

APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN NIGERIAN EDUCATION: ISSUES AND CHALLENGES

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Abstract

The rapid spread of Information and Communications Technologies (ICT) is changing the way economic and social development occurs in most countries. ICT tools can make institutions and markets more productive, enhance skills and learning, improve governance at all levels, and make it easier for the poor to access services and make their voices heard. Its use to further developmental goals is also evolving: Citizens can apply for admission into institutions of learning online, techniques to boost crop yield or improve well-drilling can be sent instantly around the world and health specialists can more effectively coordinate to halt the spread of diseases. The application of ICT is freeing millions of bright minds to work together in ways never before possible to bring about development. This paper presents a review of ICT, its contributions to development, and the imperative for an improved educational usage of ICT tools in managing current global challenges.

Introduction

Information and Communication Technology (ICT) is one of the important driving forces for modern development. With the advancement of Information and Communication Technology, one can live in the global village irrespective of distance, national and international boundaries. The term Information and Communication Technology (ICT) springs from the convergence of telecommunication, computing and broadcasting through the use of digital information. It covers any product that can store, retrieve, manipulate, transmit and receive information electronically in a digital form. ICT comprehends technologies that can process different kinds of information i.e. voice, video, text, data and facilitates different forms of communications among humans and among information systems. The telecommunication infrastructure plays an important role to boost the development of a country in this information society. The advent of ICT brings all the citizen of this planet close together and has a quicker access to all the information and benefits that the world may have.

The use of ICT by developing countries, especially Nigeria, has grown divergent over the years. Initially, the dominant perspective in developing countries has been one of promoting growth of ICTs as one of the key sectors of a country's economy. The ICT sector presents a great opportunity for them to enhance economic growth and employment by way of buying and the assembling of computers and its accessories to replace the typewriter as typified by Nigeria.

However, a second perspective that has emerged in the last couple of years and that has come to stay is the deployment of ICT, especially the Internet, as catalyst for national development. As in richer nations, this once unimaginable resource is being harnessed, along with other Information and Communications Technologies (ICTs), to improve education, health, agriculture, governance, and business — sometimes in surprising ways (Tinio, 2003).

Contributions of ICTs to National Development

This will be discussed under the following headings:

- E-government
- Procurement Reforms
- Education & Sharing Knowledge

(a) E-government

E-government refers to the use of ICT to improve the efficiency, effectiveness, transparency and accountability in the delivery of government services. Improvement in delivery of Government services is an important issue for many developing countries as the largest cost of inefficiency is borne by the poor. Electronic delivery can improve efficiency, cut delays for citizens, lessen corruption, and increase transparency. Applications that focus on online delivery of services to citizens, businesses, and different arms of government are covered within the broad definition of electronic government. E-government is about a process of reform in the way Governments work, share information and deliver services to external and internal clients. Specifically, it harnesses ITs (such as WAN, the Internet, and mobile computing) to transform relationships with citizens, businesses, and other arms of government. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, better information for planning, spending, serving and cost reduction.

Various Applications and Delivery Models of E-government: Applications for e-government to improve governance are myriad. They can be categorized according to the constituency that is served:

- (i) Delivery of services to citizens**
- (ii) Delivery of Services to Business and Industry**
- (iii) Increased Efficiency of Departments/ Govt. Enterprises**

Three distinct delivery models are used in most cases:

Departments going on-line: Here citizens interact with departments/private operators by accessing data and information from on-line terminals located in the premises of the department. Examples of these include the Delta State Project e-delta and the Delta Sate Board of Internal Revenue.

Conveniently located Service Centers in public places: Here multiple services are offered at each location: payment, issue of licenses and certificates, etc. Examples include Banks and other locations used by the Lagos State Internal Revenue Service.

Self Service through a Portal: The portals are designed to offer a variety of services and the interface is organized in a fashion that makes it convenient for citizens to access the services. This is currently in use here in Nigeria by higher institutions of learning, including the Military for admission purposes, the Customs for international passport and many private organizations for employment purposes.

(b) Procurement Reform

In the routine details of how a government award contracts to build schools, drill water wells, or buy vehicles, can be found some of the greatest opportunities for saving public resources and promoting a more dynamic private sector in developing countries. Even small efficiency gains can mean freeing up millions of naira for education, building roads, or social programs to help the poor. Unfortunately, procurement systems in many developing countries are extremely inefficient. Lack of capacity to process and manage tenders, and lack of internal and external transparency in the competitive system can be important factors. Moreso, in any country at any stage of development, the

large amounts of money involved can make procurement systems prone to corruption. Public procurement reforms therefore, is borne out of the need to shed light on government spending, increase efficiency, reduce costs and corruption in government procurement process.

