

**INFORMATION COMMUNICATION TECHNOLOGY
RESOURCES AND LEARNING OUTCOME OF
SECONDARY SCHOOL STUDENTS IN ONDO STATE,
NIGERIA**

BY

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Abstract

This study was set to investigate the Impact of Information Communication Technology resources and learning outcome of secondary school students in Ondo State, Nigeria. Thirty public secondary schools and thirty private secondary schools, thus a total of 1200 students after stratification were randomly selected for the study. A self constructed and validated Questionnaire was used for data collection. The title is, Impact of ICT on Educational Resources and Learning Outcome Questionnaire" (ICTERLOQ). This was validated and subjected to reliability of $r = 0.76$. Data were analyzed using descriptive statistics and oneway ANOVA to answer questions raised and hypotheses formulated in the study. The findings showed that there is a positive and significant relationship between availability of ICT resources and learning outcomes in Ondo State secondary schools ($r = .999$, $P < 0.05$). It was also revealed that that there is no significant difference in the provision of ICT resources and learning between private and public secondary schools in Ondo State ($t(1,199) = .002$; $P > 0.05$). The study discovered that there are challenges of fund for ICT provision and maintenance to aid learning outcome in Ondo State secondary schools. In view of the findings, recommendations were made to help improve the financing of ICT resources in public and private secondary schools. There should be urgent need for an inter-sectoral budget restructuring to release more resources for education. This will go a long way in meeting both students and teachers requirement for effective service delivery in improving the school system effectiveness and efficiency.

Keywords: Investment, Dilapidated structures, poor funding, ICT gadgets, Purchasing Power Parities (PPP\$) of money, sectoral budget restructuring.

Introduction

Education is a potent weapon in the arsenal of any country in pursuit of national development. Thus, most developed societies over the countries have invested enormous amount of time, energy and money in providing a qualitative education to their citizen (Oyetakin and Kayode, 2010). It is necessary to note that the educational standards set up for the school must be challenging to meet the needs of the students and the society in this era of globalization through sufficient funding for the provision of information communication technology gadgets that could make the provision of education to be potent for a true and sustainable development society.

Many countries in the world view education as a good investment for national development because it is expected to

produce the required quantity and quality of human resources for the engine of economic growth. The importance of education to human beings cannot be over emphasized. Education is a human right that should be accorded to all human beings solely by reason of being human (UNESCO, 2010). The right to education is enshrined in many international human rights covenants including the Convention on the Right of the Child (CRC) and the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). The utmost goals attached to education in Nigeria were clearly underscored in the National Policy on Education (Federal Government of Nigeria FGN, 2004). As a result of this, all effort are put together to the system in order to realize the goals.

Information communication technology (ICT) education faces a lot of challenges in Nigeria, thus, making it difficult for a good quality ICT education that is empowers and capable of bringing about sustainable development to the country. It is necessary to point out that in Nigeria, the greatest challenge facing education is inadequate funding by Federal, State and Local Governments, to the extent that funding has been in response to conditionality imposed by International Financial Institutions (IFIS) Nigeria (Igbuzor, 2006). Hence, poor funding has been linked to ineffectiveness and inefficiency of both human and material resources in the education sector of the country.

The state of infrastructural decay in many secondary schools in Nigeria is a manifestation of poor funding of the system. Ahmed (2003), revealed that, in most of the nation's secondary school, teaching and learning takes place under unconducive environment, lacking the basic materials and thus hindering the fulfillment of educational objectives.

Nevertheless, education constitutes the strong base of industrial development in Ondo State, Nigeria since its creation on 3rd February, 1976; education has been attracting the largest proportion of the total money earmarked for social service. Of all the level of education in the State, secondary school has been consuming a lion share of the total money earmarked for education (Aijejunsule, 2001).

