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Integrating Information Communication Technology (ICT) into Secondary School Teaching Process in Nigeria

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Abstract

The problem of Information and Communication Technology (ICT) teaching, availability, utilization, evaluation and policy implementation among public secondary schools in Nigeria has been a subject of concern to stakeholders. Nigeria joining the global ICT scramble has formulated policies that ensures ICT an examinable subject at the Senior Secondary School level in Nigeria. The process of implementing this new policy is of interest to this study which investigated the integration of ICT teaching into Nigerian secondary schools teaching process. The survey research design which drew four research questions and two hypotheses was adopted. The total population consisted of secondary schools in Oyo state with Ibadan North Local Government Area sampled. Simple random sampling technique was adopted to select 15 out of the 47 secondary schools and 172 teachers as respondents. An instrument titled 'ICT integration and teaching process Questionnaire' (ICTITQ $r=0.61$) was validated by colleagues in the Faculty of Education of the University of Ibadan.

Findings indicated that a significant relationship existed between Availability of ICT resources and ICT teaching process with $r=0.0118$; $p<0.05$ while Teacher quality and students learning outcome in ICT teaching process did not give a significant result $r=0.089$; $p<0.05$. The study recommended that more ICT teacher specialist be recruited and also there should be provision of in-service and refresher courses for serving teachers.

Keywords: ICT Availability, Teaching Quality, Teaching Process

Introduction

In recent years Information and Communication Technologies (ICT) has taking a centre place in global affairs. The ICT has become the wonder of the 21st century as it has virtually surmounted almost any known barrier in effecting communications. An important fact about the ICT is that it is useful and applicable to all professionals. Constitution of the ICT is quite large ranging from simple Technology acquisition to skills acquisition and utilization. Several authors and authorities have tried to describe ICT (Nwankwo, 1985; Aiyekpeku 1982; 1993; Haag, Cummings and Dawkins 2000; Babalola, 2010) and a host of other scholars see the ICT as a modern way of accomplishing tasks using simple technologies that communicate with the speed of light. Such communications over the years have required the use of various methods. Another important composition of the ICT is the arrival of the internet. Beginning from the last

decade of the 20th century into the 21st century the internet has proved to be a high medium of communication for all humans. Thus the ICT along with the internet have proved to be sources of global advancement.

What constitute the ICT? According to a study by Emunemu, Isah and Isuku (2013), ICT comprises of those technologies that can be used in communications for examples; laptop or desktop computers, smart phones, printers, scanners, digital cameras, radios, Television sets, servers etc. In recent times, more can be added to the list as the social network media joins the foray and these include such software advancements in communication that involves the face-book, instagram, LinkedIn, email, twitter etc. With these additions, several or almost all activities have now gone on-line.

Ajadi (2012) and Isah (2012) did not fail to point out in their various studies that requirements to facilitate the generation, utilization and dissemination of information lies with technology and so conducted studies on higher education in Nigeria. In the first instance, Ajadi (2012) examined modern modes of studies that included the face to face mode where the teacher and students interact. It was found extremely expensive and not too applicable to the 21st century where educational provision has not only become complex but students are more complex. The studies also found that all over Africa, absence of policies on ICT made that adoption of ICT difficult (Lundu and Mbewe, 1993). It is gratifying that today, most African countries including Zambia and Nigeria not only have IT and ICT policies but have decided to introduce ICT at the grassroots by making it an examinable subject at the West African Senior School Certificate Examinations (WASSE) and the National Examinations Senior School Certificate Examinations (NECO).

The secondary level of education in Nigeria is quite important because it serves as the gateway to university education. The Federal Republic of Nigeria (FRN, 2004) policy on education spelt out the position and role of teachers in a nation. Again, it is observed that if the ICT section of Nigeria is not developed then Nigeria will not only lag behind in development but will queue behind other countries which are its contemporaries such as India, Indonesia, Korea, China and Taiwan in development. The arrival of the National policy on ICT is not only heart warming but encouraging as the process of ICT development and integration has commenced. The big question is how do we implement this policy? From the perspective of this study, teachers need to be adequately prepared and empowered for the ICT. Again, ICT equipment needs to be acquired and distributed to schools.

