

PROMOTING EDUCATIONAL CHANGE AND SUSTAINABLE DEVELOPMENT THROUGH ICT IN NIGERIA

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Abstract

The paper examines how Information and Communication Technology can promote educational change and sustainable development in Nigeria; this can be promoted through acquiring ICT skills in various ways which include: software development commercial outfit, computer training, maintenance, networking and internet service as well as enhancing teaching and learning activities. Globally, the impact of Information and Communication Technology (ICT) in the past decades has been enormous. ICT plays a crucial role in socio-economic development and in bringing the world together as a global village. The paper argued that the possible challenges of implementing ICT includes lack of maintenance culture, budgetary constrain, and infrastructure related problems. It was suggested that the Federal Ministry of Education should work with the Federal Ministry of Science and Technology to develop a special training scheme for technical personnel for implementing the ICT in Education policy. Government should also provide adequate fund for ICT facilities maintenance and otherwise.

One of the problems that are facing developing countries today is sustainable development. Information and Communication Technologies (ICTs), which include radio and television, as well as newer digital technologies such as computers and the internet have been touted as potentially powerful and enabling tools for educational change and sustainable development. When used appropriately, different ICTs are said to help expand access to sustainable development. Strengthening the relevance of ICT in education; organization (both private and public sectors) will lead to the success of achieving goals and objectives for self-reliance. ICTs stand for information and communication technologies which can be defined as a “device/set of technological tools and resources used to communicate and to create, disseminate, store, and manage information” These technologies include computers, the internet, broadcasting technologies (radio and television), and telephony. (Blurton, 2011).

The term “ICT” describes the use of computer-based technology and the internet to make information and communication services available to a wide range of users. The term is used broadly to address a range of technologies, including telephones. Central to these is the internet, which provides the mechanism for transporting data in a number of formats including text, images, sound, and video. Additionally, ICT deals with the application layer, the systems that enable information to be collected and distributed, analysed, and processed. ICT is an integration of technologies and the process to distribute and communicate the desired information to the target audience and making the target audience more participative in nature. The term ICT also refers to: information channels such as the World Wide Web, online database, electronic documents, management and accounting systems, intranet, communication channels such as e-mail, electronic discussion groups, electronic conferences, the use of cell phones, etc. hardware and software used to generate, prepare, transmit, and store data, such as computers, radio, TV, computer programmes/tools, etc. (International Institute for Sustainable Development

Information and Communication Technology (ICT) is the most attractive tool; for successful development of the education sector and industries that would facilitate craftsmanship in business world for the younger generation. Information and communication technology is not only regarded as a vital instrument of socialization and reform but as a means of laying solid foundation for strong and variable

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business world. It is the bed rock for business survival and development in a rapidly changing economy. Information and Communication Technology facilitate global connectivity resulting in new ways of creating and delivering products and services globally

Business education should be a true reflection of the technological world with the aim of preparing the youths for useful living in the society. There is therefore, the need to rethink towards gaining relevant information and communication technology skills, knowledge, and establishing networks for economic development. Evans (2002) described information and communication technology as the acquisition, processing and dissemination of information by a micro-electronic based combination of computing and communication. Information and communication technology may therefore be defined as the process involved in gathering and processing information through computer and other related equipment to reach the desired places and people at a reasonable cost and time to the overall benefit of mankind.

ICT and Educational Development

In the 21st century, an ability to work with information and communication technologies is becoming as essential to education, life and workplace success as reading, writing and arithmetic. Several factors contribute to the poor level of education in Nigeria, one being poor management and in some cases the **total** abandonment of the sector for decades. Education in Nigeria hasn't always been as bad as it is presently. In the 70's, Nigeria boasted of the best universities in Africa, Nigerian schools were rated and well known around the world in the 60's, 70's and early 80's. Teaching and learning was robust and infrastructure was adequate. Nigerian students excelled and earned reputable certificates recognized world over.

Those good days are far-gone as shown in both local and international statistics. Years of military rule practically destroyed the education system in Nigeria and brought it to its lowest ebb. The poor attitude shown by the leaders towards education in this democratic dispensation set the countries education years back. Many have graduated from primary, secondary and higher institutions in the country without being educated. Issues plaguing the system today range from poor educational infrastructure, inadequate funding, poor quality of teachers, lecturers and administrators, poor delivery of educational content, non-conducive learning environments, increasing cost of education etc. These factors do one major thing; they destroy the fabric of potential growth as a nation. Students are not tasked to think, they are not inspired to innovate, and students can't apply what they learn in school to affect their immediate environment. Nigerians have not been able to use education to solve local problems facing them because ingenuity, independent thinking and creativity are stifled. It is glaring to see Nigeria churn out more zombies than the educated from Nigerian educational institutions every year.

