APPLYING TECHNOLOGY TO EDUCATIONAL DELIVERY AND ITS MANAGEMENT: LESSON FROM NIGERIA

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Abstract

The challenges of nation building and sustainable development have continued to feature prominently in the general reckoning of problems of underdevelopment in the developing countries of the world. Since the attainment of political independence from the British colonial administration in 1960, one of the critical thrusts of central governance in Nigeria has been the particular policy attention on the educational sector – having been perceived as a logical bridge between the two contrasting worlds of underdevelopment and development. The increasing worldwide trends in the various applied uses of educational technology, e.g., for purposes of computer-aided student assessment, electronic performance and productivity support systems, the pursuit of multiple other educational management functions, etc., are acknowledged in this paper. Against that backdrop, therefore, the specific role and utility of technology within the context of educational management in Nigeria is also critically discussed – revealing the perceived odds and ends as well as existing challenges of educational management in Nigeria. Nevertheless, this paper particularly extols the virtue of technological applications to the enterprise of educational management, especially in a developing country context. More specifically, lessons that can be learned from the circumstances and practices in the Nigerian educational system are also listed and discussed for the wider benefits of cross-national educational delivery and the management of associated operating systems across the globe.

Keywords: technology, educational management, educational plans and policies, applications challenges, strategic human capacity building, quality assurance.

General background of educational development in Nigeria

The educational sector of Nigeria has traditionally been considered very strategic and critical for purposes of development planning and the achievement of sustainable development in the long run. In the successive years following the attainment of political independence from British colonial rule in October 1960, education has remained one of the earliest social services to be introduced to Nigeria. The fundamental importance attributed to education has been premised on the aggregate utilities or social benefits that are derivable from its appropriate development both in policy and practice. Perhaps the most appealing of these benefits include: public awareness that education is key to the

continuous development of the required human capital for meeting the skill demands of labor markets and operational needs of work-organizational systems; realization of the logical connectivity between educational attainment or competency levels and the achievement of labor productivity; and, appreciation of the often direct links between education and organizational learning, on the one hand, and the potential for wage/salary increases, on the other hand.

Precisely, therefore, it is for the foregoing reasons that the post-independence governance elites in Nigeria had also particularly paid deserving attention to the early planning and development needs of the education sector. This had been manifested in the initial policy thrusts of the successive Governments from 1960 to date. Some of these policies and enabling legislation had established the basic framework for the commencement or conduct of educational programs, activities and practices in general. For illustration purposes, the following specific notes are made:

a) Despite education being one of the earliest social services to be introduced to Nigeria as a part of Government (or public) policy, the majority of the early primary and secondary educational institutions were founded and operated by various religious missions, while only a few were directly-owned by Government;

b) Right from the onset, the policy framework of educational development in the new Nigerian nation-state had placed education on the "concurrent list" of public administration (that is, subject to practical administration and funding at the federal or central, state and local Government levels);

c) In the interest of the necessary attainment of quality of practices and operations within the educational sector, the central Government had further established at various periods such regulatory institutions as: the National Board for Technical Education (NBTE); the National Teachers' Institute (NTI); the National Universities Commission (NUC); and, the Joint Admissions and Matriculation Board (JAMB), among others (see NBS, 2015).

Education in Nigeria is the shared responsibility of the federal, state and local governments. The Federal Ministry of Education plays a dominant role in regulating the education sector, engaging in policy formation and ensuring quality control. However, the federal government is more directly involved with tertiary education than it is with school education, which is largely the responsibility of state (secondary) and local (primary) governments. The education sector is divided into three sub-sectors: basic (nine

years), post-basic/senior secondary (three years), and tertiary (four to seven years, depending on the major or course of study). Education in Nigeria is provided by both the public and private institutions. Furthermore, the guiding principle of educational development in Nigeria has been to equip every citizen of the country with such knowledge, skills, attitudes and values that will enable him/her to derive maximum benefits from membership of the Nigerian society, lead a fulfilling life and contribute to the development and welfare of the community. Correspondingly, the ideal or best practice in this enterprise is to align conduct with the recommendation of the United Nations Educational Scientific and Cultural Organization (UNESCO) that 26 per cent of a country's annual budgetary allocation should be allocated to education, based on its perceived social importance (UNESCO-IBE, 2010).