The effectiveness and benefits of ICT deployment and utilization in schools can be captured from the study of Rosen and Michelle (1995) who affirmed that technology deployment in education should cut across all facets of school activities including co-curricular and extra-curricular activities. According to the study it should be a cross curricular activity so that its acquisition should not only be limited to a particular subject but to all subjects

which in effect means that Rosen and Michelle (1995) is advocating for the complete reduction in the use of hard paper and pen. In Isah (2012), study on Nigerian Universities, it was found that ownership of ICT equipment for official work purpose by Nigerian University lecturers was insignificant less than 40% for first and second generation universities. On the student side, it was far less than 30%. The study observed that most University students in the first and second generation public universities in Nigeria then, depended on the use of Cyber café to do and submit assignments. Babalola (2010) had previously captured most of the challenges that faced the integration of ICT to public schools to include the absence of critical infrastructure as electricity, high cost of soft and hard ware materials in excess of what transpires in the west and absence of personnel to man these equipment.

Despite the emerging facts shown above, the question then arises, how do we integrate ICT effectively into the secondary school curriculum especially its teaching? From the point of view of this study, syllabus is a major part of a curriculum as it details out what ought to be taught and how it should be taught and examined (Isah, 2014). There is already a syllabus in place. A detailed description of who and what to teach is in place but a good question is what is the level of the teachers? Does it conform to laid down rules? Are there ICT teaching and training equipment in schools? What is the level of utilizations of available ICT equipment?

Studies of this nature are particularly useful to policy makers and government. Though the various ministries of Education have their own reporting mechanisms, such could be biased giving a false impression (Nigerian) factor of those things that are not there hence a neutral academic research of this nature stands to inform the government and the general public of our efforts and consequently expectations. Again, examination bodies such as WAEC and NECO are better informed about the true situations in schools to enable them prepare remedies through examinations.

To drive home the importance of this study and due to limitations of the research in terms of funds and time, the research will be limited to Oyo State, in Nigeria and precisely Ibadan metropolis.

Statement of the Problem

The importance of ICT to global development cannot be over emphasized as continuous research is encouraged and such any nation lagging behind in ICT is gradually being put on the precipice of development. Scholars have over the years advocated for policy and inclusion of ICT into national development. These needs have been met in Nigeria in the development of both a national ICT and IT policy as well as the inclusion of ICT as an examinable subject at the WASSCE and NECO examinations. Previous policies in Nigeria always met with challenges at the implementation level either due to ill preparation as was the 1981 National policy on the 6-3-3-4 system of education. To this regard, this paper intends to examine the effectiveness in integrating ICT into the Nigerian

secondary school system. The study will answer some questions as regards the preparation of teachers towards the new ICT policy, allocation and dissemination of equipment as well as the relationship that have either arisen or could arise from it. The study will propose some hypotheses as well as research questions.

Research Questions

The following research questions are hereby formulated to guide this study;

1. To what extent are basic ICT teaching resources (radio, laptop, cassette, desktop, facilities and projector) available in Oyo state secondary schools?
2. Does the method of teaching ICT in Oyo state secondary schools conform to secondary schools national ICT curriculum?
3. What is the attitude of teachers in Oyo state secondary schools to the inclusion of ICT into the curriculum of secondary schools?
4. To what extent have teachers in Oyo state secondary schools received refresher training courses on ICT applications for the Utilization of ICT equipment in Oyo State in the last 5 years?

Hypotheses

The following hypotheses guided the study

H₀₁: There is no significant relationship between availability of ICT teaching resources (radio, laptop, cassette, desktop, internet facilities and projector) and the quality of teaching-learning in Oyo state, Nigeria.

H₀₂: Teacher quality has no significant relationship with students learning outcomes in ICT in Oyo state secondary schools.

