Shifting Paradigms in Education: Imperatives for the Infusion of ICT into the Educational System of Bayelsa State of Nigeria

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ABSTRACT

Over the past three decades and most recently, information and communications technologies (ICTs) have orchestrated obvious fundamental changes in the way mankind organises himself and does his own things, rendering the world into one digital global village. The greatest casualty in the mist of all these changes is the educational system, because the development, acquisition and dissemination of information is central to the educational system. This paper examines the shifting paradigms in the global education arena which is a direct consequence of advances in ICT and makes a strong case for the infusion of ICT into the educational system of Bayelsa State of Nigeria, in order that the state will maximally derive the benefits inherent in the use of ICT.

Key words: ICT, infusion, imperatives, educational system, Bayelsa State, Nigeria

Introduction

The Governor, His Excellency, Chief Timipre Sylva expressed his Strategic Intention to develop Bayelsa State by building a prosperous State that guarantees all the basic

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needs for a sustainable livelihood of all her citizens, including but not limited to: access to free qualitative education, equal opportunities for growth, and individual self-actualization (The Government of Bayelsa State, 2008). These are all capstones in the Millennium Development Goals (MDGs) as well as in President Yar’ Adua’s 7-Point agenda.

Truth is, education is central to the creation of the intellectual capacity on which knowledge is nurtured to promote lifelong learning practices that are necessary to update individual knowledge and skills; it enriches people’s understanding of themselves and the world, improves the quality of their lives and leads to broad social benefits for individuals and society and no country can achieve sustainable economic development without substantial investment in human capital (Yamin and Tanas, 2006). Incidentally, education has come to serve the administrative and economic interest of the nation-states and had become an essential aspect of the development of national identity (Shetty, 2007).

The fact that Nigeria is dramatically evolving towards an emerging economy and hoping to be one of the World’s twenty biggest economies by 2020 is perhaps, neither an undue optimism nor an over-ambitious projection if viewed upon the backdrop of Nigeria being Africa’s most populous country as well as the continent’s largest exporter of oil and gas, amongst other favourable indicators (Bubou, 2008a).

The world is in the midst of a historical transformation at the turn of the millennium and like all major transformations in history, it is multidimensional: technological, economic, social, cultural, political, and geopolitical (Castells, 1999). But technological advancements have brought new unplanned complexities, and the globalization of information through electronic means rendered these imbalances more obvious (De Magalhães et al., 2007). However, in the context of radical political and economic transformation, these contradictory functions need to be managed within a global movement towards a knowledge-driven model of economic liberalism (Yamin and Tanas, 2006).
The United Nations (UN) made the following declaration on information –

“We (----) declare our common desire and commitment to build a people-centred, inclusive and development-oriented information society, where everyone can create, access and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting sustainable development and improving their quality of life.”

This position was further emphasised by the New Partnership for Africa’s Development (NEPAD) when it stated that “Better connectivity offers the prospect for African countries to transform their economies from reliance on traditional activities, with low productivity and weak growth outlook, to more advanced activities that can sustain higher wages, create new employment and reap the other social benefits offered by new technologies” (APF/Tokyo, 2008 as cited in NEPAD, 2007). Similarly, the building up of the ICT revolution poses the challenge of providing developing and emerging countries with an adequate way to be linked with the rest of the world to avoid the risk of being cut out from mainstream of information flow (Ndukwe, 2007).

The country’s National Policy on Education emphasises the creation of an informed egalitarian society that is equipped with the power of knowledge so as to be creative in thinking, be curious to gain new knowledge, and again, be able to develop a critical outlook (Federal Ministry of Education, 2004).

In line with the UN’s and NEPAD’s goal on Information and Telecommunications Technology (ICT), perhaps for the first time in the history of our nation, we have made one giant move as the Giant we are, by strategically tackling the telecommunications sector of our economy. Data from the International Telecommunications Union (ITU) as supplied by Miniwatts Marketing Group (2008) indicated that Nigeria has taken the lead in the information communications sector in the continent from a lowly position in the past. For the first time, there are many more telephone and internet users in Nigeria than any other African country. We are indeed, on our path to arriving at our destiny.
Some observers according to Stiroh (2002), have raised the possibility that production spillovers and network effects associated with ICT are important part of the ‘New Economy’ as ICT is seen to have contributed to economic growth. ICTs allow countries to leapfrog stages of economic growth by being able to modernize their production systems and increase their competitiveness faster than in the past. The most critical example is offered by the Asian Pacific economies, and particularly the cases of Hong Kong, Taiwan, Singapore, Malaysia and South Korea.