However, against that backdrop, it is noteworthy that the educational sector of Nigeria has never been so favored, considering that the fulfillment of the UNESCO recommendation has been rather far-fetched. The country has never met this recommendation and, to date, the highest allocation to the education sector has not exceeded 10.70 per cent, as exhibited for the year 2015 in the accompanying statistical table below.

TABLE 1

PROFILE OF NATIONAL BUDGET RELATIVE TO EDUCATION BUDGET

YEAR	TOAL NATIONAL BUDGET (N)	EDUCATION BUDGET (N)	% OF ALLOCATION
2011	4,226,191,559,259	393,810,171,755	9.32
2012	4,749,100,821,170	468,385,490,528	9.86
2013	4,987,220,425,601	509,039,713,761	10.21
2014	4,642,960,000,000	493,458,130,268	10.63
2015	4,358,000,000,000	492,034,000,000	10.70

Source: Nigeria Budget Office (www.budgetoffice.gov.ng)

The statistical data contained in Table 1 above reveal that the total budget, since 2011 till date, is N22, 963,472,806,030.00 - with education attracting N2, 356,727,506,312.00, only. This is 10.26% of the total budget. The lowest allocation was in 2011 (9.32%), while the highest was in 2015 (10.70%). The general trend, however, has been far from encouraging, considering the deplorable state of the Nigerian educational system. There is the need to, at least, triple the current allocation to shake off the ignoble state of the system by

applying tangible funds largely to significantly improve facilities for teaching and learning, teacher quality and welfare as well as curriculum delivery.

However, in spite of the enormous formative efforts and strides made by the successive Governments in Nigeria to build institutions for the head-long development of the educational sector, various gaps and deficits have been cautiously perceived and associated with this sector. And, unless definite corrective action is taken – including a more proactive leveraging on modern information technology - to robustly mitigate the existing shortcomings and challenges of this sector, the intended purposes and potential benefits of the sector for Nigeria cannot be fully optimized in the overall interest of public good and sustainable national development futures as an emerging economy on the African continent.

Specific areas of technology application to educational management

The demand for computer/ICT literacy has progressively increased in Nigeria over the recent decades, especially, because of the general understanding and perception by employees that organizational and individual operational efficiencies can be enhanced through the leverage on computers and related ICT facilities. But, paradoxically, employees have also tended to perceive computers as being inherently threatening to employment security, and as such it is also quite possible to experience job security through the acquisition of tool technological education and appreciable computer literacy. This tendency has further accentuated the clamor variously for computer literacy, and the demand for professional services in favor of the teaching and learning of modern information technology application skills.

Also, new instructional techniques that use ICTs have been found to provide a different modality of instruments that are applicable in the Nigerian educational system. For example, to the student, the ability to use ICT tends to facilitate the increased individualization of learning. Correspondingly, in schools that leverage on innovative technologies, students are enabled to gain easy access to tools that provide valuable and immediate feedback for literacy enhancement – a development which is currently found to lack full implementation in the Nigerian school system (Enuku and Enuku, 1999 & 2000). Therefore, it is expected that modern information and communication technology applications will generally facilitate the achievement of qualitative improvements in the Nigerian educational system, thereby also enhancing quality assurance in educational delivery and achieving better overall education for students. It is further projected that a technology-savvy workforce will also engender ICT growth in Nigeria, including likely improvements in military technology and communications as well as the development of skilled ICT professionals who are sufficiently-equipped to successfully manage technological problems both in Nigeria and internationally (Goshit, 2006).

