PERSPECTIVES ON THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE NIGERIAN SCHOOL SYSTEM

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Abstract

Policy initiatives since 1988 have been targeted at ensuring the integration of information and communication technology (ICT) in the Nigerian school system. However, two scores since then, little impact of ICT has been felt in the Nigerian school system. This paper examines the relevance of ICT in education, the trends in policy initiatives in the integration of ICT in the Nigerian schools, empirical evidences on the integration of ICT in the Nigerian schools, and the barriers to ICT integration. The paper concludes with suggestions on ways of ensuring effective integration of ICT within the Nigerian schools system.

Introduction

Information and Communication Technologies (ICTs) have impacted greatly on teaching, learning, research, and school management in a number of ways. They are electronic technologies used for accessing, processing, gathering, manipulating and presenting or communicating information. It encompasses software, hardware, and even the connectivity (Anderson & Baskin, 2002). When ICTs are employed in education given the right condition, they can accelerate, enrich, and deepen basic skills in reading, writing, mathematics and the sciences. Also, they can motivate and engage students to learn as they become more independent and responsible for their learning. Furthermore, ICTs help to relate academics to the practices of today's work. Information and communication technologies, especially network technologies have been found to encourage active learning, support innovative teaching, reduce the isolation of teachers, and encourage teachers and students to become active researchers and learners. They can also strengthen teaching through the provision of powerful tools to teachers (Cradler & Bridgforth, n.d.).

Other derivable benefits of ICT integration in education include the following. Information and communication technologies can assist in reducing teachers' workloads through its use for lesson preparation and worksheet, writing students' report and individual education plan, and for collating and analysing students' attainment information for target setting. It is useful for recording and analysing attendance and disciplinary information, and maintaining link between the school and parent to ensure parental involvement in school activities (British Educational Communications and Technology Agency, BECTA, 2004). It can be used in getting necessary instructional contents, and collaboration can be ensured with teachers globally. In addition, teachers can also have up to date knowledge of a subject area.

Information and communication technologies can assist in teachers' development, for instance, the Internet. In the context of teachers' development, e-learning can be used for both initial and continuing development through courses, workshops, and other activities, formal or informal, where students and practicing teachers learn about integrating ICTs across curriculum

to support learning. There are several global gateways of on-line resources to support teachers' development. These include: ICTs in Education, developed by UNESO, Paris; Education Network of Australia, developed by Education Institute, Adelaide; Institute of Education Technologies in Education, developed by UNESCO, Moscow; and so on. These portals provide opportunities for users to ask questions, post materials, and submit assignments (Anderson, 2004).

Also, ICTs shifts focus from teacher-centred to student-centred learning, where learners are active participants in the learning process, produces share knowledge, participate and learn in collaboration with others. Thus, teachers become learning facilitator, collaborator, coach, mentor, knowledge navigator, and co-learner and not a dispenser of knowledge. This ensures that "learning is an active process in which learners construct new ideas or concepts based on their current/past knowledge" (Kearsely 1994). Cognitive structures form the bases for students to provide meaning and organization to their experiences and go beyond the information given by the teacher or any instructional medium.

In addition, ICT can be multi-media for instructional delivery as instructional contents can be delivered in textual, audio, visual, and audio-visual forms. Thus, equity can be ensured for all categories of learners (learners with disability, geographically disadvantaged, and those who cannot attend regular school, among others).

Several studies have indicated the academic benefit of ICTs in education. Meta analyses have found consistently positive and moderately high achievement gains at all educational levels from computer mediation in school subjects, particularly mathematics (Kulik, 1983). The computer-assisted instruction was found more effective in all educational levels and with lower achieving students (Kulik, 1983; Kulik, Kulik, & Cohen, 1980). Information and communication technologies significantly improve students' problem-solving skills, provide opportunities for student-constructed learning, increase students' collaboration on projects, increase mastery of vocational and workforce skills, increase the preparation of students for most careers and vocations, and improve confidence and attitude of students (Cradler & Bridgforth, n.d). It must be noted that the best predictors for achievement gain in the use of computer were prior positive attitudes towards the technology by teachers and students, consistent access to the technologies, and teacher training in the technology, among others (Maldonado, 2001).

From the foregoing, it can be deduced that ICTs are essential for contemporary educational development of any nation. Nigeria, as a nation, recognizes the pivotal roles of ICTs in the revitalization and the development of the country's education system. This recognition brought about the development of specific ICTs related policies so that the country education system could husband the potentials of ICTs. The policies have spanned over two decades with little or no impact on the Nigerian school system.