State of Education Funding and Information Communication Technology in Nigeria

The state of education in any society is a combination of many factors, including the resources committed to the educational sector and quality of personnel assigned to manage the system. The importance and linkage of education to the development of any society is well known. It is in recognition of this importance that the international community and governments all over the world have made commitments for citizens to have access to education (Igbuzor, 2006). It has been said that no nation can develop beyond the level of its education. In other words, education is the live wire of any serious nation which aspires to attain the highest level of development. The state of education in Nigeria largely explains the high level of development in the country's educational system. Information Communication Technology (ICT) resources inadequacy has long been a central factor in chronic education shortcomings and this was supported by Agabi (2010) who asserted that the state of resources provided for the execution of education programmes are inadequate and irregular in Nigeria.

Findings from an ongoing educational sector analysis confirm the poor state of education in Nigeria. The national literacy rate is currently 57 percent. About 49 percent of the

teaching forces are unqualified. Access to basic education is inhibited by gender issues and socio-cultural beliefs and practices, among other factors (Odukoya, 2003). Wide disparities persist in educational standards and learning achievements. The system emphasizes theoretical knowledge at the expense of technical, vocational and entrepreneurial education which is better powered by ICT to meet global standard.

According to Dike (2006), lack of funding, lack of teaching tools and modern classrooms, poor remuneration and acute shortage of qualified teachers contribute to the falling standard of education in Nigeria. It is no longer news that the percentage of federal budgetary allocation to education has been dwindling (Ibukun, Oyetakin, and Akinfolarin (2012).

Oyetakin (2011) in a study on cost of secondary education, submitted that the summation of recurrent and capital expenditure from the percentages allocated to the education sector were: 6.4%; 5.4%; 7.9%; 4.4%; 3.9%; 5.1%; and 3.3% in 1984, 1985, 1986, 1996, 1997, 1998 and 1999 respectively. This shows that fund allocation to education decreased between 1984 and 1985 (6.4%, 5.4%), but rose to 7.9% in 1986. It fell further to 4.4% and 3.9% in 1996, but with the least percentage fund allocation of 3.3% in 1999. This trend did not improve from the 2006 with 11.05%, 2007 (8.09%), 5.8% in 2009, 6.16% in 2011 and 8.42% in 2012.

The condition becomes more pathetic when Nigeria's Gross National Product (GNP) allocation to education is compared with those of less affluent African nations that allocate greater percentage (See table 1).

Table 1
Spending on Education (% GNP) for some African Countries as compared to Nigeria

Country	GNP (%)
Coted' Ivoria	5
Kenya	6.5
Angola	4.9
Ghana	4.4
Malawi	5.4
Nigeria	0.76
Mozambique	4.1
South Africa	7.9
Tanzania	3.4
Uganda	2.6

Source: Wikipedia-Jubilee 2000

The statistics in table 1 shows how insufficient Nigeria's allocation to the education sector is 0.76% and is the least in ranking when compared with other countries. This situation transform to ICT procurement and thus creating a great challenge to learning outcome in secondary schools.

It is necessary to note that ICT gadgets are classified under the capital expenditure of the Government while its maintenance goes to the recurrent expenditure section. Thus, the pattern of fund allocation in the education budgets across the years show clearly the low capital expenditure that was actually spent on secondary education as revealed in a study by Oyetakin (2008) that in the year 1999 was ₦560, 888,506 (32.6%) and ₦294, 622,619 (17.42%) in year 2000. Capital cost attracted ₦630, 260,159.70 (31.59%) in year 2001, while ₦117, 012,837.98 (1.78%) was spent on capital projects in 2002. Also, in the 2003

financial year, ₦76763426.54 (1.66%) was released for capital projects. An increase of ₦86, 431,203.00 (7.54%), ₦1, 184,931,860.00 (9.04%) and ₦4, 880,320,000 (26.15%) was expended in year 2004, 2005 and 2006 respectively. This situation remains as revealed by table 2.