The wide gap between the ICT sector and the Academic sector makes graduates of tertiary institutions in the country to engage themselves in professional examination of various kinds, given the current national crusade by the government towards creating awareness on the relevance of information technology to education and economic growth. When Nigerians have students from the educational sector, they don't really fit in into the ICT world. Most of them have to go through a lot of professional exams before they can fit in, so this is avenue for the industry and the students to interact so as to bridge the gap."

Nigerians are decades behind in their level of quality of education and quantity of the educated compared to the rest of the world. There are universities in Nigeria today offering computer science as a course that requires students to study and pass archaic and forgotten programming languages nobody in the world uses anymore. Nigerian graduates today get jobs in their fields they have spent years to study but have to be retrained before being employed; many don't even get jobs in their chosen fields and become square pegs in round holes trying to fit in, because they really can't apply themselves. Sadly

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many students today just want to collect a certificate that shows they attended school because that's all they can have given their circumstances.

Objectives of ICT for Sustainable Development

1. To develop high-end entrepreneurship using IT methods, tools and infrastructures.
2. To network agencies, academic institutions and organizations to create a support system for ICT skills and development.
3. To act as a policy advisory body for ICT development
4. To facilitate and conduct various information services relating to promotion of ICT skills.

Furthermore, according to Saidu A, Soba, B. M., & Tukur, (2009), the objectives include:

1. To actively facilitate e-learning and teaching in the manner that the goals of sustainable development could be promoted.
2. To encourage creative and integrative teaching and learning which ensures that learning becomes student focused and ideas as well as individual initiatives are directed towards various learning pathways so as to achieve the national development goals of developing countries
3. To ensure easy access to educational materials, high quality data, information and knowledge as well as research findings relevant to the problems of developing countries.

Concept of Sustainable Development

According to Ayodele, (2007), sustainable development can be broadly defined as the ability of the economy to support the needs of the people of a country over a time, taking into consideration the economic, social and ecological constraints of the country. The fundamental concept is "sustainable requirement," namely that the fulfilment of the needs of the present generation should not compromise the ability of future generations to meet their own needs. Furthermore, ICT for sustainable development on the other hand represents a catalytic process for social change that seeks to foster through education training and public awareness-the values, behaviours and lifestyles required for sustainable future. It is about learning needed to maintain and improve the quality of life of generations to come. It is about individuals, communities, groups, business and government to live and act sustainably; as well as giving them an understanding of the environmental factor, good moral behaviours and economic issues involved (Ayodele, 2007)

Challenges of ICT for Promoting Sustainability Development

ICT is one of the tools that are used in promoting sustainability development in both developed and developing countries. Nevertheless, there are some challenges facing the integration of ICT effectively. The significant challenges are outlined below:

Lack of Maintenance Culture: ICT facilities need regular maintenance in order to sustain their maximum life span. Unfortunately, most of the developing countries neglect maintenance culture and this seriously affects ICT equipment.

Lack of Time and Resources: Staff lacking the time to deal with the challenges of sustaining ICT facilities, which is time-consuming. IT departments already face increasing demands from their institutions, without a commensurate increase in staff. Many of the programming changes required to implement sustainable ICT require considerable technical skill to implement. This constraint will become less pressing as staff becomes more familiar with the issues.

Budgetary Constraints: Many government parastatals and tertiary institutions feel they are under-funded, and lack of capital budget means there is not enough money to spend.(European Journal of Computer Science and Information Technology 2014)

ICT Facilities and Activities: Most capital budget for ICT has to be spent on activities that contribute to immediate goals. Universities and colleges are further disadvantaged because they misuse priority in their dealings. Savings from energy efficiency measures will result in lower operational costs, but normal budgeting systems make it difficult to transfer money saved from operational costs to a capital budget

Lack of Information and Guidance: Because the issue of sustainable ICT is relatively new, many people, particularly teaching and research staff, do not know where they can find relevant information and guidance. Especially confusing is the fact that a number of vendors claim that their products are “green”. A common problem is that much of the ICT equipment used in the institution are not owned by the IT department, so it is hard to carry out an audit of what is owned by whom, and how energy-efficient it is. The situation is exacerbated by the lack of standardized metrics to assess the energy efficiency of ICT equipment.

A good understanding of the energy consumption association with specific computer tasks is a prerequisite for better management, but without this kind of information it is difficult to set targets for, and therefore to measure the success of sustainable ICT projects.

