THE POTENTIALS OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TOWARDS EDUCATIONAL REFORM IN NIGERIA: THE JOURNEY SO FAR

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Abstract

Nigeria, as a nation has recognized the potentials of information and communication technology (ICT) in the school system. This is evident in the educational reform policies aimed at integrating the use of ICT, particularly the computer in the Nigerian school system. ICT has the potential for enhancing the tools and environment for learning as it allows materials to be presented in multiple media, motivates and engages students in the learning process, foster inquiry and exploration, and provides access to necessary world wide information. ICT also empowers the learners with the information technology awareness skills which are essential for success in the contemporary knowledge economy. It can provide opportunities for individuals with disabilities to have access to quality education which is one of the basic goals of the Nigerian educational reform. The paper concluded that ICT offers veritable tools for ensuring the success of educational reform program of the Federal Government.

A common lexicon in the Nigerian education system has of recent, been the issue of educational reforms. As regards its conception, goals and strategies for implementation, it has attracted the attention of all stakeholders. It is apposite from the onset to compartmentalize the major concepts which are essential in the understanding and treatment of reforms within the Nigerian education system. Such terms which need clarifications include: reform, educational reforms and information and communication technology. The term reform is etymologically derived from the Latin root *reformare* which means "to shape". It is a verb that refers to improvement by alteration, a correction of error or removal of defects (Yahoo Education, 2007). Similarly, Young and Levin (1999) defined educational reforms as program of educational change that are government directed and initiated based on an overtly political analysis (that is, one driven by the political apparatus of government rather than by educators or bureaucrats), and justified on the basis of the need for a very substantial break from current practice. Based on the miscegenation of the aforementioned definitions, in this context, educational reforms means Federal government induced and directed substantial alteration of the Nigerian education system (programme curriculum agencies, educational levels, etc.). Information and communication technology (ICT), as a term, is a globally common word. This stems from the penetrating impact of ICT on every facet of human endeavour.

ICT is defined as "a set of activities that are facilitated by electronic means; the capturing, storage, processing, transmission, and display of information" It is also defined by the United Nations Scientific, Educational and Cultural Organization (UNESCO, 2005a) as the combination of the computer, telecommunication, and media technologies. Thus, ICT, as a term is broader than computer. It is the combination of the potentials of computer, telecommunication, and electronic media using the digital technology. Information and communication technology has impacted positively on every aspect of human existence, thereby creating a powerful force for changes in how human beings live, convey information, process information, conduct businesses, and in fact, determine the status

of the nations. Information and communication technology has the potential for not only introducing new teaching and learning practices, but also for acting as a catalyst to revolutionize the education system. It can empower teachers and learners and promote the growth of skills necessary for the 21st century workplace (Trucano, 2005).

Transformational Government is a term which describes the use of computer-based information and communications technologies (ICT) to enable radical improvement to the delivery of public services. The term is commonly used to describe a government reform strategy which aims to avoid the limitations which have come to be seen as associated with a traditional E- Government strategy.

International Initiatives

The early pioneering work by some governments is now being picked up and championed by a range of global organizations which offer support to governments in moving to a Transformational Government approach. For example:

i. The World Bank has set up an e-Transform Initiative (ETI) with support from global IT partners such as Gemalto, IBM, L-1 Identity Solutions, Microsoft and Pfizer. "The e-Transform Initiative is about tapping information technology, expertise and experiences", said Mohsen Khalil, Director of the World Bank Group's Global Information and Communication Technologies Department. "Government transformation is about change management facilitated by technology. This initiative will facilitate the exchange of lessons and experiences among various governments and industry players, to maximize impact and lower risks of ICT-enabled government transformation."

ii. A number of private sector organizations working in this area have published white papers which pull together global best practices on Government Transformation.

iii. OASIS launched (September 2010) a new Technical Committee tasked with producing a new global best practice standard for a Transformational Government Framework. Included in this Framework will be:

1. a Transformational Government Reference Model,
2. definitions of a series of policy products necessary to implement the change,
3. a value chain for citizen service transformation,
4. a series of guiding principles,
5. a business model for change,
6. a best practice delivery roadmap,
7. and a checklist of critical success factors.

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The Nigerian educational reform act of 2007 provides information on wide ranging reforms for the country's education sector. While the conceptual ideas and provisions are laudable, the issue of implementation becomes a matter of concern. This theoretical paper examines the potentials of information and communication technology in the implementation of the reforms. It explores the basic concepts of educational reforms, the nature of the reform, the implementation of previous education reform programmes, and information and communication technology (ICT) in the Nigerian school curriculum. The paper concludes on the need to systematically use ICT to implement the Nigerian educational reforms.

