

Mobile Service Providers and M-learning in Nigeria: Mobility in a Contracting Space

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Abstract—This paper compares the M-Learning programmes of the two largest (in terms of network coverage) and pioneering mobile service providers (MTN and CELTEL/V-Mobile in Nigeria). It examines their services within the context of a generally deteriorating learning environment. It also compares the extent of their compliance with the transmission code of the Nigeria's regulatory agency, the Nigerian Communications Commission (NCC). Unstructured interview, content analysis, and observation are the major instruments used to collect all data for this study. All the data collected through these instruments are carefully analyzed vis-à-vis the Nigerian environment and the mobile service transmission regulatory provisions.

Index Terms—Celtel-Nigeria, M-learning-Nigeria, Mobile Service Providers-Nigeria, MTN-Nigeria.

I. INTRODUCTION

For Africa in general and Nigeria in particular mobile learning technologies are still relatively new feature in the learning environment. While they have long been a common feature elsewhere, in some cases taken for granted, mobile technologies are still unfolding their capabilities and possibilities, which remain substantially unexplored and untapped in large parts of Nigeria, especially the more traditional communities. In fact, the concept of m-learning remains largely unknown in Nigeria, despite what is generally considered to be significant liberalization of the telecommunications environment and unprecedented growth of the telecommunications industry in the last half decade.

Basically, two factors explain this situation. The first factor arises from the state of the Nigerian learning environment, and the second from the telecommunications service regulatory environment.

The first factor provides the context within which the second operates, and both provide the context for the operation of mobile services in Nigeria. There is no doubt that Nigeria has witnessed tremendous and unprecedented expansion of mobile service industry in the first half of this decade. This development was triggered by the deregulation of the telecommunications sector, which produced the first set of private licensed telecommunications operators. The first two such operators, including MTN and Econet (later Vmobile and now Celtel), started Global System for Mobile Communication (GSM) service almost immediately.

This study is an attempt to compare the M-Learning services of the two service operators within the context of Nigeria's general learning environment and vis-à-vis Nigerian regulatory provisions.

II. METHODOLOGY

The data used for this analysis were collected through unstructured interview, content analysis (including visits to websites) and observations. Given the obvious sensitivities, in some cases apparent suspicions, of my target respondents, there was no option than to resort to the use of unstructured interview with some willing staff of the two organizations. While this situation constitutes some constraints to my data collection efforts, there was some mitigation from the organizations' websites (<http://www.mtnonline.com>[1], and <http://www.tp.vmobile-Nigeria.com>, or <http://www.ng.celtel.com>[2]) and content analysis of their documents.

Questions and follow-up questions were generally raised in the following areas: brief history of their organizations, their objectives, operating licenses/conditions, area of coverage, infrastructure, workforce, mobile learning services/learning programmes/content provisioning-development/WAP/WASP, access terms, target subscribers, problems/constraints faced, and methods of addressing the problems/constraints. Much of this information already existed on their websites and print documents, but in some instances clarifications had to be obtained directly from the organizations. All the relevant data collected from the aforementioned sources were organized, presented and discussed under the subheadings that follow.

III. THE OPERATING ENVIRONMENT

It is important to understand the contexts within which mobile service providers, especially their M-learning component, operate in Nigeria. The effectiveness of m-learning service operation depends on a number of factors, all of which spring from the question of the existence of enabling operating environment. The first set of factors relate to the general structural conditions of the country, i.e. the economic, political and socio-cultural level of the people, who constitute both the actual and the potential subscribers to the service; and the state of the infrastructural facilities (stable power supply system, relative security, physical accessibility to remote areas, etc.) which constitute the basis for the establishment and development of the service. Indeed, it is noteworthy here that embedded in the socio-cultural conditions of the people is the state of the general learning environment, which is central to the development of any form of learning programme, especially m-learning that requires relatively sophisticated approach.