Methodology

The study adopted the survey research design of the correlational type. The total population of the study consisted of teachers and students in Oyo state secondary schools. To ensure a deep penetration of the study, Oyo state was divided into Urban and rural sections with Ibadan metropolis assuming the role of urban. The urban local governments consist of 5 Local Government Areas (LGA)s from which Ibadan North LGA being the biggest was sampled. Ibadan North LGA has 42 secondary schools with 1,471 teachers. It is specifically chosen because of its urban centrality and closeness to the seat of political power. From the 47 schools, 15 were randomly sampled while 172 teachers were also sampled. Instrument for the study consisted of a questionnaire titled 'ICT integration and teaching process Questionnaire' (ICTITQ) with a reliability coefficient of cronbach alpha '0.61' considered good enough for the study. ICTITQ was face and content validated by colleagues in the Faculty of Education of the University of Ibadan, Ibadan, Nigeria.

ICTIQ was structured into 3 sections A, B and C. Section A elicited responses on bio-data while section B elicited responses on availability of ICT equipment in Oyo State (Ibadan) secondary schools while section C is on the Teachers quality and attitude in towards ICT in Ibadan schools. The questionnaire consisted of 30 test items with 9 on respondents bio-data being open ended. The remaining 21

test items were designed and developed after the Likert scale of Strongly Agree (SA) = 4points, Agree (A) = 3points, Disagree (D) = 2points and Strongly Disagree (SD) =1 point. The research questions were analysed using descriptive statistics while the hypotheses were analysed using inferential statistics (Pearson Product Moment Correlation) at $p < 0.05$ level of significance.

Findings

The following findings were made;

Research Question 1

To what extent are the basic ICT teaching resources (radio, laptop, cassette, desktop, facilities and projector) available in Oyo state secondary schools?

Table 1: Availability of ICT Teaching Equipment in Oyo State Secondary Schools

ICT Teaching Resources	Available in High Quantity	Available in Low Quantity	Not Available at All	Status	Mean	Std. Dev.
Television	4 (2.5)%	25 (15.6)%	131 (81.9)%	Not Available	2.79	0.464
Radio Cassette	4 (2.5)%	25 (15.6)%	131 (81.9)%	Not Available	2.82	0.487
Computers (Desktop & Laptops)	23 (14.4)%	58 (11.3)%	138 (86.2)%	Not Available	2.33	0.742
Internet Facilities	7 (4.4)%	26 (16.3)%	127(79.4)%	Not Available	2.74	0.58
Projectors	8(5.0)%	23(14.4)%	129(80.6)%	Not Available	2.74	0.59

The result shows the levels of ICT facilities available in schools. Most of the facilities are not available is sampled schools.

Research Question 2

Does the method of teaching of ICT Oyo state secondary schools conform to secondary schools national ICT curriculum?

Table 2: Oyo state ICT Teaching and Conformity to National Curriculum

Test Items	SA	A	D	SD	Mean	Std. Dev.
ICT teaching resources as TV and Radio do not determine teachers performance in ICT teaching	26 (16.3)%	43 (26.9)%	48 (30)%	43 (26.9)%	2.32	1.1
A teacher from your opinion can perform effectively in teaching ICT without ICT resources	46 (28.8)%	68 (42.5)%	18 (11.3)%	28 (17.5)%	2.82	1.1
As an ICT teacher, you are well versed in the national ICT curriculum	54 (33.7)%	27 (16.9)5	33 (20.6)%	46 (28.8)%	2.53	1.23
You are an ICT graduate teacher (Specialist)	19 (11.9)%	9 (5.6)%	59 (36.9)%	73 (45.6)%	1.82	0.9
This school's approach to ICT teaching conforms with what obtains in the national ICT secondary school teaching curriculum	20 (12.5)%	7 (4.4)%	60 (37.5)%	73 (45.6)%	1.83	0.98

Research Question 3

What is the attitude of teachers in Oyo state secondary schools to the inclusion of ICT into the curriculum of secondary schools?

