INTEGRATING ICT IN THE TEACHING AND LEARNING PROCESS: TEACHERS' EXPERIENCE AT SECONDARY SCHOOL LEVEL

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Abstract

This study was prompted by the technological advancements and the demands for ICTs by both students and teachers to face the challenges of the 21st century. Two hundred teachers were sampled from the Owerri Educational Zone in Imo State through stratified random sampling technique. Questionnaire titled secondary school teachers' information and communication technology competency test (SSTICTCI) was used to collect data. Mean served as the statistical tool for data analysis for research questions 2, 3and 4, while question 1 and 5were analyzed with percentages. Findings show that teachers were aware of ICT resources but do not utilize them while teaching. Many constraints were identified including lack of computer literacy on the part of some teachers, lack of ICT facilities, lack of fund, erratic power supply, no adequate knowledge of the use of internet among others. It was recommended that for quality assurance and for effective ICT integration in curriculum, teachers should be encouraged through workshops, seminars and conferences to be ICT literate; stake holders in education should join hands together in making ICT pedagogical an methodological issues fully integrated in the teaching and learning process in secondary education for quality assurance.

Introduction

Most of the developed countries have exploited the potentials of ICT to transform their educational landscape at the tertiary, secondary and even primary levels particularly through the instructional process (Kosakowski, 1998). Generally ICT holds out the opportunity to revolutionize pedagogical methods, expand access to quality education improve the management of education systems (World Bank, 2002). Hence curriculum in the 21st century Nigeria urgently demand for teachers capable of effectively handling ICT resources for the purpose of helping students to radically obtain and manipulate information for their educational resource development.

ICT potentials are capable of transforming the nature of education – where and how learning takes place and the role of the students and the teachers in the learning process provides no debate. Ultimately the power of ICT will be determined by the ability of the teachers to use the new tools for learning to create rich, new and engaging learning environments for their students. The UNESCO world education report (1998) supporting the above noted that:

> *There are indications that the new technology could have radical implication for conventional teaching and learning process. It notes that in reconfiguring how teachers and learners gain access to knowledge and information the new technologies challenge conventional conception of both teaching and learning materials and teaching and learning methods and approaches* (p.13).

The challenge for ICT integration in the teaching and learning process is to ensure that the new generation of teachers and practicing teachers are well prepared to use new learning methods, processes and materials with the new ICT tools for learning.

Concept of ICT

ICT is an interdisciplinary science primarily concerned with the collection, classification, manipulation storage retrieval and dissemination of information (Wikipedia, 2008). Abimbade (1996) saw ICT as a concept, method, function, process or system of collecting, analyzing, processing and sharing of information using electronic equipment. According to Ezekoka (2007), it is a means of accessing or receiving, storing, transforming, processing and sending ideas, perception or information through computer and their telecommunication facilities. ICT encompasses all that is involved in modern communication satellites, radio, television, video, tape recorders, compact discs, floppy diskettes and personal computers and other related equipment so that the output generated can reach the user at reasonable cost and in good time to the overall benefit of mankind

To prepare the students for the challenges of the 21st century workplace and community leadership, the integration of information technology into teaching and learning process becomes in evitable. Also in preparing these students, classroom use of technological tools and applications must be supported so that teachers can create learning environments that enable students to become responsible for their own learning, focus on process and outcomes specific for their individual learning states and needs. Adekunle (1997) stated that students' ability to write, speak and analyze information can be improved on as part of their individual and personal growth through information technology. Furthermore, Adekunle posits that teachers report many benefits from the use of information technology as productive tool in developing their own instructional materials and managing classroom and student information.

Consequently, the application of ICT makes learning more efficient and productive facilitate teacher's pedagogical activities and students' academic performance. For instance e-learning is becoming one of the most common means of using ICT to provide learning to students both on and off campus by means of online teaching offered via web-based system (Yusufu, 2005; Mutula, 2003). Furthermore, ICT allows students and teachers to control, manipulate, and contribute information to learning and teaching environments as interactive books, journals and the like are usually made available via Internet (Oxfarm Educational Report, 2002).

