INTEGRATING INFORMATION AND COMMUNICATION TECHNOLOGY IN CLASSROOM LEARNING IN PRIMARY SCHOOLS

CHINYERE NWOKE
Department of Educational Psychology and Primary Education,
Abia State College of Education (Tech),
Arochukwu.

And

DR. H. N. UKPABI
Department of Educational Psychology and Primary Education,
Abia State College of Education (Tech),
Arochukwu.

Abstract

The world having become a global village has made accessible information almost overwhelming and therefore, making it imperative for a very fast and reliable method of communicating them to the young ones to be designed. It is in this regard that the use of ICT has been identified. This paper has therefore listed the varieties of equipments and infrastructure constituting ICT, the advantages of their use to create a rich and engaging learning environment as well as the major concerns of integrating ICT in the classroom activities of primary schools in Nigeria. Solutions to some of the problems of ICT use such as enabling policies and strategies, maintenance, cost of purchase, training and retraining of teachers and support staff were proffered.

With the world becoming a global village, the amount of information available in the world to be accessed is overwhelming and therefore, requires a very fast and reliable method of communicating them. Literature search has shown that there has been quite some increase in the development of new Information and Communication Technology (ICT) equipments, materials and facilities as well as its utilization to improve teaching and learning in schools in many countries of the world. Undoubtedly, the computer has become an innovation of a major magnitude (Simon, 1983). Alongside, the internet has provided an operating system, software and networks for reducing cost of communication and for operating specific tasks. (Olele, 2006; Jones and George, 2003) and also has revolutionized learning (Rosenberg, 2001).

The innovation has greatly influenced all aspects of human endeavours such as education, banking, business, politics, religion, communication and so on. Consequently, it is now common place to embrace new terminologies like e-learning, e-payment, e-banking, e-preaching, e-governance, chatting, pinging etc.

Despite the novelty of this innovation, there seem not to be any significant use of ICT or change in the traditional "chalk and talk" mundane method of teaching and learning in the Nigerian school system as can be observed during teaching practice supervision of student teachers in both primary and secondary levels.

A study by Olele (2006) on the awareness profile of primary school teachers in Rivers State of Nigeria regarding information technology shows that they were only marginally aware of the use of ICT in classroom teaching.
The lack of awareness and enthusiasm to use ICT in classroom seem to stem from:

a. having not received adequate training in
i. understanding and applicability of ICT in school activities.
ii. the use of computer and its relevance as a veritable tool in enhancing teaching and learning.
b. computers not being available in the public school system and,
c. having no practical on-the-job experience of the use of ICT as a tool in teaching and learning (Akudalu and Anekwe, 2004; Lockhead and Verspoor, 1991; Ibitanyo, 2003).

Since the modern Nigerian child is living in this computer / internet era, he should be exposed in his daily life to the gains of the multimedia information technology through the activities of teaching and learning in the schools especially at the primary level which is the key to the success or failure of the whole education system (FRN, 2004).

Developed countries of the world such as Britain, Japan, USA are taking steps to ensure more progress in the integration of ICT in their schools through evaluating the impact of their national ICT policies on teaching and learning as to meet the needs of individual learners. (Bodys, 2005) Studies by Olele (2006) and Chinwe (2007) among others show that teachers and pupils are fairly aware that computers could be used in the classroom for learning but most of the teachers are not computer- literate and computer laboratories are not available but some children go to the internet on their own perhaps, with their seniors to obtain information and sometimes, they are exposed to materials not appropriate for their consumption. This shows that there is a lot of problem and the school system is still lagging behind in this ICT age especially at the primary school level.

There is no doubt that the progress and advancement of any society have always been knowledge-based and to link with this knowledge that has exploded exponentially, means that nations must design policies and practices that use ICT to enhance the status of its education survival and basic well-being. In this regard, UNESCO (1998) has advised that a synergic effect occurs when important information is coupled with capacity to communicate it thus, producing a force that should be positively and consciously designed for the attainment of defined learning needs.

In the consideration of the above scenario, Nkemakolam and Iheonuekwu (2006) came to the conclusion that teacher education institutions are faced with challenge of preparing a new generation of teachers to effectively use the new learning ICT tools in the classroom to create a rich and engaging learning environment.

The challenge of this paper is to consider the various issues of this daunting task and proffer solutions. The paper therefore discussed what constitutes the major learning tools and infrastructure of ICT employed in teaching and learning in primary schools, the advantages of their use in classroom learning activities and finally, the major challenges of integrating ICTs in Nigerian Primary Schools.

ICT Learning Tools and Infrastructure

A survey of literature in this area, (Ugwuaja, 2007, Udoukpona, Emah and Okon, 2007; Mckenna and Mckenna, 200; Selinger, 1999 and Akinson 1997) revealed that the major components and infrastructure constituting information and communication technologies include the following: computers, data projectors, digital cameras and facilities for digital video editing, computer-connected microscopes and internet facilities. The internet services allow for e-learning, electronic communication, electronic mail, World Wide Web (WWW) and video conferencing. Other components include colour television, electronic white board, computer –TV interface, multimedia audio-visual aids.