Table 3: Attitude of Oyo State Secondary School Teachers to ICT Teaching Process

Test Items	SA	A	D	SD	Mean	Std. Dev.
I feel intimidated as a teacher at the sight of ICT because I am not proficient in its utilization	17 (10.6)%	12 (7.5)%	66 (41.3)%	65 (40.6)%	1.9	0.95
learning to adapt to the utilization of ICT for teaching at this period in my career is unrealistic	13 (8)%	14 (8.8)%	61 (38.1)%	72 (50.0)%	1.79	0.9
Oyo State should make the acquisition of ICT skills compulsory to all its teachers	71 (44.4)%	76 (47.5)%	7 (4.4)%	6 (3.7)%	3.32	0.82

Research Question 4

To what extent have teachers in Oyo state secondary schools received refresher training courses on ICT applications for the Utilization of ICT equipment in Oyo State in the last 5 years?

Table 4: Level of ICT training received by Oyo State Teachers

Test Items	SA	A	D	SD	Mean	Std. Dev.
You have attended ICT workshops or seminars organized by the Oyo State government or any other agency of government in the last 5 years	40 (25.0) %	21 (13.1) %	37 (23.1) %	62 (38.7) %	2.24	1.22
As a PTA paid teacher, you are not entitled to any refresher course or programme	111 (69.4) %	43 (26.9) %	4 (2.5)%	2 (1.3)%	1.35	0.6
As a PTA teacher, you teach ICT in your school	2 (1.3)%	4 (2.5)%	43 (26.9) %	111 (69.4) %	1.4	0.55

Hypotheses 1

There is no significant relationship between availability of ICT teaching resources (radio, laptop, cassette, desktop, internet facilities and projector) and the quality of teaching-learning in Oyo state, Nigeria.

Table 5: Relationship between ICT Training resources and Teaching Quality in Oyo State

Variables	No	Mean	SD	r	Sig	P	Remark
Availability of ICT teaching resources	160	14.463	2.458	0.0118	0.139	0.05	Not significant
Quality of Teaching (teaching in the ICT teaching process)	160	15.150	2.93440				

$p < 0.05$

This result ($r=0.0118; p < 0.05$) indicate the rejection of the Null hypothesis indicating that a significant relationship exist between availability of ICT teaching resources and the quality of ICT teaching in the teaching process among secondary school teachers in Oyo state, Nigeria.

Hypotheses 2

Teacher quality has no significant relationship with students learning out comes in ICT in Oyo state secondary schools.

Table 6: Relationship between Teacher Quality and Students ICT Learning Outcome in ICT Teaching Process

Variables	No	Mean	SD	r	sig	P	Remark
Teacher Quality	160	15.0750	2.93440	0.089	0.000	0.05	Significant
Students Learning outcome in ICT teaching process	160	7.9313	2.89246				

$P < 0.05$

The result $r=0.089; p<0.05$ indicates an acceptance of the Null hypothesis and a rejection of the alternate hypothesis. It means that the quality of the teacher as far as this study is concerned does not determine the learning outcomes of students in ICT. This is not so in other subjects.

Discussion of Findings

The foregoing results will be discussed under the headings ICT availability, Teacher Quality and Students Learning outcomes in Oyo State Secondary Schools in Nigeria.

ICT Availability and ICT Teaching in Oyo State Secondary Schools

The availability of ICT equipment in schools is an issue of importance as most times, attainment of proficiency in the use of ICT equipment lies in the ability to get access to them and practice. Practical sessions on ICT are inevitable in the acquisition of ICT skills (Isah, 2012). Most schools especially private schools have access to ICT equipment but not public schools. As already stated earlier, Babalola (2010) had earlier mentioned the challenges to ICT equipment acquisition and utilization in Africa. From the study, Table 1 shows the commonest types of ICT equipment that could be found anywhere but their availability is quite low. The finding of this study only indicates that the problem of ICT availability in Oyo state is still as potent as it was in 2010 when scholars started investigating the ICT challenge. If the problem be so adverse with availability being as low as 18.1% in Ibadan metropolis, what will it be in rural schools all over Oyo state? It is clear that urgent administrative steps need to be put in place to acquire state of the art ICT equipment for secondary schools. However, expectations in external examinations from public schools will not be too high.