Basic Aspects of the Nigerian Education Reforms

Nigeria on the attainment of her independence on 1st of October, 1960, retained the educational policy bequeathed by the

colonial masters (the British Government). Although Nigeria is a federation (36 federating states), successive governments (democratic and military) operate a unitary or centralized educational system, thus, a single educational system operates in a nation of over 130 million, with over 250 distinct ethnic groups. The first serious attempt at reforming the educational programme of the country took place in 1969, through a curriculum conference held in Lagos, in 1969. The conference brought about radical changes in the country's education system (Fafunwa, 1974). The conference's recommendations led to the first post independent educational policy, tailored to meet the local needs of the nation. The national policy on education (Federal Republic of Nigeria, (FRN, 1977), revised 1981, 1998, and 2004) made radical departure from the educational policy bequeathed by the British colonialist. Other major reform policies include: the Federal Government takeover of regional universities in 1975, the Universal Primary Education Programme of 1976 (Adamu,); the Universal Basic Education Programme of 2000, among others.

The civilian administration of President Olusegun Obasanjo (29th of May, 1999 to 28th of May, 2007) embarked on significant educational reforms particularly at the tail end of the tenure of the administration. These reforms are primed to bring about significant changes in the running of the Nigerian education system. The reforms covered every aspect of the Nigerian education system (grade levels, educational agencies, administration, curriculum, etc.). Over the years educational reforms have been brought about by the need to tailor education towards changing the economic, social, and political situations (Adamu,) in Nigeria. The global changes in the social and economic context (Obioma and Ajagun, 2006) coupled with the economic situation of the country, led to the adoption of National Economic Empowerment and Development Strategy (NEEDS) in 2004. NEEDS, according to Obioma and Ajagun, (2006) have the major targets of value reorientation, poverty reduction, job creation, and wealth generation. This led to the need to re-define the country's education system, as exemplified in the reforms which are meant to move Nigerian education from the theoretical orientation to practical and knowledge orientation. In addition, educational reforms have been embarked upon by the developed, the developing, and the less developed nations of the world. Bello (2007) highlighted some of the major reasons for reforms in education to include the need to: have education relevant to the need of the country, equip students with the relevant knowledge to change their private and professional lives, make education accessible to more people, and pay more attention to science and technology. Others include the desire to: intimate students with contemporary information and communication technology skills, equip schools with adequate resources, improve teaching methods and educational practices, improve financing and management of education, improve the school assessment system, and prepare the citizens of the country to face the challenges of globalization.

The major influence of globalisation is further emphasized by Carnoy (1999). Globalisation, as analysed by him has affected the education system directly and indirectly. According to him globalisation has led to:

iv. Changes in both the labour market and the education systems due to the increasing demand for skilled labour.
v. The demand for additional resources for education in a policy environment that is not receptive to the expansion of the role of the public sector in education.

vi. The decentralization and privatization which are considered strategic for ensuring quality and flexibility in a global economy, as exemplified in global market and global skills.
vii. The increase in cross-national measurement of education system.
viii. The adoption of information and communication technology for increased access to education and also for quality in education.
ix. The transformation of culture and cultural values, thereby resulting in what Carnoy (1999) called "struggle over the meaning and value of knowledge"

Carnoy (1999) went further to highlight specific aspects of the impact on globalisation as bringing about competitiveness driven reforms (decentralization, standards, and improved management of educational resources, improved teacher recruitment and training), finance driven reforms (shifting public funding from higher to lower levels of education, the privatization of secondary and higher education, the reduction of cost per student at all schooling levels), and equity driven reforms (to reach those who are not accommodated by the contemporary education system – lowest income group, women and rural population, minorities, etc).
The Nigerian Education Reform Act (Federal Ministry of Education, [FME], 2007) contains four major parts:

Part 1 deals with the preliminary issues, Part 2 which contains the main provision has 13 major chapters dealing with: Basic and Secondary Education Commission, Tertiary Education Regulatory Commission, National Education Resource Commission, National Examination Certification Council, National Business and Technical Examination Board, National Examination Council, West African examination Council, Joint Admission and Matriculation Board, National Library and Information Centre, Special Education Commission, National Mathematical Centre, Teachers Regulatory Council of Nigeria, and Education Trust Fund. Part 3 contains administrative provisions, and Part 4 deals with the final provision.