The information available to the school system has increased exponentially such that it requires special methods and facilities for its conveyance quickly and effectively. Integrating ICT in the classroom involves the use of ICT by teachers to develop, present and describe materials in their subject areas; enhance knowledge transfer process especially through animations and simulations, enrich and deepen skills that help learners relate classroom experiences to life practices as well as provide real opportunities for individualized instruction to mention a few. Effective use of technology supports instruction in languages, arts, social sciences, mathematics, sciences and other subject areas.

When teachers include ITC into their classroom practices, learners are gingered to actively participate in learning, especially when used alongside other conventional methods and tools. ICT will be more effective in teaching and learning in primary schools as children at this level are likely to still be operating at the concrete-operational level according to Piaget.

Benefits of Integrating ICT into Classroom Activities

As mentioned earlier, one of the tasks of this paper is to show that ICT could be used to create a rich and engaging environment. Children learn ICT provides them the opportunity to be occupied in class activities. This enables them to achieve some independence and autonomy as they could be required to design something or engage in exchange of ideas and hence, begin to develop communicative skills or potentials. At this level, the teacher acts as a facilitator and motivator by arranging the various ICT components and facilities and possibly, presenting a science or mathematics concert visually through the use of a three dimensional diagram or by animation.

One of the most important benefits of integrating ICT in the classroom learning process is its potential to motivate young people and at the long run improve their school achievement. Since these tools usually involve a hands-on experience making them active, they get interested as they immediately make things happen and thus become usefully engaged in the learning activities. In the same manner, children have very unique opportunities to learn in a larger variety of ways that are better suited to different learning styles and they are guided to what behavior is expected of them at any given point in time.

The internet with its World Wide Web (WWW) as the largest and most easily accessible authentic collection of resource materials available to both teachers and students including most recent additions and updates constitute a unique motivator for engaging learners (Akinson 1997 and Mckenna and Mckenna 2000). It enhances performance of teachers in terms of enriching content material delivery as it facilitate interaction and collaboration among teachers at both local and global levels. Moreover, ICT make classroom controlling more effortless as it provides programmes and activities that meaningfully engage learners' faculties, proffering suggestions on what learning experience to practice at any given point in time.

The study by Bodys (2005) observed that many pupils enriched their learning experience by using ICT in a range of ways across their learning and across the curriculum. In both primary and secondary schools, where the use of ICT were best practiced, it allows learners to

i. be more individually and actively involved in the learning process

ii. be more independent in their learning and make more choices about how and what they learn.
iii. be able to interact with their learning resources.
iv. move at an appropriate pace in their learning
v. be challenged in their learning activities.
vi. be more creative in the way they respond to the learning process
vii. consolidate their learning on an individual basis
viii. access global information that equips them to proffer potent and innovative solutions to social challenges.

Changes in Pedagogy Arising from Use of ICT in Classroom Activities

Report from the use of ICT involving computers with their various attachment and software programme, video technology, CD-Roms and internet applications have led to many changes in the society both technical and structural in nature. As teachers are beginning to integrate ICT in their classroom activities, its impact in school-related programmes and activities can never be over-emphasized especially from countries and schools in the fore-front of its implementation. This section considers some of the ways in which the use of ICT changes the work of teachers.

Ely (2002) Santrock (2008), and White and Hubbard (1998) observed that education in the ICT age has expanded to include the diversification of the teaching profession and redefinition of basic literacy skills. Pre-service and in-service teachers are expected to be computer literate especially in the area of its practical application in education. Such knowledge avails them the competence to use data projector and power-point packages to enhance their presentation of new lesson. The presentations are usually made to be visually attractive and in a flexible way in order to make further development and revision of material easy. With such packages, teachers are in good position to give a more consistent and valid delivery from staff to staff and to different groups of pupils.

It also enhances better interaction especially with regards to better quality questioning and answer between teacher and learner which encourage pupils to be more proactive in their responses. More so, packages such as computer Assisted instruction (CAI) makes teachers observers, users and possibly, writers of instructional programmes availing them the opportunity of putting their initiatives to problem solving in the classroom as well as building their own competencies and abilities.

Teachers are expected to adopt different pedagogical styles, different types of classrooms, equipments, different types of group of pupils, different types of activities etc in the discharge of their duties. This is especially so because pupils are more and more diverse and teachers have to intervene in many different ways to suit their needs.

Thus, the teacher workload has now been upgraded to that of a facilitator, adviser, counselor, organizer, guardian, master and manager of information, communication and technology thereby increasing the responsibilities in both the office and laboratories.