Existing lacuna and systemic challenges

There are developments in the Nigerian education sector which indicate some levels of ICT application in the secondary schools. The Federal Government of Nigeria, in the *National Policy on Education* (Federal Republic of Nigeria, 2004), recognizes the prominent role of ICTs in the modern world, and has integrated ICTs into education in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school. At the junior secondary school, computer education has been made a pre-vocational elective, and is a vocational elective at the senior secondary school. It is also the intention of government to provide necessary infrastructure and training for the integration of ICTs in the secondary school system. It should be noted that 2004 was not the first attempt the Nigerian government made to introduce computer education in schools. In 1988, the Nigerian government enacted a policy on computer education. The plan was to establish pilot schools and diffuse computer education innovation first to all secondary schools, and then to primary schools. Unfortunately, the project did not actualize beyond the sheer distribution and installation of personal computers (Okebukola, 1997; cited by Aduwa-Ogiegbaen and Iyamu, 2005). Okebukola (1997), therefore, concludes that the computer is not part of classroom technology in more than 90 percent of the public schools in Nigeria. The implication is that the chalkboard and textbook continue to dominate classroom scenarios in the generality of secondary schools in Nigeria.

The Federal Ministry of Education had, much earlier, launched an ICT-driven project known as School Net (www.snng.org) (Federal Republic of Nigeria, 2006; Adomi 2005; Okebukola, 2004), which was intended to equip all schools in Nigeria with computers and communications technologies. In June 2003, at the African Summit of the World Economic Forum held in Durban, South Africa, the New Partnership for African Development (NEPAD) launched the e-Schools Initiative, intended to equip all African high schools with ICT equipment, including computers, radio and television sets, phones and fax machines, communication equipment, scanners, digital cameras, and copiers, among other things. It is also meant to connect African students to the Internet. The NEPAD capacity-building initiative will be executed over a ten-year period, with the high school component being completed in the first five years. Three phases are envisaged, with fifteen to twenty countries in each phase. The phases are being staggered, and an estimated 600,100 schools are expected to benefit. The overriding objective of this initiative is to impart ICT skills to young Africans in the primary and secondary schools as well as harness ICT for the improvement, enrichment, and expansion of education in the African countries (Aginam, 2006). In the same vein, the Federal Government of Nigeria also originally supported or enabled a Mobile Internet Unit (MIU), operated by

the Nigerian National Information Technology Development Agency (NITDA). The MIU is a locally-made bus, converted into a mobile training and cyber centre. It warehouses ten workstations, all networked and linked to the Internet. The MIU is also equipped with printers, photocopiers, and a number of multimedia facilities as well as provides Internet through VSAT with a 1.2m dish mounted on the bus roof and further necessarily equipped with a small electric generator set for the supply of regular electric power. This entire mechanism is instrumental in the conveyance of the Internet to the various primary and high schools (Ajayi, 2003). However, the number of buses is so comparatively low, hence most rural areas and schools are yet to be similarly serviced. Significantly, this particular mention has again exhibited one of the existing serious operational constraints arising from the restricted scale, in ways that, literally and practically, only the tip of the iceberg is minimally scratched amidst such a large secondary school student population in Nigeria.

Although efforts have been made to ensure that ICTs are available and used in Nigerian secondary schools, the level of coverage is seemingly still quite low. For example, Goshit (2006) has observed that most schools, both private and government, do not offer ICT training programmes. And, by the assessment of NEPAD, the rating of the level of students' experience with ICTs on the African continent as well as their proficiency in using them is also very low. More specifically, 55% of students within the continent, including Nigeria, Algeria, Burkina Faso, Cameroon, Republic of Congo, Egypt, Gabon, Lesotho, Mali, Mauritius, Mozambique, Rwanda, Senegal, South Africa, and Uganda (who participated in the first phase of the NEPAD e-Schools initiative), expressed that they had practically no experience in the use of computers. Other findings included that the typical African school environment provides neither opportunity nor training in the use of ICTs, and that 75%of the surveyed teachers expressed possession of no or very little experience and expertise in the application of ICT for educational purposes. Further still, Okwudishu (2005) had found out that the non-availability of some ICT equipment in the schools often adversely affected the uses of ICTs by teachers. And, the lack of robust search skills and access points in the schools were cited as factors compounding factors and barriers to the free usage of the Internet by secondary school teachers (Kaku, 2005). Thus, the dearth or sometimes total lack of ICT equipment in the generality of Nigerian secondary schools has often compelled interested students to patronize commercial cybercafés for the required Internet access and interface – especially, giving the contemporary demands and circumstances of the 21st Century.