Information and Communication Technology Policies and the Nigerian Education System

Although computer entered into the country's education system in the late 70's and early 80's, no concrete policy was evolved for its entry into the nation's education system until the evolvement of the National Policy on Computer Education in 1988 (Federal Republic of Nigeria, FRN, 1988). The 1988 document contained information on the application of computer at various levels of the country's education, and with issues related to basic objectives, hardware and software requirements. The document also comments on teacher training, specifically, for

the secondary school level. The implementation of the policy started with a training programme conducted for 197 teachers from across the country. In addition, computer systems were introduced into the federal unity schools and armed forces secondary schools. However, the initial enthusiasm gave way and little was achieved about the set objectives.

Further impetus for ICT integration in the Nigerian school system came with the 2001 National Policy on Information Technology, tagged "Use IT". It was a major step in the integration of ICT in all facets of the country's life. The document, among others, recommended a start up grant of at least $158m and two percent allocation from the total national budget for articulating the vision of the document. The Nigerian National Policy on IT (FRN, 2001) has within its purview the vision, mission, general objectives, strategies for the implementation of the policy, and sectoral application for all sectors (health, agriculture, tourism, among others. Ironically, education was subsumed under human resource development, the document, in the areas of education, among others, envisaged the development of IT curricula for all levels of Nigerian education, the facilities, and IT dedicated institutions.

Although the document was a step in the right direction, it is inadequate to impact positively on the Nigerian education as the philosophical frame of reference is market driven with little emphasis on the real integration and infusion of ICTs in the country's education system (Yusuf, 2005a). In addition, the document was silent on the education of people with disability and other disadvantaged. The revised National Policy on Education (FRN, 2004) emphasized the need for ICTs at all level of Nigerian education. For instance, the document stated inter alia in Section 11 sub-section 102 (a) that "All states, Teachers Resource Centres, University Institutes of Education, and other professional bodies shall belong to the network of Information and Communication Technology (ICT)" (p. 53). The document noted further in Section 11 sub-section 102 (d) that "Government shall provide facilities and necessary infrastructure for the promotion of Information and Communication Technology at all levels of education" (p. 53). Another major aspect of the document that is ICT related is the national virtual library project aimed at the rejuvenation of the Nigerian schools through provision of easy access to current books, journals, and other information resources using digital technology (FRN, 2004). It must be emphasized, however, that little or no efforts have been made to implement the ideas set out in these 2001 and 2004 documents.

Another major policy document on ICTs use in education was the Ministerial Initiative on Education for the Nigerian Education System (Federal Ministry of Education, FME, 2004). The document contains information on the theoretical framework for e-education in Nigeria, analysis of the Nigerian situation, that is, factors inhibiting or promoting the integration of ICTs in education, components of e-education in Nigeria, e-education blue print, elements of the blue print strategies, decade goals (2015), mid-decade goals (2009) and the action plan, among others. The ministerial initiative document though not encompassing enough to address ICTs integration in Nigerian schools, contained policy statements, which could leapfrog the integration of ICT in Nigerian schools. However, the removal of the Minister of Education who initiated the document, probably accounts for non-implementation of the document. These documents have had little impact on instructional delivery and learning within the Nigerian school system.

Empirical Evidences on the Implementation of ICTs Policy in Nigeria

As noted earlier, the implementation of the 1988 national policy on computer education was precursored by the training of teachers in Federal Unity Schools and Armed Forces Schools. To ensure effective implementation of the 2001 National Policy on Information Technology (IT), the Nigerian Information Technology Developments Agency (NITDA) was established. In addition, the Digital Bridge Institute, in Abuja, was established by the Nigerian National Communication Commission (NCC), to assist in the promotion of ICTs in Nigeria. In spite of all these efforts, ICTs have not impacted greatly on the Nigerian School System. In fact, the impact of ICT is much more noticeable in the economic and communication sectors of the country.