Table 2
Federal Government of Nigeria Budget Allocation for Education as Proportion of Aggregate Budget Expenditure 2009 -2013 (N Billion)

Year	Total Budget	Capital Exp.	Recurrent Exp.	Education	% Aggregate
2009	2,726.28	40.01 (17.8%)	184.67 (82.2%)	224.68	8.2
2010	4,079.65	53.67 (21.6%)	195.42 (78.4%)	249.09	6.1
2011	4,508.48	51.83 (14.5%)	304.67 (85.5%)	356.50	7.9
2012	4,648.85	54.65(15.3%)	342.73 (84.7%)	397.38	8.5
2013	4,987.22	71.94(17%)	360.82 (83%)	423.76	8.5

Source: (Oyetakin, 2014:117)

Table 2, suggests that during the five-year period the annual budget for the education sector has remained at between 6.1% and 8.5% per annum. For adequate funding of information technologies, the trend of annual capital expenditure of about 1/5th of the recurrent expenditure need be addressed by the budgetary allocations since it negates the UNESCO Institute for Statistics (2008) position that the real value of educational investments by governments and families should reflect the 'Purchasing Power Parities (PPP\$) of money. Table 2 is depicted in figure 1 below.

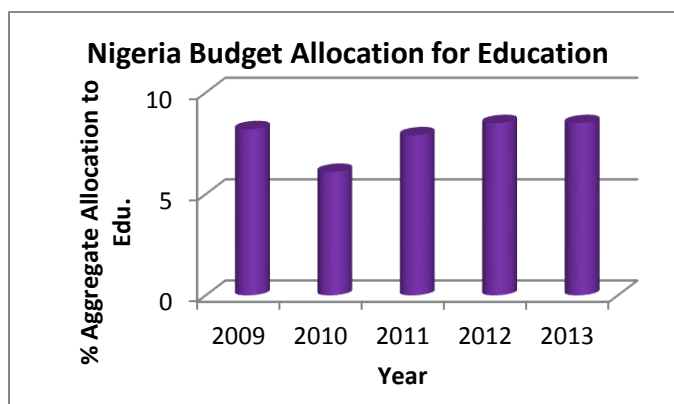


Figure 1: Federal Government of Nigeria Budget Allocation for Education as Proportion of Aggregate Budget Expenditure

A cursory look at the budgetary allocation to education in Ondo State did not show a difference in the dwindle trend from that of the country as revealed in table 3.

Table 3
Ondo State Total Budgetary Allocations to Education and their Percentages of Total Budget Allocations in Ondo State

Year	Total Budget	Allocation to Education	% of Total Education
2000	60.4	512.4	8.48
2007	63.7	547.2	8.59
2008	82.3	713.4	8.67
2009	84.98	720	8.47
2010	124.37	7.7 (billion)	6.19
2011	138.5	12.4 (billion)	8.95
2012	150	12.198 (billion)	8.13

Source: Ondo State Ministry of Finance and Budget

It can be deduced that the variation in the budgeted funds and actual money disbursed had an effect on all sectors of the State including Secondary Education.

Education in itself is the transmission of information from one medium to another whereas communication according to Thompson and Cat-Basil (2003) is described as a message or signal that reduces the uncertainty in the mind of the receiver. However, technology is a key component in achieving effective transmission of information and communication. The knowledge and the processing of information are the key drives for wealth creation, social and economic development .

Statement of the Problem

The issue of funding education is one of the major problem facing the development and efficiency of educational resources especially the enormous fund required in the provision and maintenance of ICT gadgets and learning outcome in Secondary Schools. Inadequate funding for the rehabilitation of dilapidated structures, equipments of libraries, technical and computer/ICT laboratories constitute a problem on the qualitative discharge of educational objectives through ICT. The inability to motivate teaching and non-teaching staff to work with ICT mode of education through, remunerations, training and development as at when due is thus identified as a problem. Hence, the funding of the access to ICT mode of education and the learning outcomes is facing crucial challenges of meeting the ever-increasing students' enrolment in Public Secondary Schools in Ondo State.