Major changes from earlier educational policies are enunciated as follows. First, the nine-year basic education eliminates disconnection between the primary and the Junior Secondary School thereby ensuring a continuous curriculum (Obioma and Ajagun, 2006). The level is structured into three levels:

Lower Basic (Primary 1 - 3), where 8 core subjects and a maximum of 2 electives are offered;
Middle Basic (Primary 4 - 6), where 9 core subjects and a maximum of 3 electives are offered, Upper Basic (Junior Secondary 1 - 3), where 10 core subjects and a maximum of 3 electives are offered.
Secondly, the need to reform secondary school education is supported by several UNESCO researches which emphasized the need to take secondary school education beyond the General Secondary School Education (GSE). It is to incorporate Technical and Vocational Education Training (TVET) which is called the convergence of knowledge and practical skills (UNESCO, 2005b).

Thirdly, the consolidation of tertiary institutions and merging of tertiary institutions, that is, the merging of Colleges of Education and Polytechnics with Universities was envisaged. Other basic areas included the merging of educational commissions and agencies from over 30 to 11, targeted at reducing redundancy and ensuring quality service delivery.

Previous Educational Reforms and Implementation

In spite of the promises of the education reforms, the salient question is, can the reform be implemented successfully? Previous educational reforms had been implemented half heartedly or

abandoned at its inception. A few examples will suffice. Although the implementation of the 6-3-3-4 system of education commenced in the early 80's most institutions could not effectively implement the introductory technology aspect, due to lack of manpower, equipment, and lack of leadership. The computer education programme, launched for secondary schools in 1988, never succeeded. A study by Jegede and Owolabi (2003) revealed the wide gap between the policy and its implementation. In another study, Yusuf (2005a) revealed that most secondary school teachers were not competent in basic computer operation and the use of generic soft ware. Several reasons adduced for the lack of success in the implementation of past reforms include: inconsistency in government policy and lack of political will to effect lasting solutions to educational problems, lack of required personnel resulting from lack of training back up when policies are designed, inadequate funding, top down approach to the development of educational reforms, lack of proper monitoring, over emphasis on paper qualification instead of placing such on productive marketable skills, and so on (Adamu, Bello, 2007 in Yusuf, 1998). In fact, the current reforms started by the last administration are already being questioned by the present administration in Nigeria. In fact, the Minister of Education, after his assumption of office, announced that some of the reforms introduced will be reversed. Specifically, on the 28th of August, 2007, the Minister announced that the Federal Government had suspended the series of reforms initiated in the education sector during the Obasanjo administration (Nzeshi, 2007).

Information and Communication Technology in the Nigerian Education System

Nigeria, as a nation, has recognized the potentials of information and that of information and communication technology in the school system. This is evidenced in the educational reform policies aimed at integrating the use of ICT, particularly the computer, in the Nigerian school system. The first national programme was the Federal Government 1988 policy document, National Policy on Computer Education (FME, 1988). The document emphasised the need for primary school pupils to be introduced into basic computer skill, the use of the computer to facilitate learning, and rudimentary use for text writing, computation and data entry. For secondary schools the goals were as identified for primary schools, but to be pursued at a higher level. The additions were the organisation of curriculum for secondary school students on computer education, and the decision to use the unity schools as the pilot institutions for computer education. The tertiary institutions were also required to teach computer science as a subject discipline, and also integrate it in the school administration and instruction. Other components of the document include; equipment requirement, teacher training, and specific recommendation on different tertiary institutions. However, as noted earlier, the implementation was not effective. The national policy on education (FRN), as revised in 1998 and 2004, re-emphasised the need for the integration of ICT in the Nigerian education system. For instance, the 2004, 4th edition, again emphasised the need for the introduction of information and communication technology into the school system. This is an acceptance of the need to go beyond computer to the level of ICT, and also the need for infrastructure.

The first holistic attempt at introducing ICT in all facets of the country's life was the approval by the Federal Government of a national policy on ICT. The Nigerian national

policy for information technology (FRN, 2001), recognised the need for ICT to be used for education, and three major objectives among several objectives emphasized the need to: empower youths with ICT skills to prepare them for competitiveness in a global environment, integrate ICT into the mainstream of education and training, and establishment of multifaceted ICT institutions as centers of excellence on ICT. The document specifically noted the need for "Restructuring the education system at all levels to respond effectively to the challenges and imagined impact of the information age and in particular, the allocation of a special IT development fund for education at all levels". To achieve these objectives, nine major strategies were outlined, these include: making the use of ICT compulsory at all educational institutions, developing of ICT curricular for all levels of education, using ICT in distance education, and ICT companies' investment in education. Others include giving study grant and scholarship on ICT, training the trainers' scheme for Youth Corp members on ICT, ICT capacity building at the zonal, state, and local government levels, establishing private and public dedicated ICT institutions, and working with international and domestic initiatives to transfer ICT knowledge.