Infrastructure-related Challenges: Before any ICT-based programme is launched, policymakers and planners must carefully consider the following:-

- a. Are appropriate rooms or buildings should be available to house the technology? Proper buildings extensive retrofitting to ensure proper electrical wiring, heating/ cooling and ventilation, and safety and security are highly needed.
- b. Another basic requirement is the availability of electricity and telephony. In developing countries large areas are still without a reliable supply of electricity and the nearest telephones are miles away.

Prospects of ICT for Sustainable Development

Web site design: Young school leavers can be fully engaged in web design thereby bringing market information closer to the rural dwellers through the use of local language that is understood by the people.

Programming: Many Small and Medium Enterprise (SMEs) today employ the use of database in their daily business transaction. Young programmers can adequately earn a living by coding the programs that will run these SMEs.

Maintenance: One of the major requirements in the ICT world is the technical skill to service the computer and other ICT facilities. Youths can develop themselves in this area and then become self-reliant as they can even serve as consultants to the governmental and non-governmental organizations.

Commercial Computer Outfits: There is great demand for printed document in today’s society. Youths can empower themselves with the necessary computer skills that can make them self-employed in meeting this demand.

Computer Training Centres: Young people are increasingly being engaged in the training of other youths (i.e. train the trainers) in acquiring computer literacy thereby getting their source of livelihood from running the training centres.

Computer Networking: This plays an important role for easy and effective dissemination of information in industries, organization, institutions and almost all governmental parastatal. Young generation can be empowered with IT skills on how to do computer networking.

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Cyber Café: Young men are being employed to manage various cybercafé throughout the world there by giving them job opportunities for self-reliance.

Economic Sustainability: ICT plays an important role in sustaining the economy of a country. Through internet GSM, radio, television etc. Different transactions take place all over the world in 24 hours. With the use of credit card you can make transaction anywhere in the world without waste of energy and time. Banks also use ATM card for withdrawal of money in 24 hours. Therefore, the process of e-banking and e-commerce is very important in promoting the economic development of a country in the context globalization.

Social Sustainability: ICTs equipment gives people access to listening and reading news as well as entertainment. It is possible to chat with a friend through internet both audio and visual. This is also applicable to GSM use also allows teleconferencing (more than two people communicating at the same time).

Political Sustainability: This is the greatest weapon that politicians use in doing their campaign. Television, radio and internet play very important roles here. With this equipment they reach everybody in the whole world during campaign. Sophisticated software is used in casting and counting votes which minimize injustice during election. In fact, in the 2008 US election, Obama relied heavily for his success in the polls on the internet through which millions of dollars were collected as donations for his campaign.

Enhancing Teacher Training: ICTs have also been used to improve access to and the quality of teacher training. For example, institutions like the Cyber Teacher Training (CTTC) in south Korea are taking advantage of the internet to provide better teacher professional development opportunities to in-service teachers. The government funded CTTC, established in 1997, offers self-directed, self-paced web-based courses for primary and secondary school teachers. Courses include “computers in the information society,” “Education Reform,” and “future society and Online tutorials are also offered, with some courses requiring occasional face-to-face meetings.(European Journal of Computer Science and Information Technology, 2014). In china, large-scale radio and television-based teacher education has for many years been conducted by the China Central Radio and TV University. (Carnoy, B. & Martin M,(2001).

At Indira Gandhi National Open University, satellite-based one-way video-and two-way audio-conferencing was held in 1996, supplemented by print materials and recorded video, to train 910 primary school teachers and facilitators from 20 district training institutes in Karnataka State. The teachers interacted with remote lecturers by telephone and fax. (Carnoy, et al., 2001).

Active learning: ICT enhanced leaning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information learners therefore learn as they do and, whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to the learner’s life situation. In this way, and in contrast to memorization-based or rote learning, ICT-enhanced learning promotes increased learner engagement. ICT-enhanced learning is also “just-in-time” learning in which learners can choose what to learn and when they need to learn it.

Collaborative Learning: ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modelling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners’ teaming and communicative skills as well as their global awareness.

It models learning done throughout the learner's lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields.

Evaluative Learning: ICT-enhanced learning is student-directed and diagnostic. Unlike static, text-or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember. Direct class teaching, where broadcast programming substitutes for teachers on a temporary basis; school broadcasting, where broadcast programming provides complementary teaching and learning resources not otherwise available, and general educational programming over community, national and international stations which provide general and informal educational opportunities.