Research Questions

The study is designed to answer the following specific questions;

1. What is the level of ICT resources available in Secondary Schools in Ondo State?
2. Of what impact are these available ICT educational resources to students' learning outcome in Secondary Schools in Ondo State?

Research Hypotheses

The following hypotheses were formulated and tested:

1. There is no significant relationship between the use of ICT resources and learning outcome in Ondo State secondary

schools.

2. There is no significant difference in the provision of ICT resources and learning outcome between private and public secondary schools in Ondo State.

Methodology

Design

Descriptive research design of survey type was used.

Sample and Sampling Techniques

The population for the study is made of the entire students in the three senatorial districts (North, South, and Central) with three hundred and four Public Senior Secondary Schools (304) and two hundred and eighty (280) Private Secondary Schools spread across the eighteen Local Government Areas in Ondo State. From which the sample consisted of 30 public secondary schools and 30 private secondary schools with 20 secondary school students from each school. The overall participants cut across 1200 different categories of students of the sampled schools.

Instrumentation

The instrument for the study consisted of a self designed questionnaire titled, "Impact of ICT on Educational Resources and Learning Outcome Questionnaire" (ICTERLOQ). This was validated and subjected to reliability of $r = 0.76$.

RESULTS

Research Questions

The study to answer the following specific questions:

1. What is the level of ICT resources available in Secondary Schools in Ondo State?

Table 4

Summary of the Availability of ICT Resources in Secondary Schools in Ondo State

Senatorial Districts	(Public)		(Private)	
	Mean	S.D	Mean	S.D
North	3.02	1.23	3.68	1.45
Central	4.11	2.01	4.56	2.37
South	2.34	1.02	2.32	1.01
Average	3.16	1.42	3.52	1.61

Source: Fieldwork

The result from table 4 shows that private secondary schools had a higher aggregate mean of 3.52 and SD of 1.61, while the public secondary schools had a mean of 3.16 and SD of 1.42 across the three senatorial districts of Ondo State.

2. Of what impact are these available ICT educational resources to students' learning outcome in Secondary Schools in Ondo State?

Table 5
Summary of Available of ICT Resources and Learning Outcomes of Public and Private Junior and Senior Secondary Schools in Ondo State (2009-2013)

Year	Learning Outcome				Availability of ICT Resources			
	(Junior)		(Senior)		(Junior)		(Senior)	
	A	B	A	B	A	B	A	B
2013	42.00	91.4	78.8	90.9	55.28	67.40	52.00	80.60
2012	40.20	89.0	73.3	86.3	69.36	74.20	50.00	70.00
2011	38.40	84.11	74.8	82.7	55.92	81.60	54.67	79.80
2010	36.42	81.44	62.3	73.6	47.23	78.00	66.00	91.20
2009	35.16	75.44	64.5	67.4	43.80	83.80	64.33	86.90
Ave.	31.24	84.28	70.74	80.18	54.32	77.00	57.40	81.70

A= Public, B = Private

Source: Fieldwork

A cursory look at table 4, from 2009 to 2013 shows that an average mean of 31.24 learning outcome was recorded for junior public secondary school while 84.28 was recorded for junior private secondary school. When compared with the availability of ICT resources, the private rated higher with 77 which is also reflected in the students' learning outcome which is higher than that of public with a mean rating of 54.32 in learning outcome. This situation was repeated in the senior secondary schools where the learning outcome was higher in private with 80.18 than the public which has 70.74. This trend is also reflected in the learning outcome with the private senior secondary having a mean of 81.70 higher than public with 57.40. This situation portrays a relationship in the availability of ICT resources and learning outcome between public and private senior and junior secondary schools in Ondo State.

Testing Research Hypotheses

Hypothesis One

There is no significant relationship between the use of ICT resources and learning outcome in

Ondo State secondary schools.