Integrating ICT in Teaching and Learning at Secondary School Level

Integrating ICT into teaching and learning refers to the process of determining which products and processes of ICT should be appropriate for give classroom situation and problems (Ifegbo, 2005). Referring to the instructional uses of ICT, the teacher is expected to acquire competencies and expertise in the utilization of ICT so as to be able to use it properly for lesson delivery. In the teaching and learning process the learner the curricular contents, the specified objectives, the materials/methods and the teacher interact in the instructional system to achieve the expected result.

According to Ukwungwu (2004), the interaction of ICT into the curriculum demands the availability of ICT friendly teachers and these ICT friendly teachers are trained teachers with proficiency in computer operation, programmed production and developing suitable software. Ukwunga further stressed that most developing countries of the world including Nigeria have fallen behind in science education delivery due to their inability to utilize ICT resource. The conventional and traditional teaching approach still takes the lead in our secondary schools.

Liverpool (2002:163) identifies the uses of ICT in education to include ICT as objects; as an assisting tool, as a medium of teaching and learning, as a tool for organization and management in schools. In the instructional uses of computer, some classified computer as a teacher and as a tool, appropriately computer in instructional delivery should be classified as a teaching device because computer cannot substitute a

teacher rather it can serve as a device through which the teacher prepared lessons are delivered. Also it should not be seen as a tool for learning rather it can be better classified as a learning machine (Ifegbo, 2005). Computer as a teaching device is used to assist instruction in the form of drills and practice, tutorials and dialogue, simulation and games and as subject of instruction while as a learning resource, it could be used in information processing, data collection and analysis, data retrieval resources and computer mediated communication.

Statement of the Problem
ICT should be fully integrated in the secondary schools across the nation for the challenges of the 21st century education to be met. Yusufu (2005) opines that most teachers in the federal government colleges in Nigeria do not have the needed experience and competence in the use of computer for educational and industrial purpose while Afolabi, Adedapo and Adeyanju (2005) posit that ICT facilities are not utilized in teaching and learning in Oyo State college of education. Ekukinam (2002) posit that the teachers are not extrinsically motivated to utilize ICT resources due to non-availability of ICT materials in our educational institutions. Further to that, Elkim (1985) earlier noted that the ultimate decision to use or not to use the ICT resources in the classroom lies with the teachers' knowledge of ICT and their attitudes. Whereby teacher training institutions have not embraced the use of ICT, there should be a problem.

This paper therefore tries to find out the available ICT resources in the secondary schools in Owerri educational zone in Imo State, the extent teachers utilize these resources, the challenges they face for proper integration and the alternative to the use of ICT.

Research Questions
The study was guided by the following research questions.
1. What are the available ICT resources used in teaching and learning in secondary schools in Imo State?
2. To what extent do teachers use ICT resources in the teaching and learning process?
3. To what extent do teachers involve students in the use of ICT resources in the teaching and learning process?
4. What are the challenges encountered by teachers in secondary schools in the integration of ICT in the teaching and learning process?
5. What alternative resources do teachers use in the absence of required ICT resources?

Methodology
Descriptive research design was adopted in this study to ascertain the actual utilization of ICT resources in the teaching and learning process by the secondary school teachers. The sample population was two hundred teachers sampled from secondary school teachers in Owerri educational zone through stratified random sampling technique. A set of questionnaire titled "Secondary school teacher's information and communication technology competence test" (SSTICTCT) was used as the instrument to collect data. 180 respondents out of the 200 returned their questionnaire appropriately completed. Mean served as the statistical tool for data analysis for research questions 2-4 while research questions 1and 5 were analysed using simple percentage. A mean rating of 2.5 and above was considered as positive response while a rating below 2.5 was considered as negative. A four point modified Likert scale of Great extent, Moderate extent, Little extent, and No extent was used to calculate the mean for table 2-4 while Available, Not available, Used and Not used for research questions 3 and 5 respectively. Also responses from 50% and above was positive while below 50% was negative.