Undoubtedly, Nigeria’s economy has benefited immensely from the ICT sector since its deregulation. Despite the huge economic benefits that have accrued to our country in terms of Direct Foreign Investments, job creation of over 1 million (direct and indirect jobs), ICT has also fundamentally altered the way we do things. This is greatly felt in the banking sector, aviation and commerce and to a lesser degree in agriculture, governance, health, education and etc.

According Muller (2000) communication is an important ingredient in the search for new problems, creation of better problem representations, and the invention of improved problem solutions. While ICT is having a revolutionary impact on educational methodology globally, this revolution is not widespread and needs to be strengthened to reach a large percentage of the population (Mac-Ikemejima, 2005) as also confirmed by Castells (1999) that the widening global digital divide when he stated almost with certainty that the diffusion of ICT is extremely uneven, with most of Africa being left in a technological apartheid, and many other regions of the world. The disparity exists even within countries and Bayelsa State is clearly a digital have-not state.

Perhaps in realisation of the contributions ICT can make to the development of society, the Government of His Excellency, Chief Timipre Sylva has placed high priority on capacity development on ICT skills. Consequently, the state government has embarked on the training of all Bayelsa State civil servants on ICT skills as well as sponsoring youths to foreign lands to acquire the much needed ICT skills.
This is a clear demonstration that there is will on the part of government to make the state an information conscious one, but the most import place to start the campaign from, is the education sector as it is from there that the rest of the larger society will learn from.

What then is ICT? ICTs include all the associated technologies that enhance the development and sharing of knowledge and information from person to person and from system to system. It also includes technologies that aid the interaction of persons with other technologies and vice-versa

**Paradigm shifts in education**

While our educational system is still very much like it used to be or even worse than two decades ago, there are clearly marked shifts in the educational arena globally.

Recent trends in global education systems now lay emphasis on science and technology education, entrepreneurial education (to create entrepreneurial societies), continuous lifelong learning and an ICT-enabled educational system. And of in all these, ICT is the driver.

These shifting paradigms range from contents, to facilities (human resources inclusive), to pedagogical, didactic as well as androgerogical perspectives. In the mist of all these shifts and drastic changes experienced in the educational system, the culprit fingered to have been responsible is Information and Communications Technology. Obviously, virtually everything on earth is bending towards becoming ICT compliant and the educational system seems to be one of the greatest casualties.

Below are some macro and micro level shifts in paradigms in the educational sector that is orchestrated by ICT: -

- For instance, the previously episodic pattern of schooling is given way to continuous lifelong learning;
The blackboard is gradually given way to smart boards and projector screens and the chalk to the marking pen;

Handwritten assignments are giving way to computer typed assignments;

Classrooms are moving away from conventional classrooms to telecommunicated classrooms;

Physical classrooms to virtual classrooms and from physical libraries to virtual libraries and repositories;

There is also the swing towards an increased emphasis on distance learning as a world-wide phenomenon (Cronje, 1997 as cited in Spikes, 1990; Thatch, 1995; Hwang, 1997);

Rapid advances in the field of information processing have meant that conventional (postage-driven) distance education is fast being replaced by ICT (Cronje, 1997). In fact, it is envisaged that, in time to come, university will be mere certificate conferring institutions as people will prefer to study in the comfort of their own homes; and

The shift is also observed in the move away from individualistic learning styles to problem-based cooperative learning.

ICT and education
Since the 1990s the entire planet has been organized around telecommunicated networks of computers at the heart of information systems and communication processes and that up until today and perhaps for a long time to come, the entire realm of human activity will continue to depend on the power of information (Castells, 1999). Most of the planet’s 6.1 billion inhabitants are within reach of telephone service... for the first time in history there are now more telephone subscribers worldwide than there are households (NCC, 2003 as cited in ITU, 2003).
Nicholson *et al* (2005) in their paper when weighing the interactions of societal stakeholders sought to bring technology back into focus, not because they wished to take a techno-centric perspective, but rather because they wanted to consider the social aspects of technological practices that are relevant to the educational domain. For about a decade ICT is seen to have had an enormous influence on research and society, a very strong reorientation of people's conceptions of learning, the learner, and the role of the school (Slangen and Sloep, 2005).

Arguably, new communications technologies will enable the complete redesign of educational practice and may likewise thoroughly alter the constraints conditioning the creation and use of knowledge. Digital technologies are enabling a new wave of educational innovations, not by bringing historically novel pedagogical principles in their train, but by changing the ecology of feasibility with respect to known principles (ILT, 1999).

Consequently, according to (University of Pretoria, 2002) the rationale for the infusion of technology into institutions of learning rests on two pillars, the first being the need for learners to be technologically literate and the second is the hope that technology could expedite the learning process. In considering the fist premise, learners learn about technology, and in the second, they learn with technology.