E-procurement: According to the BNET Business Dictionary, e-procurement (also known as Electronic Procurement) is the business-to-business sale and purchase of goods and services over an electronic network such as the internet.

The chartered Institute of Purchasing and Supply (CIPS) defined it as the using of the internet to operate the transactional aspects of requisitioning, authorizing, ordering, receipting and payment processes for the required services or products.

Simply put, it is the use of electronic systems to purchase goods, works and services and process payments; a system that utilizes the Internet technology to streamline the purchases of goods and products to reduce costs.

Employing ICT is a critical element for procurement reform. The results are immediate and impressive. With an initial investment of \$26 million to install an e-procurement system, Korea saved \$2.5 billion a year; ICT-based procurement reform in the Philippines education sector saw the price of school textbooks drop in half and the cost of classroom construction fall by 40 percent (Development Gateway Foundation, 2007). Development Gateway Foundation is of the opinion that though it is not every country that is ready for a full e-procurement system or that can spend millions of dollars to get one, studies has shown that simply increasing access to information about tender opportunities via the Internet can increase the number of bidders, with dramatic cost-saving results, thus giving government affordable options, increasing the efficiency of the system and saving cost.

(c) Education & Sharing Knowledge

For developing countries, ICTs have the potential for increasing access to and improving the relevance and quality of education while at the same time ensuring that the convergence of the two technologies works for every one through increased educational and business usage. It thus, represents a potentially equalizing strategy for developing countries. This is aptly captured by Tinio (2003) thus:

“[ICTs] greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and for the poor. One of the greatest hardships endured by the poor, and by many others who live in the poorest countries is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago. However, the reality of the Digital Divide—the gap between those who have access to and control of technology and those who do not—means that the introduction and integration of ICTs at different levels and in various types of education will be a most challenging undertaking. Failure to meet the challenge would mean a further widening of the knowledge gap and the deepening of existing economic and social inequalities.”

Current Global Challenges

The world now faces a series of challenges and crisis such as climate changes, food, water, peace, financial etc. According to The Millennium Project, there are 15 interdependent global challenges facing humanity, which they believe are crucial questions for policy action now and in the next decade and if timely and wise decisions about them are taken, will set the course of global development and societal achievements in the years immediately ahead. These are typified below:



Source: Adapted from the Millennium Project

Challenge no. 6 has to do with the global convergence of ICT. The questions are: what is the role of ICTs in addressing these challenges? How can we use ICTs to support the work of the international community in crisis areas? How can ICT strengthen the crisis management capacity of the international community and find solutions to global crisis? In essence how can the convergence of Information and Communication Technologies work for everyone?

The Imperative for an Improved Educational Usage of ICT Tools in Managing Current Global Challenges

According to the Millennium project, the internet and mobiles phones are merging. The internet is evolving from a passive information repository, through user-generated and participatory system to a more intelligent partner with a collective intelligence and just-in-time knowledge, thus making it the most powerful force for globalization, democratization, economic growth and education in history. Its features that qualifies the above description includes:

- (a) Its ability to transmit wirelessly, making it possible to be mobile, while covering wider range;
- (b) Its access in local and remote areas in developed world as a result of (a) above;
- (c) The manufacture of cell phones with internet facilities making it possible for e-mails, instant messaging and collaborative software (Video-conferencing, etc) to link groups of people in humanitarian, scientific and business projects;
- (d) Multimedia growth in the internet, which has given birth to multimedia approach to learning (using several different ways of giving information).

The features above is a true reflection of the fact that “ the information revolution and extraordinary increase in the spread of knowledge have given birth to a new era-one of knowledge and information which effects directly on economic, social, cultural and political activities in all regions of the world, including Africa” (Ogunsola, 2005). Governments worldwide have consequently recognized the role that ICTs could play in socio-economic development. According to Ogunsola (2005), a number of countries especially those in the developed world and some in the developing countries are putting in place policies and plans designed to transform their economies into an information and knowledge one (in the words of the 6th global challenge, making the convergence of ICT work for everyone), which in the case of most developing countries like Nigeria, must start with an improved educational usage of ICT tools. This is, because, ICTs can help in the management of current global challenges in the following ways:

- (i) ICTs help expand access to education: ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints, are unable to enroll on campus. This is as a result of two distinct features of ICTs viz:
 - their ability to transcend time and space (Anytime, anywhere)
 - access to remote learning resources, as teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (with restricted access and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media, can now be accessed from anywhere at any time of the day and by an unlimited number of people.
- (ii) ICTs helps improve the quality of education: ICTs can enhance the quality of education in several ways:

Motivation to learn: ICTs such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise, makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, networked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.