Studies have established positive attitude among educators in Nigeria towards computer education. For instance, Yoloye (1990) in his finding revealed that educationists at the University of Ibadan have positive perception and attitude towards computer and, in fact, would like to be trained to use it. Similarly, most teachers in Nigerian secondary schools have positive attitude towards computer education (Yusuf, 1998). However, empirical studies have established that the level of use of computer among educationist at the University of Ibadan is very low (Yoloye, 1990). Also, it was established that wide gap exists between implementation and requirements outlined in the Nigerian computer education policy (Jegede & Owolabi, 2003). In addition, Jegede and Adelodun, (2003) noted that reasonable computer studies are yet to start in Nigerian secondary schools, the computer-student ratio is small, funding by government has not been encouraging, computer education syllabus is unpopular among students and parents and hardly implemented, and teachers are inadequate to implement computer education. Teachers in Nigerian secondary schools cannot implement computer education because majority of the teachers are not competent in basic computer operation and in the use of simple application software (Yusuf, 2005b). In view of this apparent lack of proper implementation of ICTs at various levels of Nigerian education, it is important to examine barriers militating against effective implementation of ICT globally, as these may serve as lesson for proper implementation of ICT in Nigerian Schools.

Barriers to ICTs Integration in Nigerian School

The world, outside the school system has been able to achieve much in the area of ICT integration in their daily routine. The digital divide between Africa and the developed world is well established in literature. Nigeria ranks 15th, even in Africa in Internet host at 1998 (Hall, 1998), and deprivation in ICT use persists in Nigeria when compared with global standard (FME, 2004). Globally, ICTs implementation in schools has not been smooth sailing. Researchers have been concerned about the barriers that have militated against effective integration of ICTs in education.

Organizations in Africa have been concerned with the problem of poor implementation of ICT in African school. For instance, the Association of African University (AAU, 2000) examined the problem and major obstacles affecting the use of ICT in African universities, and thus defined the problems to be technical, non-technical, human, organizational and financial. Technical obstacles identified include the poor telecommunication infrastructure, absence of national information communication infrastructure, lack of university coherent plan for ICT, problems of connectivity, lack of or limited bandwidth for ICT for learning, teaching, and research, non-reliability of public electricity supply, thus necessitating extra cost for standby generators. The non-technical deals with lack of professional development for faculty, human and organizational

aspect relates to inadequate planning for ICT integration in regular activities of universities, and inadequate human resource base, while financial relates to inadequate funding of ICT infrastructure, maintenance of available facilities, and staff development.

Research findings on barriers to ICT application in other levels of education have provided similar results. Some of the findings of these studies are enumerated as follow. First, is the lack of teacher's confidence and teacher's computer anxiety (BECTA, 2004). Second, lack of teacher's competency due to lack of time for training, lack of pedagogical training, lack of skills training, and lack of ICTs focus in initial teacher training (BECTA, 2004; Yusuf 2005b). Third, there is lack of access to resources due to lack of hardware, poor organization of resources, poor quality hardware, inappropriate software, and lack of personal access for teachers. Fourth, is lack of time to use ICTs as a result of school time table (BECTA 2004). Fifth, there are technical problems which encompass lack of technical support, fear of things going wrong, lack of telecommunication and other infrastructure, and unreliability of electricity (BECTA, 2004).

Others include lack of or ineffective technological leadership in schools, lack of clear vision, lack of incentives for teachers, lack of teachers' participation in planning for ICT integration (Spodark, 2003). Since these barriers are known it is important to device strategies that will provide enabling environment for ICTs use in Nigerian Schools.

Strategies for ICT Integration in the Nigerian Schools

Using the necessary strategies, ICTs can become a major tool for improving the quality of teaching, learning, and research in Nigeria Schools. Given the right condition the potentials of ICT that had been enumerated earlier can be utilized by school administrators, classroom teachers, curriculum developers, researchers, and so on, to improve the administration of the schools and provide sound basis for innovative education in Nigeria. The following initiatives should be taken to encourage ICTs use in Nigerian Schools.

The Nigerian Policy for Information Technology (FRN, 2001) should be reviewed to give specific sectoral allowance for education. The document should not only be market driven in orientation but should also give detailed direction on the Integration of ICTs in instruction. In this direction, relevant stakeholders should be part of the process to review the document. Furthermore, ICTs policy for education should be developed at all levels for Nigerian education. Thus, each state, local government and school administration should evolve ICTs policies as done in advanced countries.

Teachers in Nigeria schools should be trained not only to be competent in the use of ICTs but capable in their use and integration for instructional purposes. Capable teachers, in this context, refer to teachers who know how to learn, are creative, have a high degree of self efficacy, can apply competencies in novel as well as familiar situations, and work well with others (Stephenson & Weil, 1993). Since lack of teacher computer skill is the single largest barriers to ICTs use in education, compulsory ICTs training should be enforced for all teachers, that is, ICT components should become integral part of teacher education programme for pre-service teachers at the colleges of education, universities, and other teacher training institutes, and also for serving teachers. In addition, regular workshops and seminars should be organized for serving teachers to keep them abreast of developments in the field of ICT as they relate to education.