Findings
Research Question 1: what are the available ICT resources for use in the secondary school?

Table 1.1 Response of teachers indicating the available ICT resources for use in secondary schools

S/N	Item	Av.	%	Not Av.	%
1	Interactive white board (Smart board)	-	-	180	100
2	Computer/CD Roms	120	66.6	60	34.4
3	Video discs	20	25	160	75
4	Multimedia projectors	89	49.4	99	51.6
5	Slide projectors	67	37.2	113	67.8
6	Televisions Video tapes	37	20.5	143	79.5
7	Radio /audio	55	30.5	125	69.5

From the table 1.1 above, computers/CD-Roms has 66.6% and so is considered available while the other six (6) listed ICT resources are below 50% and therefore not available.

Research Question 2: To what extent do teachers use ICT resources in teaching and learning?

Table 2.1 Mean response of teachers' use of ICT resources in teaching and learning

S/N	Item	Mean
1	Interactive white board (Smart board)	0.8
2	Computer/CD Roms	2.0
3	Video discs	1.3
4	Multimedia projectors	1.1
5	Slide projectors	1.0
6	Televisions Video tapes	1.2
7	Radio /audio	1.3

From table 2-1 the mean of all the listed ICT resources were less than 2.5 showing that none of the ICT resources were used by the teachers in secondary schools in Owerri educational zone. Not even the computer considered available.

Research Question 3: To what extent do teachers involve students in the use of ICT resources?

Table 3.1 Mean response of teachers' involvement of students in the use of ICT resources in teaching and learning

S/N	Item	Mean
1	Giving assignments to be done using the Internet	2.0
2	Directing them to use Virtual Library	1.4
3	Use of instructional television/videotaped lessons	1.1
4	Instructional radio/audio taped lessons	1.2

The mean score of all the listed items in table 3.1 were below 2.5 showing that the teachers' involvement of the students in the use of ICT resources is very low.

Research Question 4: what are the challenges encountered by the secondary school teachers in the effective integration of ICT in teaching and learning?

Table 4.1 Mean response of constraints to effective integrative use of ICT resources in teaching and learning process

S/N	Item	Mean
1	Lack of Internet services	3.5
2	Inadequate knowledge of the internet by teachers and the students	2.9
3	Lack of funds	3.7
4	Erratic power supply	2.6
5	Lack of qualified technical personnel	3.7
6	Inability to identify the required resources	1.7
7	Lack of time	1.9
8	Non-availability of ICT facilities in schools	3.7
9	Lack of computer literacy on the part of some teachers	3.8

Data presented in table 4.1 shows that the most inhibiting factor to the integrative use of ICT resources was lack of computer literacy on the part of some teachers (mean =3.8) followed by non-availability of ICT facilities in schools (mean=3.7). Lack of funds (Mean= 3.7) and lack of qualified technical personnel among others were indicated as being very problematic.

Research Question 5: What alternative resources do teachers use in the absence of the required ICT resources?

Table 5.1 Response of teachers indicating alternative resources used in absence of the required ICT resources

S/N	Items	Frequency Used	%	Frequency Not Used	%
1	Posters	100	61.1	70	38.9
2	Textbooks	180	100	-	-
3	Charts	148	82.2	32	17.8
4	Maps	137	76.1	43	23.9
5	Newspaper cuttings	120	66.6	60	33.4
6	Slides/slide projectors	119	66.1	61	33.9
7	Opaque projectors	103	57.2	77	42.8
8	Realia	163	90.5	17	9.5
9	Models	121	67.2	59	32.8
10	Flannel Boards	100	55.6	80	44.4
11	Bulletin Boards	156	86.6	24	13.3

From the displayed in table 5.1, all the listed items (instructional media) recorded percentages above 50% indicating that they are used.