In another vein, the dearth of the required baseline support infrastructure, including energy supply systems, to power continuous institutional technology applications, is another major general constraining challenge to the widespread and effective uses of ICTs for the required technological support of educational delivery. The glossary of structural challenges, as empirically aggregated through field research, includes the

following albatrosses: limited, or poor, information infrastructure; poor ICT policy/project implementation strategy; poor information infrastructure; the continuing widespread ignorance and misconception about ICTs amongst Nigerians inadequate ICT-based human capital in the schools; the lack of, or inadequate ICT facilities in schools; non-availability of some ICT components in the schools; insufficient numbers of computers and peripheral devices; high cost of ICT facilities; the experience ICT connectivity problems; frequent electricity interruption; the existence of vast areas not covered by telecommunication services; outright under-funding; electricity failures; and, the related challenges of continuous workforce training; the lack of/poor perception of ICTs among teachers and administrators; the perception of information technology as a hurdle (NITDA, 2003; Adomi, 2005 & 2006; Aginam, 2006; Southwood, 2004; Ndiku, 2003, and cited by Wima and Lawler, 2007; Okwudishu, 2005; Enakrire and Onyenenia, 2007; Adomi, 2005; Adomi, Omodeko, and Otole, 2004; Adomi, Okiy, and Ruteyan, 2003; Goshit, 2006; Oduroye, undated; Brakel and Chisenga, 2003).

Some additional case illustrations are further provided, as follows, to buttress the foregoing mentions about the contemporary challenges of technological development and its usage in the enterprise of educational delivery and its management in Nigeria. The Federal Government of Nigeria's 1988 policy had introduced computer education to the high schools (Okebukola, 1997). However, evidence of implementation of this policy, if at all, was the distribution of computers to federal government high schools, but which were never used for computer education of the same students. Also, unfortunately, no effort appeared to have been made to distribute computer to state government-owned or privately-owned schools. Although the government had originally planned to integrate ICTs into the schools system and provide the required infrastructure, concerted efforts have not been made to provide appropriate facilities and trained personnel. Therefore, most schools are yet to offer ICT training programmes (Goshit, 2006) – implying that, for the NEPAD e-Schools Project which is expected to benefit an estimated 600,000 African schools, not all schools will be affected by this initiative. This is more so when, although most countries that have keyed into the NEPAD e-Schools Project have an ICT development policy or have made effort to create one, only a very few have clear implementation plans (Aginam, 2006). Evoh (2007) also observes that despite the recognized role of ICTs in improving education, ICTs remain a low financial priority in most educational systems in Africa. He further notes that most countries in the region lack resources for a sustainable integration of ICTs in education, and partly because African countries generally experience numerous competing development needs and gaps, including budgetary constraints, management challenges, shortage of teachers and other educational resources, and the perceived adverse impacts of the HIV/AIDS pandemic on education. Therefore, whereas all countries in the Africa region, for example, acknowledge the pivotal role of ICTs in development, only a few actually currently possess comprehensive policy and the required ancillary back-up of equally

comprehensive educational input resources. Better yet, where such policies exist, they tend to remain unclear and make little reference, if at all, to implementation strategies (James, 2001, cited by Evoh, 2007). And, of course, there is also the perceptual, attitudinal and behavioral dimension – which is no less significant. It is that, teaching as a profession in Nigeria is typically perceived to be meant for the impoverished people. Hence, the few education professionals that are available often prefer to work in business companies and industries where they can attract better compensation and reward for services rendered. With this deplorable condition, teachers are not motivated to go the extra mile in assisting the students to acquire computer education.