Provision of infrastructure needed for the implementation of ICTs in school should be made and this has several dimensions. In the first instance, schools should be equipped with necessary ICTs facilities as envisaged in the national IT policy. For a start, shared ICT parks can be established for schools within a defined location to use on rotationally scheduled basis. The Nigerian Information Technology Developments Agency (NITDA) initiative in mobile computer laboratory can also be explored. Teachers at all levels should be assisted to acquire personal computer through loans as obtained in other countries. For instance, the British government teacher computer acquisition programme led to increased use of ICTs in British schools (Scrimshaw, 2004). Nigerian teachers should have lap top or palm top computers which can be used at various setting (home, offices, classroom, workshops, etc).

Attempts should be made to develop a crop of school leadership who are committed to ICTs implementation in Nigerian schools. Such leaders will lead others in embracing ICT. School administrators/heads should be part of the people developing ICT issue through projects and initiatives. These leaders will be able to give leadership through knowledge from the multiple training and initiatives. In achieving this, NITDA and the Digital Bridge Institute should develop appropriate programmes for school administrators.

Communities, alumni associations, and significant others should be involved in developing ICTs policies at school level and be involved in the implementation. Working with community will lead to development of a more authentic and conceptualised approach to learning (Scrimshaw, 2004). The community and others can also be involved in the provision of ICTs infrastructure in schools. Locally based training can also be provided for teachers and students by government and educational institutions.

At the initial stage government can evolve community based ICTs, centre with adequate facilities for use of a group of schools. Such centres should have Internet access. The facilities can be opened to the community at a prize to generate fund for sustaining such centres.

There is a need for a national agency to be in-charge of ICTs implementation in Nigerian schools. Such Nigerian Agency for Information Technology in Education shall conduct research into ICTs issues in schools, develop curriculum on ICT for various levels of education, encourage the development of local content software, monitor ICTs implementation at school levels, regulate ICTs specialized institutions, assist states, local government, and schools in developing ICTs policy for education, advice government on ICTs and education, and so on. For instance, BECTA takes care of ICTs issues as they relate to education in Britain.

Teacher-training institutions in Nigeria must develop programmes on ICTs in education, apart from degrees in computer science. Specialist in ICTs in education can thus be developed at various levels. They will be promoters of ICTs use in schools. In addition, teacher-training institutions should encourage further research on ICTs in Nigerian Schools so as to identify the present status, that is, the knowledge map on ICTs in Nigerian schools, the problems, and other sundry issues.

It must be emphasised that research should be conducted nationally on the issue of ICT in schools. Such national researches are regularly conducted in advanced countries to gauge the progress in ICT application in the field of education (BECTA, 2004). Government, non-governmental agencies and organisations, professional organisations in the field of education,

educational agencies and educational research institutes, institutes of education, among others should conduct research on needs, infrastructure, access, digital divide (gender, geographical, social, to mention a few), staff development, barriers to ICT implementation, and so on. Such studies can serve as precursor for adequate planning and they can also serve as evaluation for ICT policy implementation within the Nigerian school system.

From the foregoing it can be deduced that for proper integration of ICT within the Nigerian school system, there is need the Nigerian Policy for Information Technology to be reviewed to give specific sectoral allowance for education and teachers in Nigerian schools should be trained not only to be competent in the use of ICTs but capable in their use and integration for instructional purposes. There is also the need for the provision of infrastructure needed for the implementation of ICTs in school and also crop of school leadership who are committed to ICTs implementation in Nigerian schools should be developed. In addition, communities, alumni associations, and significant others should be involved in developing ICTs policies at school level and be involved in the implementation and research should be conducted on the issue of ICT in schools.

Conclusions

Policy initiatives to encourage use of Information and Communication Technologies in Nigerian Schools, since 1988 have not yielded the needed results. In fact, ICTs have not impacted greatly in improving teaching and learning and serving as a catalyst for change in Nigerian schools. The changes noted through ICTs in Nigerian School are much smaller than expected, in spite of the fact that potentials for real change are great. ICTs are to facilitate teachers teaching and enhance students' learning. It has great potential in educational management and improvement of traditional teaching. With teachers having the needed skills and knowledge, provision of needed infrastructure, ICTs can be of benefit to Nigerian Schools. These potentials can only be exploited when necessary initiatives, some of which are noted in this paper are taken. The initiatives suggested though not exhaustive can serve as springboard for ICTs integration in the Nigerian education system.

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