Devon and Liu (2002) remarked that as the world is fundamentally changing, educators have to be responsive to those changes and some of the changes will see a more and continuously integrated world driven by ICT and by an economic culture that would leave no resource unutilized.

These changes and discoveries have obvious synergies and relationships that begin to jump-start the knowledge/information age (Hodgins, 2004). Entering the 21st century, Americans embark on an era of historic change in which they are using new information technologies to renovate education and society for the betterment of humankind (ILT, 1999).
While IT is not the cause of the changes we are living through in this information age, without new ICTs none of what is changing our lives would be possible (Castells, 1999) but that the most powerful promise IT offers is its ability to capture knowledge so that it can be analyzed, reused, shared with others, and used to create a spiral of more new knowledge (Hodgins, 2004).

The Japanese have already been responding to changes in the workplace and society as far back as the 1980’s, when Japan’s Ministry of Education initiated several major changes, one of which was the inclusion of a new computer literacy course in technology education programmes in lower secondary schools whose primary objective was to help students understand the roles and functions of computers, and develop capability for the use of computers and information and was made possible by ensuring that every one of the 47 prefectures (regional self governing bodies) in Japan has an education centre that includes a department of technology/industry-related education including ICT (Murata and Stem, 1993).

Similarly, the Americans have increasingly expressed strong views that advanced telecommunications should facilitate learning in all subjects, quite possibly at all grades and levels of sophistication (McClintock, 1997). Israel too, has a national education network that lets students gather knowledge and use e-mail either at school or from home, Costa Rica is also providing every public high school student with access to the internet and e-mail (Gates, 1999). The success story is not limited to the Japanese and the Americans, nor the developed world as emerging economies like India, China, Brazil, the “Asian Tigers” – Malaysia, Indonesia, Singapore, Korea, and our next door neighbours, the South Africans have all keyed-in to the ICT-enabled education train and have subsequently counted their blessings (Bubou, 2008b).

There is considerable hope and some positive evidence that technology can expand and improve education at all levels, with special references to the design and content of instructional materials, delivery, assessment and feedback (Shetty, 2007). ICT carries on high promise both in human and economic terms and benefit among
others, education at all levels, on-the-job training, food, health care and environmental management (Radicella, 2003).

**The imperatives**

In the current new world order that has largely become driven by knowledge and exchange of information and ideas, surviving in today’s information age depends on the ability to use local and international information technology systems and networks (Bubou, 2008b). Therefore, acquiring Information and Communications Technology (ICT) skills has become an imperative as a lifelong sustainable survival strategy.

The ICT and most especially, the Internet should be used as a precise and effective tool in any process that facilitates development – not merely as an end in itself (Mbambo and Cronje, 2002) but as an ancillary to achieve other lofty ends.

Improving learning and thinking in school has been an objective of the educational community for a long time (Slangen *et al*, 2008). Arguably, new communications technologies will enable the complete redesign of educational practice and may likewise thoroughly alter the constraints conditioning the creation and use of knowledge and ultimately prove to be helpful in reaching this objective mentioned above (ILT, 1999; Slangen *et al*, 2008).

A study by Cossa and Cronje (2004) identified some important collateral aspects that developing countries should not underestimate when planning the dissemination of ICT in schools to accelerate the country’s future participation as an active member of the global information society. Though, ICT is still relatively new to us, we need to start developing our skills of exploiting the medium to our best advantage (Cronje, 1997).

In short, we need a model of the education process that takes account both of the facility of young people with media and informational technologies, and also the epistemological and meta-cognitive development that needs to take place in order for this facility to be exploited for educational purposes (Nicholson *et al*, 2005). There are
far reaching implications when schools attempt to integrate technology into education as a major cultural clash ensues as ICTs are the embodiment of rapid change, running through entire cycles of innovation in what seems the blink of an eye (Wang, 2008).

According to Slangen and Sloep (2005) research strongly supports the view that intelligence is not static, rather, it can be developed and trained (as cited in Costa and Kallick, 2002) and that it depends to some reasonable extent on the learning environment. Integration of ICT into the state’s educational systems will be part of the right steps in the right direction towards creating such stimulating learning environment for learners in Bayelsa State at all levels of our educational system.

For the higher education sub-sector, according Adeya and Oyelaran-Oyeyinka (2002), there are three different ways in which ICT might fundamentally affect teaching and research in universities and colleges, and these are:

✓ provide greater student access to education;
✓ improve curriculum and quality of instruction; and
✓ increase productivity of academic publications.

New communications technologies create challenging opportunities. But opportunity is not tantamount to actuality. Educators must grasp the opportunities. Their educational innovations will determine the cultural and social characteristics of the resulting arrangements (ILT, 1999).