The second factor is the regulatory environment, which defines and regulates the operation parameters. The authority for the management and application of the

regulatory (or legal) provisions, vested in certain agencies or institutions no doubt derive from the logic of control of excesses or violations of some rights. As such, the legislative processes (democratic as they may appear) for the enactment of these regulatory provisions, and the internal consistency of these provisions are necessary concerns with regards to the operating environment. Similarly, how these agencies exercise the regulatory authority, the level of harmony that exists between the functions of such different agencies, and their capacity (in terms of funding, expertise, and facilities), all have significant implications for this environment. To characterize both the general and specific contents of m-learning in Nigeria, it is necessary to elucidate and put each of these points in perspective which entails, in the holistic sense, Nigeria's geography, history, politics, economy, and cultures.

In recent years, telecommunications industry, especially mobile operators, seems to dominate the Nigeria's investment arena. In terms of attractiveness it is second only to oil industry, but apparently growing faster than the latter. Three major reasons – demography, geography, and “democracy” – may explain this development.

With 140 million people (2006 census)[3], Nigeria has the largest population in Africa. Nigeria is characterized by diverse peoples and cultures, with 410 languages and dialects (Drum Magazine, 1998:vii)[4] spread across the expanse of the country. While the country has huge natural (agricultural and mineral) resources, two-thirds of its population struggles to survive on less than one dollar per day (Saint et al, 2003:260)[5]. Obanya (2003:46)[6] cited UNESCO to illustrate the literacy situation in Nigeria as declining from 57% in 1990 to 49% in 2001, much lower among women and rural population, who, according to Varvar (2000:80)[7] constitutes over 80% of Nigeria's population.

A survey of international businesses working in Sub-Saharan Africa conducted by the Center for International Development and cited by “Reference [5]”, found that Nigeria is one of the most difficult countries in the world for private business. “Reference [5]” observed that “on balance, the material conditions for development appear to be available, but the human and cultural conditions that enable development to occur are not yet in place... Available data indicate low levels of investment in research capacity and education, and help to explain why the country's non-oil economy has remained consistently sluggish during a decade of international economic expansion.” Reference [5]”quoted Onweh (1997), who reported that “School dropout rates have been rising and educational standards have reportedly declined”. Access to primary, secondary and tertiary education remains constrained, with just over 50% of all children enrolled in primary schools completing, less than 50% of secondary school ages attend school, and just about 4% of the relevant age cohort enrolled in Higher education. “Technical education”, according to “Reference [5]”, “is substantially neglected by policy makers”---in short: “The elements of a national innovation system are clearly not yet in place. In this, politics has played a part”.

The serious effects of under funding education were highlighted by Obikoya (2002:40-48)[8]. The general outcome is the deterioration of teaching and learning conditions consequent upon lack and/or deterioration of

physical and infrastructural facilities (electricity, water, roads, classrooms, laboratories, libraries, ICT equipment, etc), curricula, quality and quantity of staffing, research and publications, general teacher motivation, professional integrity and students' conduct and confidence.

In terms of geography, Nigeria is equally favoured by nature. Strategically located on the West Coast of Africa, Nigeria covers an area of about 924,000Km². It has varied geographical features, climatic conditions, topographical features and vegetational patterns across the 36 states and Federal Capital Territory (FCT). It is blessed in terms of relative ecological stability, good landscape and easy-to-move terrains, weather predictability (all year round), and high degree of freedom from natural disasters.

In spite of all these movements are highly constrained as a result of poor road network infrastructure, inaccessibility to remote and water-locked/riverine areas, undeveloped rail and waterways, highway insecurity, and expensive air transportation. In fact, movements of people, ideas, goods, and services are highly restricted, thus producing negative effects on the people's capacity to harness their vast productive potentials to develop agricultural and mineral resources that abound across the country. The net effect of all this is a serious constraint on productive economic activities – low productivity and poor capacity utilization, unemployment, and mass poverty.

Within the context of oil economy, prosperous as it apparently is, a population about 20% that of the entire African continent, and a vast expanse of land with good topography climate and ecology, mobile service providers have every reason to find Nigeria attractive, disregarding all the associated risks enumerated above. The derivable benefits, especially with the coming of “democracy” and its associated liberalization, privatization, and investor confidence generation, no doubt outweigh the constraints to be encountered.