Table 6
Summary of Correlation Analysis on the Use of ICT Resources and Learning Outcome in Ondo State Secondary Schools

Variables	N	Mean	SD	r-cal	r-tab	Decision
ICT Resources	1200	68.40	17.27			
Learning Outcomes	1200	1.50	.51	.999	.275	*

* correlation coefficient is significant at 0.05 level

The result of the test performed indicates that there is a positive and significant relationship between availability of ICT resources and learning outcomes in Ondo State secondary schools ($r = .999$, $P < 0.05$). This implies that the hypothesis which states that there are any significant relationship between the use of ICT resources and learning outcome Ondo State secondary schools is rejected.

Hypothesis Two

There is no significant difference in the provision of ICT resources and learning outcome between private and public secondary schools in Ondo State.

Table 7
Difference Among the Means of Provision of ICT Resources and Learning Between Private and Public Secondary Schools in Ondo State

Source	N	Mean	SD	Df	t-cal	t-val	Decision
Public	600	68.41	19.50				
Private	600	68.40	15.22				
				1,199	.002	.256	NS

NS= Not Significant at 0.05 level (2-tailed)

Table 7 shows the t-test analysis of the scores based on provision of ICT resources and learning outcome between public and private secondary schools in Ondo State. The result shows that there is no significant difference in the provision of ICT resources and learning between private and public secondary schools in Ondo State ($t(1,199) = .002$; $P > 0.05$).

Discussion

The financing inadequacy and imbalance in the system corroborate Agabi (2010) submission that, the Ondo State resources provision for the execution of educational programmes is inadequate and irregular. Adequate supply of ICT resources improves the learning outcome of secondary school students as corroborated by Abdulkareem (2010), that, relevant and adequate resources supplied to schools at the right time enhance the implementation of educational objectives.

The result shows that availability of educational resources has significant relationship with students learning outcome. It is not possible to deliver effective education without some level of relevant resources. This was also highlighted by Nchor (2000) in Agabi (2010), that, instructional resources provide a solid basis for conceptual thinking; increase the propensity of the brain to retain information; make learning more interesting; and take care of differences that may exist among learners. Resources are not equally provided by public and private secondary schools. Inadequate and outdated ICT gadgets are used.

Conclusion

From the analysis of the findings, the secondary schools in Ondo State are suffering from adequacy of ICT resources. Most educational resources present in the selected schools are not functioning properly which has implication on learners' learning outcome. The project of ICT education is thus supposed to be the promise of the future in any society. Given the poor state of the country's financing of education resources, the research work

reviewed that current funding trend might not be sustained in the nearest future.

There is therefore the need to increase public spending to the sector, employment of qualified teachers to be in the right proportion with the number of students, provide necessary tools which will improve the quality of teaching, make education relevant to the needs of the students and the society by providing the right curriculum and assessment methods and employment of right managers to ensure quality.

Recommendations

Therefore, the following recommendations are given:

1. There should be urgent need for an inter-sectoral budget restructuring to release more resources for ICT education in Ondo State. This will go a long way in meeting both students and teachers requirements for effective service delivery in improving the school system efficiency.
2. Relevant and adequate resources that will give a back-up to information and communication technology advancement must be supplied to schools at the right time.
3. Government, stakeholders and proprietors of schools should set aside substantial amount of money for provision and maintenance of ICT gadgets.
4. It is also recommended that there should be different forms of training programmes such as seminar, workshop in which adequate knowledge on utilization and maintenance of ICT to improve productivity. This will assist in putting the resources into effective usage. Experts in the use of particular resources can be invited to teach others.
5. Regular maintenance and improvement services should also be conducted in order to enhance quality performance and durability of the ICT equipments.
6. Finally, it is recommended that a holistic approach to resource management should be adopted. This is to ensure that provision, utilization, maintenance and improvement efforts on the resources are adequately given attention in the management process.

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