However, Yusuf (2005b) noted in his analysis of the Nigerian national policy for information technology (FRN, 2001) that the policy was inadequate for positive impact on the Nigerian education system. This, he noted, stems from the fact that the philosophical frame of reference is market driven, and that there is little emphasis on the integration of ICT in instruction. It should be noted that none of the policy documents, national policy on computer education (FME, 1988), national policy on education (2004, 4th ed.), and the Nigerian national policy for information technology (FRN, 2001), recognized the need to use the computer or ICT to provide access to education for people with disability. This underscores a major inadequacy in the policy document. In addition, strategies outlined in the document were not followed. Another significant document on ICT was the Federal Ministry of Education (FME, 2004) Ministerial Initiative one-Education for Nigerian Education System. Unlike the previous documents, the initiative was drawn based on input from major educational and human development commissions and board (National Universities Commission, National Colleges of Education Commission, National Board for Technical Education, Education for All, Universal Basic Education, etc.). Also, for the first time, the need to integrate ICT in special education, particularly for people with disability was emphasised. However, the document could not be implemented because the Minister who initiated the document was removed. Thus, signaling the death of the document which was meant to leapfrog the Nigerian educational institutions into ICT compliant ones. Since then, no national document had been developed on the integration of ICT in Nigerian educational institutions.

Potentials for Information and Communication Technology in the Implementation of the Nigerian Educational Reforms

The potentials for information and communication technology to improve the quality of instruction, transform the school, improve school management, increase access to education and improve teacher education, among others, have been emphasized in several studies. Information and communication technology has the potential for enhancing the tools and environment for learning as it: allows materials to be presented in multiple media, motivates and engages students in the learning process, fosters inquiry and exploration, and provides access to world wide information resources, among others

(Haddad, 2003). However, researches have been inconclusive on the expectations regarding the value of ICT (Carnoy, 2004 in Trucano, 2005).

The educational reforms act of 2007 (FME, 2007) clearly highlighted the need to: improve the quality of instruction in Nigerian schools, provide enriched learning environment, need to provide more access to education, and provide the students with knowledge and skills necessary for the 21st century work place, among others, as the motivating factors for the educational reforms. It must be underscored that information and communication technologies will assist in ensuring the achievement of these goals of the educational reforms. In specific terms, manpower that are competent and constantly given developmental training will be required for the success of the reforms. First, ICT can be relevant in the teachers' professional development, to make them guides to sources of knowledge. Teachers in contemporary knowledge society require large, rich, and easily accessible- knowledge base which can be provided through ICT technologies that support teacher professional development (Gallimore and Stigler, 2003). Teachers need to be life-long learners to keep abreast of new knowledge, pedagogical ideas, and technology (World

Bank (2003), relevant to successful implementation of Nigerian educational reforms. Through the digital libraries, virtual institutions, and other Internet resources, teachers can easily have access to relevant and current resources in their areas. Thus, they must be competent in the use of ICT to husband its potentials. Secondly, the quality of students' learning will be enhanced through their access to the needed content through ICT facilities (especially, the Internet). Information and communication technology can enhance learning by doing, and increase the information available to learners, thereby engendering collaborative learning (World Bank, 2003). Information and communication technology can also empower the learners with information technology awareness and skills which are essential for success in the contemporary knowledge economy (Kante, 2003). Thirdly, ICT provides new frontiers for providing access to basic education for disadvantaged children and youth excluded from the formal school system. As modern ICTs are attractive to children and youth, they provide unmatched learning opportunities for them to learn within and outside the formal school system. They are powerful motivational tools for learning through games, exploration, collaboration, and learning work-related skills (Fillip, 2002). Distance learning enhanced through ICT can provide flexible learning opportunities with collaborative aspects and rapid communication among learners and between the learners and academic mentors (World Bank, 2003).