The National Policy on Education stresses the need for education to be accessible to all; the same position is highlighted by His Excellency, Chief Timipre Sylva in his strategic vision for a sustainable Bayelsa State. Adoption of ICT into the educational system may provide leeway towards achieving that objective as ICT-enabled education is flexible and adaptive. Flexible in terms of time, place, content, sequence and delivery media and adaptive in terms of matching the characteristics of all the persons using it, not only for learners, but also for staff members (Koper and Manderveld, 2004).
How to integrate ICT into Bayelsa State’s Educational Sector?

As the State Government has already embarked on the training of all civil servants in the state, the training and retraining of all staff (both academic and non-academic) on ICT skills needed to function in the sector be started almost immediately. For instance, in recognition of the issues brought upon by the integration of ICT into the school system, in the Orange Free State Education Department (OFSED) of South Africa, deserving schools and deserving teachers were identified and trained to facilitate cooperative learning (Thomas and Cronje, 2007). The implication for this is that, the first step towards ICT integration into the educational system should start with the training of those who will be responsible with the use and further training of others with ICT skills. See [Figure 1] for the strategic steps in the integration process.

Figure 1: Steps in the infusion of ICT into the educational system. Adapted from Gates, 1999.

Another very import step is the strategic acquisition and deployment of ICT infrastructure across the state. This can be championed by the Due Process and e-Governance bureau. Alternatively, a Ministry of Science and Technology may handle this aspect.

In this regard, government can collaborate with the private and other Federal Government establishments as the financial implications for this are quite daunting. All that the state government needs to do is to partner with indigenous ICT firms operating
within the state, and use their platforms to greater advantage. The State Government can also invest into some of these Private Telecoms Operators (PTOs) with the intent to making ICT accessible to all the nooks and crannies of the state as envisioned by the Federal Government as well.

**What are the likely challenges?**

The greatest challenge to an ICT-enabled educational system may be the challenge of infrastructure because of the capital intensive nature of the technology. However, that challenge can be overcome by the steps highlighted earlier.

> Our public educational facilities are facing major challenges and gross under-funding. Another important area of improvement needed urgently is in the planning of our educational manpower development needs (Ndukwe, 2007). How to overcome this too has been addressed above.

> However, a study carried out in Mozambique by Cossa and Cronje (2004) showed that, in spite of the extreme socio-political background and relatively low levels of training, an integration of ICT into education project was been reasonably successful. This implies that, giving the available resources at our disposal, infusion ICT into the state’s educational system is an obvious possibility.

**Conclusions and recommendations**

The importance and need for an ICT-enabled educational system in the state as well as challenges and strategies have also been addressed in this paper.

> There has been less emphasis on training of educators, the development of appropriate content and even less on the maintenance of the educational technology infrastructure in the country (Adeya and Oyelaran-Oyeyinka, 2002). Thus, recognising that the underlying problem is the lack of sufficient well-qualified human resources to able to be to handle new systems and technologies, the academic community is the obvious starting point for these efforts as it can be expected that from this community
know how will permeate to the rest of society, it is necessary to develop and adapt new systems and technologies to make a suitable use of ICT (Radicella, 2003) in our educational system.

It is therefore; recommended that the entire educational system of Bayelsa State be ICT-enabled.

That emphasis should be laid on science and technology education, because it is science and technology education that will determine the development of tomorrow’s economies.

That our education encourages continuous lifelong learning as outlined in the National Policy on Education.

That the development of entrepreneurial skills be introduced to the school system right at the primary school level in order to create an entrepreneurial society.

While it may be beyond the powers of this forum to create a Ministry of Science and Technology in Bayelsa State, it is recommended that a proposition by made to the state government on the desirability of having it, so that the ministry can play a major complementary role.

It is the writers most profoundly held opinion that, an education system that does not integrate ICT into it nowadays certainly is an unsustainable one, as before long, it will become obsolete and losses touch with modern global trends.

References


Technologies in Engineering Education (eTEE) Conference 11-16 August, 2002
11, pp. 72 – 82.

Leadership January 2000 through December 2004, Institute for Learning
Technologies, Teachers College, Columbia University.

Reusable, Interoperable, Rich and Personalised Units of Learning. British Journal

Presentation at the 8th United Nations (UN) ICT Task Force Meeting, April 13-15,
2005, Dublin, Ireland.

Mbambo, B. and Cronje, J.C. (2002). The Internet as information conduit for small
business development in Botswana. Aslib Proceedings, Vol. 54, No. 4, pp. 251 –
259.

Reports. Miniwatts Marketing Group’s World Internet Stats Web Site:

Digital Networks for Agricultural Research and Development. Department of
Agricultural Economics, CAU Kiel, Germany.