Nigeria's “democracy”, which came on the wings of globalization, and took roots in the anti-military sentiments, no doubt played a role, even if not decisive, in providing a liberalized environment for mobile service operation. The establishment of the National Council on Privatization under the chairmanship of Nigeria's Vice-President and its implementing organ, the Bureau of Public Enterprises (BPE), and specifically the setting up of a 22-member Telecommunications Sector Reform Implementation Committee under the chairmanship of the Minister of Communication, on February 1, 2000 (one year after the inauguration of “democracy”) (National Telecommunications Policy 2000:3)[9], brought high spirits to prospective investors in Nigeria's telecommunications industry.

Besides, the mobile service operators capitalized on the circumstances of the transition period to extract huge concessions in terms of licensing terms, tariff charges, tax, etc. There was a gap created by the legislative process to change the regulatory (legal) framework from military decrees to Civil Acts. This process was completed only in 2003, during which period, the Nigerian Communications Commission (NCC), Nigeria's regulatory agency, was inevitably constrained by the largely irrelevant regulatory provisions inherited from military regimes. The ultimate victim was the consumer who had to pay the price because

of this gap, which created the conditions that made mobile services in Nigeria the most expensive in the world. Tariff regime permitted a per-minute, rather than per second, billing system for over three years without options to consumer, thus allowing the service operators to make huge profits at the expense of the consumer, despite claims by the operators of unusually harsh operating conditions, including extraordinarily high overheads as a result of infrastructural inadequacies.

Thus, “democracy” provided the enabling environment for the mobile service operators through pursuing liberal and favourable policies as provided in the Nigeria’s National Telecommunications Policy (2000):

The liberalization Policy of Government shall be pursued vigorously to attract private sector participation in the telecommunications sector. The tariff structure shall be market driven, enabling service providers and operators to recover their investments over a reasonable period of time, in an open and competitive manner (p.58).

The policy also provides that:

“Government shall provide incentives to investors to enable them grow rapidly and efficiently”, i.e.:

- Taxes and import duties shall be no less attractive than those for essential electrical and electronic goods;
- Simplification of procedures and requirements for the importation of telecommunications equipment;
- Granting of pioneer status to qualified investors in the telecommunications sectors; and
- Government shall ensure that the NCC simplified licensing and regulation procedures to encourage rapid inflow of private investment (pp58-59)

It is clear that the attention of the NCC, and by extension, that of the Nigerian government was more on putting in place policies making telecommunications environment attractive to investors and establishing the more conventional services than on the nature and content of the services. Apart from general statements such as: “Government will encourage the development of telecommunications services in the rural areas to promote rapid socio-economic development--our educational institutions will be afforded access to basic and advanced telecommunications services in order to enhance and sustain educational standards nationwide” (p55), there are no specific guidelines for, and commitments to, content development and provisioning.

This is the general context in which mobile service providers operate. How this situation impacts on their m-learning services can be discernible from the discussion that follows.

IV. MOBILE SERVICE PROVISION

This section is a systematic discussion of the data collected from the two mobile service providers (MTN and CELTEL). Discussion is based on the available data gathered from the sources mentioned under methodology.

A. *MTN Nigeria*

MTN Nigeria communications Limited is part of the MTN Group. It is owned 76.44% by Mobile Telephone Networks International Limited, 20.56% by Nigerian partners, and 3% shareholding by the International

Finance Corporation, the infrastructure investment arm of the World Bank.

It was incorporated in Nigeria on November 8, 2000 as a private company. It secured a license to operate digital (Global System for Mobile Telecommunications, GSM) telephony on February 9, 2001, from the NCC. It became the first to make a call on its GSM network on May 16, 2001. Thereafter, it launched full commercial operations beginning with the Nigeria’s three major cities – Lagos, Abuja and Port Harcourt. Today, MTN claims to be present in all the 36 states of Nigeria and the Federal Capital Territory (FCT) Abuja, over 290 cities and towns, over 15,000 villages and communities, and across many highways around Nigeria, which resulted in over 8,000,000,000 (Eight Million) active subscribers (Corporate Profile) 2006:13)[10]. The number of MTN’s active subscribers represents only about 5.71% of Nigeria’s population. Notwithstanding its expansion plans of additional 10million lines using a new allocation of 0806 numbering range, having exhausted the 0803 series, it represents only about 12.85% of Nigeria’s population (when the 10 million have been exhausted).

