the installation and maintenance of relevant ICT security devices and through proper utilization of ICT devices in sourcing for information useful for the
Table 2  
Statistical analysis of the ways ICT skills enhance efficient management of educational resources in public secondary schools in Rivers State.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>Mean</th>
<th>S.D</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ICT skills enhance the coordination of education resources in public secondary schools through the use of ICT devices.</td>
<td>168 (70.0%)</td>
<td>58 (24.2%)</td>
<td>14 (5.8%)</td>
<td>-</td>
<td>3.02</td>
<td>1.47</td>
<td>Agreed</td>
</tr>
<tr>
<td>2.</td>
<td>ICT skills enhance proper keeping of records for efficient management of educational resources through the use of ICT devices.</td>
<td>145 (60.4%)</td>
<td>86 (35.8%)</td>
<td>9 (3.8%)</td>
<td>-</td>
<td>3.34</td>
<td>1.29</td>
<td>Agreed</td>
</tr>
<tr>
<td>3.</td>
<td>ICT skills enhance effective communication in the school system for efficient management of educational resources through the use of ICT devices.</td>
<td>153 (63.8%)</td>
<td>78 (32.5%)</td>
<td>9 (3.8%)</td>
<td>-</td>
<td>3.40</td>
<td>1.21</td>
<td>Agreed</td>
</tr>
<tr>
<td>4.</td>
<td>ICT skills enhance proper accountability of educational resources in the school system through the use of ICT devices.</td>
<td>150 (62.5%)</td>
<td>65 (27.1%)</td>
<td>15 (6.3%)</td>
<td>10</td>
<td>3.12</td>
<td>1.37</td>
<td>Agreed</td>
</tr>
<tr>
<td>5.</td>
<td>ICT skills enhance better utilization of ICT devices and efficient management of such resources.</td>
<td>160 (66.7%)</td>
<td>71 (29.6%)</td>
<td>9 (3.8%)</td>
<td>-</td>
<td>3.25</td>
<td>1.36</td>
<td>Agreed</td>
</tr>
<tr>
<td>6.</td>
<td>ICT skills enhance efficient management of educational resources through the installation and maintenance of relevant ICT security devices.</td>
<td>151 (62.1%)</td>
<td>80 (33.3%)</td>
<td>9 (3.8%)</td>
<td>-</td>
<td>3.24</td>
<td>1.30</td>
<td>Agreed</td>
</tr>
<tr>
<td>7.</td>
<td>ICT skills enhance efficient management of educational resources through proper utilization of ICT devices in sourcing for information useful for the maintenance of educational resources.</td>
<td>174 (72.5%)</td>
<td>66 (27.5%)</td>
<td>-</td>
<td>-</td>
<td>2.90</td>
<td>1.48</td>
<td>Agreed</td>
</tr>
</tbody>
</table>

Aggregate Mean of Standard Deviation: 3.18

Discussion

This research work considered seven ICT skills that are required of principals for effective management of educational resources in public secondary schools in Rivers State. The results of the analysis showed that majority of the principals considered all the seven ICT skills necessary, with a few differing. These ICT skills include: knowledge of operating ICT devices, good knowledge of using ICT devices in teaching, clear skills of manipulating ICT devices for research developments, ability of using
ICT devices to store data, ability of using ICT devices to retrieve data, ability of using ICT devices to present information and clear ability of connecting relevant individuals or agencies with ICT devices.

Principals of public secondary schools in Rivers State will benefit from trainings on these ICT skills in order to improve their service delivery. These ICT skills are highly needed in today’s world. It brings the whole world together and opens up many windows to access information with little expense. Knowledge of manipulation of ICT devices is useful in the efficient management of educational resources. As revealed by the study, ICT skills enhanced the coordination of educational resources, it enhanced proper keeping of records, effective communication, proper accountability, ICT skills enhanced better utilization of ICT devices installation and maintenance of relevant ICT security devices and utilization of ICT devices in sourcing for information useful in the management of educational resources.

These findings agreed with Nwokedi, Amaewhule and Nwafor (2018), Nwabueze and Ukaigwe (2015) and Ezekiel (2016). These authors in their various research works identified ICT skills scholars need and the relevance of these skills in the administration of schools. Possession of ICT skills will enhance principals’ abilities to exchange information among themselves, their teachers and parents of their students. ICT skills enhance better management of educational resources available to school managers. They save time and cost. For instance, if the principal wants to pass some information to parents, bulk SMS could be used, because it is cheaper and faster than printing newsletters.

Relevant information about the school can be stored in the system or made available in the school website. This makes accessibility to such information faster. ICT skills will make it easier for principals to collaborate schools’ board, ministry of education and other relevant agencies and stakeholders in education. According to Oboegbulem (2008), ICT skills enhance proper accountability in the school system. It helps the principals to maintain good records of educational resources provided to them by the government. Therefore, these ICT skills are very relevant in school administration and should be provided to principals to enhance their efficiency and effectiveness in the discharge of their duties.

**Conclusion**

The usefulness of information and communication technology (ICT) has cut across every discipline. Everybody, including school principals, are advised to take advantage of ICT by acquiring ICT manipulative skills. Without the possession of ICT skills, it will be difficult for anybody to utilize ICT devices and enjoy the advantages that come with them.

ICT skills enhance the management of educational resources (physical, human and financial resources) provided for effective administration of schools. It is useful in storage and retrieval of information necessary for planning and decision making, effective communication and inventory keeping. The importance of ICT skills in the management of educational resources cannot be over emphasized. It is therefore very important for every principal in the public secondary schools in Rivers State to acquire these skills.

**Recommendations**

The following recommendations are suggested, based on the findings of the study:
1. Rivers State Ministry of Education in collaboration with Secondary Schools’ Management Board provide capacity building programmes to public secondary school principals on information and communication technology (ICT) skills.

2. Public secondary school principals in Rivers State enroll themselves in institutions or organization where they can obtain ICT literacy and utilization skills without waiting for government.

References


Toprakci, E. (2006) Obstacles at integration of schools into information and communication technologies by taking into consideration the opinions of the teachers and principals of primary and secondary schools in Turkey. *Journal of Instructional Science and Technology (e - JIST)*, 9, 1-16.

Authors

Ibiene Eremie and Ugochukwu K. Agi, PhD, are members of the Department of Educational Management Faculty of Education at Ignatius Ajuru University of Education, Nigeria.