Also, ICT can provide opportunities for individuals with disabilities to have access to quality education, (one of the basic goals of the Nigerian educational reform). They can be relevant as assistive technology, adaptive technology, and as a tool for knowledge and support (Jurich and Thomas, 2002). Assistive ICT encompasses not only computerised technologies but also a powered wheel chair with voice command and other computer technologies which can increase mobility for persons with severe neuromuscular limitations. Adaptive ICT include keyboards with colourful keys for persons with learning disabilities, voice recognition, and the accessible web accessibility option initiative of the W3 Consortium which are designed to provide web access for people with disability. Thus, ICTs are opening new doors for people with disability to have enhanced access to

education in conventional and distance education settings (Jurich and Thomas, 2002). Evaluation of education reform implementation is essential at the macro, meso, and micro levels of the Nigerian education system. At the macro level, educational reform implementation is evaluated at the national level in terms of wholesome national objectives. At the meso level, educational reforms are evaluated at the institutional or school level. The evaluation is based on the institutions' needs, objectives, and resources. At the micro level, reform is evaluated in the classroom in terms of the available resources, how often these resources are utilised, and the level of achievement of educational goals and objectives. Information and communication technology can assist in evaluation at these levels in several ways. One of the basic problems affecting educational reforms in Nigeria is the problem of centralized database on implementation and networking of research efforts. Through ICTs, research results of educational institutions can be centralised and disseminated for national or specific contextual application. In addition, information and communication technologies are essentials in the sensitization of Nigerians, particularly educational stakeholders on the nature and aspects of the educational reforms, the resources and needs for its proper implementation, and the evaluation of the reforms, among others. It is possible to promote institutional linkages, collaboration between various stakeholders, and dissemination of information on educational reforms through ICT. Information and communication technology, on their own, cannot ensure the success of the Nigerian educational reforms.

These potentials of the ICT in the implementation of the Nigerian educational reforms are only possible through adequate planning and proper integration. That is why; Aniebonam (2007) offered ten major interventions which, he believed, would assist in integrating ICTs in driving educational reforms in Nigeria. These are: provision of infrastructure (cyber centers, classrooms buildings, offices, etc.), institutional network (LAN, WAN, WiFi), systems and applications (Internet, learning, education portals, etc.), capacity building, digital library, technical support in institutions, computer ownership scheme (for students, teaching and non-teaching staff), ICT content career development scheme, International Examination Digital Centre (IDEC)(,) and continuous power supply. Intervention programmes on ICTs capacity building as being currently done by the Education Trust Fund and the Digital Bridge Institute, Abuja, should be strengthened. In addition, academic and non academic staff members at the lower levels of the country's education system should be involved in such capacity building. It should be underscored that necessary stakeholders should be involved in the development of ICT software with local contents to ensure the domestication of ICT within the Nigerian school system. For instance, the curriculum specialists recommended that there is the need for computer education to be included in the basic education programmme as a core subject and not as an elective subject (Obioma and Ajagun, 2006). Finally, a certain percentage of the national budget should be set aside to promote ICT in the Nigerian school system, as outlined in the 2001 Nigerian national policy on information technology.

Conclusions

Information and communication technologies offer veritable tool for ensuring the success of the educational reform programmes of the Federal Government. The value of ICT is globally recognised. However, there is a big gap in ICT skills between average Nigerian student and teaching staff and students and teaching staff of comparable economies around the world (Aniebonam, 2007). The government and

individuals need to address this technology gap so that Nigerian citizens can compare globally with others. Nigeria, as a nation, and Nigerians as citizens, are never in want of policies, but always go shorts of policy implementation. The potentials for information and communication technologies should be exploited to ensure the success of educational reforms.

Recommendations

We must rise up to the challenges in order to be able to make our ICT sector very viable. In order to achieve this goal and compete in the world, then we must work together to ensure that:

x. We enhance our communication Networks, by Enabling more websites, discussion forums, blogs and Mobile to impart on the General public the application & advantages of ICT on our physical, health, social and commercial life.

xi. ICT Education should be woven through the entire Education System of our country, starting from the Primary up to the tertiary institutions.

xii. The present Governments want to Bring Back the Book and ensure that Nigerians imbibe the Habit of Reading, the writer will suggest that Nigeria Should have its National and State Libraries Automated with Integrated Library Systems. This will enable a lot of people to have access to learning content through more channels e.g. Internet & Mobile Phone.

xiii. NCC should be more open on its policy to ensure that internet reaches at least 70% of Nigerians, by committing to enabling private investors to partner with them to provide such services at very cheap rates.

xiv. Nigerian Government and Private institutions should patronize Nigerian contents, such as Softwares, Applications, Hardware & Networking and Maintenance.

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