Discussion of Findings

The purpose of this study was to determine the extent teachers utilize ICT resources in teaching and learning in secondary schools in Owerri educational zone. The study revealed that out of seven (7) listed ICT resources, only one item – computer/CD-Roms was available. The availability of computers in school system could be attributed to the recent introduction of computer studies in the school system through the National Educational Research Development Council (NERDC, 2007) and the subsequent supply of computers to some public schools by the Universal Basic Education Commission. Others like interactive whiteboards, video discs, multimedia projectors etc. were not available as they were below 50%. This finding confirms the recommendation of Anekwe (2006) that adequate learning environment in form of infrastructural facilities and technological equipment with internet connectivity should be provided for successful implementation of ICT in the classroom.

The result also showed that teachers in secondary schools in Owerri were not utilizing ICT resources in teaching and learning. This implies that they are yet to embrace ICT resources in an ICT era or ICT world base. The non-utilization of ICT resources may not be unconnected with the non-inclusion of ICT in teacher education curriculum where these teachers were trained. This finding lays credence to the findings of Babalola, Ibitoye and Efunbayo (2002) that a growing number of teachers in most schools lack the required knowledge, technique and professional capabilities to harness computer technologies into teaching and learning. This finding negates the findings of Yusufu (2005) that teachers exhibit great enthusiasm and positive attitude towards the use of ICT.

The study further revealed that teachers' involvement of students in the use of ICT resources is very low. This finding confirms the teacher's low level perception and low ICT literacy level which has been identified as a common problem which needs to be addressed adequately and urgently too. According to Koohang (1987) successful use of ICT is dependent on learners' acceptance which has been found to be affected largely by teachers' literacy level and attitude. Supporting this view, Yusufu (2005) and Anao (2003) posit that most school teachers lack the skill and literacy to fully utilize the ICT and other common software.

Some constraints and challenges to effective integration of ICT resources into teaching and learning were also highlighted. They include the following: lack of computer literacy on the part of some teachers, non-availability of ICT facilities, lack of fund, lack of qualified technical personnel, erratic power supply, lack of Internet services and others. This finding is in consonance with the findings of Yoloye and Adekawanishe (2005) that there is poor telecommunication infrastructure in Nigerian institutions of learning and this constitutes a barrier to ICT integration in Nigeria. This implies that for effective integrative use of ICT resources in the teaching and learning process, these aforementioned constraints must be given urgent attention by the appropriate authorities.

The outcome of the study on the alternative resources used by teachers in the absence of the required ICT resources confirms the findings of Anao (2003) that the computer and the Internet are not yet part of classroom technology in 90% of public schools in Nigeria. This implies that the older technologies are still very much in use in the instructional processes in secondary schools.

Conclusion
This study has revealed that secondary school teachers in Owerri educational zone are aware of ICT facilities but are not yet utilizing them in teaching and learning process. The involvement of students in the use of ICT resources is very low because of their low literacy level and poor attitude towards the use of ICT resources in instructional process. The older technologies are very much in use in the secondary schools and this is a pointer to the fact that teachers in Owerri are yet to embrace ICT resources in teaching and learning process.

Recommendations
In view of what the paper discussed and the situation of ICT resources and its application in teaching and learning in secondary schools, the following recommendations were made.
(1) The government through the State Universal Basic Education Board should organize continuous and periodic training and retraining of teachers through capacity building workshops, seminars and conferences to boost their ICT literacy level to enable them utilize ICT resources while teaching their students
(2) There is an urgent need for government to provide ICT facilities at all levels of education
(3) There should be training of ICT experts specifically for instructional design who will work with the teachers and the students in the schools.
(4) The problem of erratic power supply should be addressed while schools should on their own procure stand-by generators that can supplement the Power Holding Company of Nigeria (PHCN) for supply of electricity.

(5) Every professional teacher should be computer literate and should not shy away from their teaching responsibility by dogging the use of ICT resources.

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