The Way Forward

- In Nigeria, and in the various other countries of the world, Governments should evolve ICT-related and focused public (or social) policies that are realistic and purposively targeted to the rapid acculturation of the functional knowledge and application of appropriate modern information technology for individual and organizational learning as well as for sustainable educational management within national and localized educational systems.

- In this regard, appropriate modern information technology facilities should be provided for the schools and allied institutions, while their usage should be periodically tracked and evaluated (i.e. audited), also for the purpose of assuring sustainability of the facilities and systems – in the best interest of public good.

- In the enduring developmental processes, computer and information and communication technology should also be popularized and promoted, especially in the secondary schools system(s), by making such tool education compulsory or mandatory for all students therein. For example, the *National Policy on Education,* 4th ed., in Nigeria has classified computer education as an elective course in the secondary schools system, whereas this should be made a compulsory aspect of contemporary secondary educational delivery.

- By the same token, educational management function should be deployed to aggressively awaken student interests and curiosities in the understanding and creative applications of the tools of modern information technology for the advancement of knowledge and self-development, in the general pursuit of their multitude of professional and occupational career interests.

- Thus, Governments and the managements of educational institutions in Nigeria and across the developing nations should purposively invest in the development of strategic human capital for purposes of effectively imparting and propagating tool knowledge and competencies in the application and management of modern information technology for the overall achievement of educational objectives and wider organizational development.

- To this extent, educational management should ensure that teachers that are deeply skilled in modern information and educational technology are reserved and deployed for the required services delivery, especially at the secondary schools level for the purpose of imparting such skills to the students as well as holistically engendering the knowledge and understanding of such technology.

Summary and Conclusion

The general backdrop of the educational system in Nigeria was situated at the beginning of this paper. For all intents and purposes, the entire foregoing mentions and analyses have confirmed the fact that the adoption and usage of modern information technology in the Nigerian schools have had remarkable and positive effects on the enterprises of teaching, learning and research. However, the widespread acculturation and mastery of educational technology is still farfetched for purposes of teaching, learning and research in the secondary school system of Nigeria. Thus, it has been also earlier noted in this paper that technology still comparatively plays a minor role in the teaching and learning processes of most Nigerian schools to date.

Several accounting factors have also been listed for this predicament and situational circumstances, especially in the Nigerian secondary educational landscape. These included: poor policy and project implementation strategies; policy asymmetries or incongruities; limited, out-rightly poor or non-existent information system support infrastructure; the lack of, or inadequate ICT facilities in schools; the lack of, or poor perception of ICTs among teachers and administrators; the high cost of ICT facilities; inadequate ICT-based human capital in the schools system; frequent electricity interruption; etc.

Nonetheless, quite a lot more developmental efforts – from policy to deed – are required and called for, both in Nigeria and the developing nations as a whole, to best and more aggressively harness the massive benefits that are particularly derivable from the various specific applications of modern information and educational technology. Recognizing, for example, that information and communication technologies (ICTs) are major drivers of worldwide, knowledge-based societies, the functional application of ICTs for educational delivery in Nigeria and the developing countries has the high potentials of ideally positively impacting on educational processes and learning, generally across these countries, both in the present and the future.

Some more urgent areas of technological application in the educational sector, especially in Nigeria and the developing countries, include: the management of schools and higher educational institutions; implementation and actualization of the general and specific functions of teaching, learning and research; and, necessarily facilitating the continuous creation, dissemination and application of knowledge for general development purposes, again, particularly in these developing countries of the world. etc.

The appropriate usage and deployment of the required educational technologies are considered, in this paper, as one of the critical levers of sustainable human development in the latter countries. Indeed, achieving sustainable human development should also be a major challenge and impetus to the leaderships and governance elites of these countries.

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