The Way Forward

Nigerians can continue to list the plethora of problems plaguing education in Nigeria but the country can also proffer solutions to it. Educational system in Nigeria is decades behind compared to the rest of the world, how the country can then catch up, how she can take a giant leap given these peculiar challenges are not so farfetched, solution is adequately incorporating ICT in the education system.

Education delivered through ICT can bring the best quality of education at a low cost deployed across all spheres to the doorstep of students nationwide at the same time delivered in the simplest and most understandable way to individual student; this will inspire and task student's independent thinking. The possibilities of such solution are endless because when students are inspired, they can imagine solutions from what they learn and apply it in their daily life and environment. Challenges such as poor quality of teachers, lecturers and administrators, poor delivery of educational content, non-conducive learning environments, increasing cost of education etc., can all be addressed by ICT, platforms can be created to suit students need in very many ways as needed.

ICT education is an important lever for accelerating development in all sectors of the economy and it is the human element rather than the machine in ICT that holds the key to development. Emphasis therefore needs to be laid on how the country can prepare human resources to better deliver the ICT enterprise, ICT gadgets in the hands of the ignorant are like gold before swine.

Though there are a noticeable improvement at all levels of the education system in the use of ICT in schools, it is worth realising that the road ahead is far especially for the public school system. This is the age knowledge of explosion, globalisation and technology and with ICT. Nigeria can leap forth the higher level of social, economic and political development.

The Nigerian government has made the development of ICT one of its strategic priorities in order to implement the new world order, growth and transformation agenda. The ICT policy, the incentives and the rise of government expenditure in ICT infrastructure and service are the reflection of the government's commitment to use ICT as a tool for rapid economic growth.

In concrete terms, ICT can enhance teaching and learning through its dynamic, interactive, and engaging content; and it can provide real opportunities for individualised instruction. Information and communication technology has the potential to accelerate, enrich, and deepen skills; motivate and engage students in learning; help to relate school experiences to work practices; help to create economic viability for tomorrow's workers; contribute to radical changes in school; strengthen teaching, and provide opportunities for connection between the school and the world (Davis and Tearle, (1999); Lemke and Coughinglin, (1998). Information and communication technology can make the schools more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' professional activities (Kirschner and Woperies, 2003).

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In research, ICT Provides opportunities for schools to communicate with one another through email, mailing lists, chat rooms, and so on. It also provides quicker and easier access to more extensive and current information, and it can be used to do complex mathematical and statistical calculations. Furthermore, it provides researchers with a steady avenue for the dissemination of research reports and findings (Yusuf and Onasanya, 2004).

Honey and Mandinach (2003) advanced three major reasons for ICT in education. They suggested that technology is usually

1. A tool for addressing challenges in teaching and learning
2. A change agent, and
3. A central force in economic competitiveness.

As a tool for addressing challenges in teaching and learning, technology has capabilities for delivery, management and support of effective teaching and learning. It is equally good for geographically dispersed audiences, and it also helps students to collect and make sense of complex data. It also supports diverse and process-oriented forms of writing and communication. As a central force in economic competitiveness, it deals with economic and social shifts that have technology skills critical to future employment of today's student. Looking at the role of education in the development of any society, the school will be indispensable in developing an ICT culture of any country. The school must provide effective leadership in ICT integration, through research, modelling of effective integration of ICT, and provision of opportunities for professional development of citizens of a country.

Conclusion

From the foregoing, it is clearly shown that ICT plays an important role in sustainable development for both developed and developing countries. In conclusion, government and other stake holders must take necessary measures on proper implementation of ICT facilities in order to achieve goals and objectives of sustainable development.

Recommendations

Consequently, recommendations were made for minimizing some of the challenges attributed to the implementation of ICT facilities.

A rigorous analysis of the present state of education system: ICT-based interventions must take into account current institutional practices and arrangements. Specifically, drivers and barriers to ICT use need to be identified, including those related to curriculum and pedagogy, infrastructure, capacity-building, language and content, and financing.

The specification of educational goals at different education and training levels as well as the policymaker: an understanding of the potentials of different ICTs when applied in different contexts for different purposes, and an awareness of priority education needs and financial and human resource capacity and constraints within the country or locality, as well as best practices around the world and how these practices can be adapted for specific country requirements.

Government should provide adequate fund for ICT facilities maintenance and otherwise. The Federal Ministry of Education should work with the Federal Ministry of Science and Technology to develop a special training scheme for technical personnel for implementing the ICT in Education policy.

The institute for Science Laboratory Technology is well positioned to implement the scheme. To sustain the scheme, special incentives should be provided to such technicians or technologists if they are not to be lured to greener pasture in the private sector

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