Facilitating the acquisition of basic skills: The transmission of basic skills and concepts that are the foundation of higher order thinking, skills and creativity can be facilitated by ICTs through drill and practice. Some educational TV programs use repetition and reinforcement to teach the alphabet, numbers, colors, shapes and other basic concepts. Most of the early uses of computers were for computer-based learning that focused on mastery of skills and content through repetition and reinforcement.

Enhancing teacher training: ICTs have can be used to improve access to and the quality of teacher training. For example, teacher training centers can take advantage of the Internet to provide better teacher professional development opportunities to in-service teachers by offering self-directed, self-

paced Web-based courses for primary and secondary school teachers without necessarily disrupting their teaching activities.

(iv) ICTs help prepare individuals for the workplace: One of the most commonly cited reason for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the Internet and related technologies, are becoming more and more ubiquitous. According to Tinio (2003), EnGauge of the North Central Regional Educational Laboratory (U.S.) has identified what it calls “21st Century Skills,” which includes digital age literacy (consisting of functional literacy, visual literacy, scientific literacy, technological literacy, information literacy, cultural literacy, and global awareness), inventive thinking, higher-order thinking and sound reasoning, effective communication, and high productivity. The table below shows a brief explanation of each skill.

Table 1: Skills Needed in the Workplace of the Future

Digital Age Literacy	
Functional Literacy	Ability to decipher meaning and express ideas in a range of media; this includes the use of images, graphics, video, charts and graphs of visual literacy
Scientific Literacy	Understanding of both the theoretical and applied aspects of science and mathematics
Technological Literacy	Competence in the use of information and communication technologies
Information Literacy	Ability to find, evaluate and make appropriate use of information, including via the use of ICTs
Cultural Literacy	Appreciation of the diversity of cultures
Global Awareness	Understanding of how nations, corporations and communities all over the world are interrelated
Inventive Thinking	
Adaptability	Ability to adapt and manage in a complex, interdependent world
Curiosity	Desire to know
Creativity	Ability to use imagination to create new things
Risk-taking	Ability to take risks
High-Order Thinking	Creative problem-solving and logical thinking that result in sound judgment
Effective Communication	
Teaming	Ability to work in a team
Collaboration & Interpersonal Skills	Ability to interact smoothly and work effectively with others
Personal & Social Responsibility	Be accountable for the way they use ICTs and learn to use ICTs for the public good
Interactive Communication	Competence in conveying, transmitting, accessing and understanding information
High Productivity	Ability to prioritize, plan and manage programs and projects to achieve the desired result; ability to apply what they learn in the classroom to real-life contexts to create relevant, high-quality products

Source: Adapted from Tinio (2003).The ICT in Education.

The potential of ICTs to promote the acquisition of these skills is tied to its use as a tool for raising educational quality.

Problems and Prospects

The use of ICT tools in managing current global challenge is however fraught with some problems. These are enumerated below:

1. Internet facilities are not widely available in most developing countries, especially in the local and remotes villages.
2. Where they are available, the facility (including the cost of computers) is so expensive that the poor cannot afford it. In most cases students and the poor go to cybercafé, where (in Nigeria) they stand the risk of being arrested as “419ners”.
3. There is lack of flexibility as a result of the non-ability to employ local languages in educational contents targeted at specific communities. Thanks to Goggle.com where searches can now be made in Hausa, Yoruba, Ibo and other languages.
4. There is the issue of under-utilisation of computers in many schools in developing countries.
5. Lack of computer literacy: Even when computers are available, not all are computer literate.

The solutions to the these problems lies in deliberate government policies geared and designed to transform the economy into an information and knowledge one by

1. Making internet facility available in all areas (both local and remote), at affordable prices, if not free. This can be done by the deployment of mobile internet centres (e.g. Vans), and community telecentres (maybe based in schools).
2. Making efforts to lower the cost of acquiring internet facility (computer inclusive) via local manufacture/development of hardware/software components.
3. The adoption of local languages in educational contents and web sites.
4. According to Ogunsola (2005), government should carefully guide the growth of ICT through government policy, while at the same time, make effective use of the ICT in the performance of its legitimate functions.
5. Encouraging its populace to make voluntary attempts at being computer literate.

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