ICT Teacher Quality and Students Learning Outcomes

Teacher quality did not differ from what has been in the past. Qualified ICT teachers in sampled schools only came 17.5% but 91.9% of sampled teachers as shown in Tables 2 and 3 agreed that ICT skills acquisition be made compulsory for all students and teachers. It cannot be over emphasized that the government has been paying lip service to the issue of ICT skills acquisition. The foregoing conforms to Rosen and Michelle (1995) study that affirmed that technology deployment in education should cut across all facets of school activities. The introduction of ICT into secondary school curriculum is in line with the earlier recommendations of Lundu and Mbewe (2003) among other. This study found in Table 6 that no significant relationship existed between the quality of teachers and the learning out comes of students with $r=0.089; p<0.05$ which is at variance with the postulation of FRN (2004) that explains that no nation cannot grow beyond the level of its teachers. How come that in this case, ICT, students will not need teachers. It might not be unconnected with the assumption that some of these students already have access to some of these facilities before coming to school.

From the finding of this paper, ICT is both theory and practical as Table 3 showed the quality and some attitude of Oyo state teachers towards ICT. It is not

unlikely that many of them are not properly trained and some obtains in other parts of the country. The simple indication is that as inquisitive minds, students may be able to meet practical requirement on self-study but the same cannot be for theoretical study. If Nigerian secondary schools students are going to make an impact in relation with the goals of the national ICT policy and reasons for including ICT in the school curriculum, Teacher training in ICT is quite necessary and important

Teacher Attitude and ICT Proficiency

It is argued that the attitude of teachers could be responsible for their inability to acquire requisite skills and also transfer these skills but the study proved such skepticism wrong as Tables 2 and 4. In the last 5 years, 38.1% of urban teachers have received proficiency training in ICT but how effective this training is cannot be determined here. Among teachers, about 80% received no training as they are adhoc teachers employed by the Parent-Teachers Association (PTA) to augment that provided by the state government. The teachers have a positive disposition towards the adoption of ICT in teaching as 91.9% in Table 3 agree that Oyo state government should make ICT skill acquisition for teacher a must hence they may not be averse to the adoption of ICT. This is in line with Babalola (2010) and Hagittai (2006).

Summary and Conclusion

This study investigated integrating ICT into Oyo state secondary schools looking at the facilities already available in Oyo state schools with emphasis on Ibadan urban (Ibadan North) Local Government Area. The study also looked at the teaching learning process as well as prospects of ICT in secondary school teaching, quality of teachers and students learning outcomes in schools. The study was able to find out that a positive relationship existed between ICT availability and ICT teaching which is in line with extant literature on ICT but found that an insignificant relationship existed between ICT and learner outcomes which did not agree with literature. The study gave reasons why the result could be that.

Recommendations

In the light of the findings of this study, the following recommendations are herewith proffered;

- 1) There should be provision of ICT equipment in Oyo state secondary schools. ICT is such that require high expenditure to make it practical oriented and improve of expected learner outcomes.
- 2) The study indicated that teachers are poorly trained. It is also painful to find that some of the teachers of ICT in urban schools are PTA teachers whose pay is nothing to write home about. With the goals of ICT so high with the Federal Government of Nigeria (FGN) ICT policy, it is expected that more ICT teachers be employed. Apart from employing more ICT teachers, those already there who have not been trained should be trained.
- 3) There should be boosting of teacher morale by providing ICT equipment that are mobile to teachers. Some states in Nigeria are already doing that. Since

the study showed that attitudes of teachers to the adoption of ICT is high, government, policy makers and school authorities should provide equipment and make them teacher friendly.

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