The use of interactive whiteboard software provides the teacher with a wide range of flexibility in the use of resources. He is able to record instruction and send the materials to students for use and reuse at a later date. This technology is very effective for pupils who require repetition, those "struggling " to learn and those absent from school for whatever reason when the lesson was first presented. This is because seeing the exact structured presentation of lesson that had occurred in the classroom with the teacher's audio input can be of immense benefit in transforming learning and instruction in the classroom especially in improving pupils' numeracy and skills.

Technology integration, as can be seen, is much more than putting computers and their derivatives in the classroom and it does not happen in a vacuum. There are a number of pedagogic concepts that power ICT integration in the classroom. These include:

1. Collaboration - that is, learning as a team and how to work in partnership both for the teacher and the pupils despite the fact that ICT offers opportunity to individual learner for independent work and at each person's pace. It is the job of the teacher to schedule and ensure that multimedia course wares such as video-conferencing and teleconferencing among other concepts relevant to teaching and learning do not bewilder the pupils
2. Information literacy – that is, the teacher being a facilitator, motivator, mentor and co-learner, guides learners to locate, manipulate, manage, evaluate and communicate information from various sources. By so doing, they develop skills in discrimination, interpretation and critical analysis.
3. Classroom organization – effective integration of ICT would involve the careful arrangement of various learning centers within the classroom. It also leads to teachers being eclectic in their use depending on variables like state or status of learners, content, experience and environment.
4. ICT integration in classroom now enable teachers to organize virtual field trips by using internet websites and so, learners are opportuned to have experiences of places, ideas, objects, persons and phenomena beyond the constraints of the classroom and immediate vicinity. Such internet field trips contrast on the advantage over traditional field trips as there are no limitations on destinations to be traversed and no restrictions on time and travelling costs including hazards, wear and tear of the body.
5. ICT use lead teachers to change in terms of learning how to arrange information to motivate pupils especially, visual literacy on how to use colour, object, size, and shape to create, organize and display materials

6. It is also important to draw the attention of teachers and pupils regarding ethical issues that must be paramount in the minds of ICT users especially in issues of plagiarism, slander, pornography, unlawful entry, unlicensed copying of hardware and creating viruses.

Problems Associated with the Use of ICT in the Classroom: Proffered Solutions

A number of glaring problems that militate against the take-off and smooth integration of ICT in primary school classroom include the following:

i. Enabling policy issues and strategies
ii. Teacher factors
iii. Poor infrastructure
iv. Cost of equipment
v. Irregular power supply
vi. Inconsistent network
vii. Dearth of appropriate technical support staff
viii. Poor scheduling and monitoring of pupils access to ICT
ix. Management's attitudes
x. Poor maintenance culture

Attempt to effectively integrate ICT at the primary school level would first of all, involve a careful and deliberate restructuring, redevelopment and strict enforcement of the National Policy for information technology especially at the basic level of the Nigerian educational system. This is because its potentials as a tool for addressing challenges in teaching and learning and as a change agent seem to be neglected" (Yusuf, 2005: 319).

Secondly, government should as a matter of priority, partner with UNICEF and other international Information Technology agencies to fund, procure and install ICT laboratories with full internet options, restructure school environment to be ICT compliant, deploy requisite technical resource experts as well as provide other necessary infrastructure especially power supply, for the successful integration of ICT in Nigerian primary schools.

Thirdly, the inevitable role of teachers in the implementation of novel innovations cannot be over - emphasized. Therefore, primary school teachers should be encouraged with adequate incentives, to undergo continuous and periodic training and seminars/workshops to properly equip them on the new pedagogical methods, indigenous software development, access to remote resources, collaboration among pupils, colleagues and mentors, virtual learning etc. to boost their interest, skills, competence and self esteem.

Fourthly, government in conjunction with UBEC, should constantly organize awareness campaign in all public primary schools to encourage both teachers and pupils on the use of ICT best practices as well as address any negative perception of parents towards their children's access to ICT facilities.

Fifthly, education authorities, through their appropriate agencies, should adhere religiously to systematic monitoring, inspection and evaluation of ICT facilities, processes and programmes and also, facilitate institutions compliance towards resource procurement, utilization and maintenance culture. School boards can promote best practices through organizing inter-school ICT based competitions.

Lastly, government can encourage effective and efficient ICT integration at the primary level of education by tasking network providers to improve on their service delivery and also partnering with relevant agencies to subsidize cost of computers and its accessories to make them affordable to both teachers and pupils.

Conclusions

It is quite obvious that ICT provides great potentials and opportunities that can bring about improvement in teaching and learning at the primary school level. Its successful and effective integration in the classroom requires effecting deliberate changes in school organization and pedagogy as well as provision of fully equipped ICT facilities, institutional readiness, teacher competencies, adequate financing and religious monitoring and evaluation of policies and programmes.

Exposing the Nigeria pupils early enough to ICT-propelled education have the multiplier effect of improving their academic performance including according them their pride to place in the fast global economic order as they will be empowered to access information for their lifelong general advancement.

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