MTN has extensive transmission infrastructure. On January 20, 2003 it commissioned the first phase of its 3,400-kilometre Y’elloBahn digital microwave transmission backbone, with a planned second phase stretching to 4,500 kilometres. It has also embarked on the laying of fibre optic cabling covering over 2,000 kilometres all over Nigeria, and installed 34 mobile switching centres and over 2000 BTS sites across the country. To address the problem of power supply from the national grid, it installed its own power generation network consisting of over 3,800 generators to provide stable electricity supply to its core network and infrastructure “Reference [10]”.

MTN offers a variety of products and services on its prepaid and post-paid billing platforms to serve diverse interests. The most relevant services to m-learning include the following:

1. MTN Download for latest financial information, breaking news, sports news, etc; available to all subscribers on its subscriber Identity Module (SIM) or via its website.
2. MTN Fastmail SMS is a personalized e-mail account with a storage space of about 10MB. It is enabled to redirect email from corporate intranet to its account (MTN fastmail account) so that official mails can be accessed anywhere at subscriber’s convenience.
3. Wireless Application Protocol (WAP) allows access to the Internet via mobile phone while on the move.
4. Mobile Data & Fax and Enhanced Mobile Data & Fax

The first allows a subscriber to send a fax or document while the second is the enhanced version that allows both sending and receiving data and faxes on the move. They both work on the same principle of connecting a mobile phone to a laptop or personal digital assistant (PDA) and mobile access to the world of digital communication is open to a subscriber.

B. *CELTEL Nigeria*

CelTel Nigeria, formerly Vmobile Nigeria, was established in 2000, by a group of institutional and private

investors as well as three state governments. It is part of Celtel international, a subsidiary of MTC Group of Kuwait. On August 5, 2001 it became the first telecoms to launch commercial GSM services in Nigeria. In May 2006 Celtel acquired a majority stake (65%) in the company and re-branded to Celtel in September. Its network currently covers over 600 towns and 8000 communities across Nigeria, with over 5million subscribers.

CELTEL's value-added services, relevant to this discussion consist of the Voffice, which is made up of Vlink, Vmail and Vmail Plus and Vfax. This bouquet of services enables subscribers to send and receive data via the Internet.

1. VLINK-Network Connectivity Solutions: With Vmobile data card subscribers can have mobile access to the Internet as well as corporate networks such as the company intranet. Subscribers need to have, as pre-requisite to enjoying this service, a Vmobile data card, an Internet and Multimedia-ready PC, or Laptop with a PC manufacturer Interface Adopter (PCMIA)/ Network card slot, and a computer operating system (Windows 98, 2000 Me, xp, or NT4), and minimum of 30MB hard disk space.
2. VMAIL-Enterprises Email Solutions: this provides access to email subscribers' accounts – corporate and personal – while on the move. It provides SMS-Email and Email-SMS facilities.
3. Vmail Plus – Personal Information Management (PIM): this is based on General Pack Radio Services (GPRS) that provides users with constant access to personally programmed schedules of activities and Information between subscribers' computers and mobile phones. It allows for synchronization of personal information between the office computer and the mobile handset. Requirements for this service include a GPRS data subscription from Vmobile, a GPRS-compatible mobile phone or PDA, which must be run by specific operating system such as Ericsson Operating System, Vmail Plus application installed on mobile phone or PDA, sufficient memory storage space for the installation of the application, and sufficient memory storage space for sending and receiving emails and attachments.
4. Vfax-Mobile Fax Solutions: this provides fax services allowing for sending and receiving data on the move

V. M-LEARNING MOBILITY ON THE SCALE

It is clear from the foregoing descriptions that the value-added services of both the MTN and Celtel are based on essentially the same principles in most respects. The competitive environment may influence other variables, such as mode of operation, conditions of service, terms of access, coverage, and quality of service, but they are, at least, similar in many respects. The broader, and indeed basic, question, however, is the relevance of their m-learning contents to Nigerian situation, specifically to its development agenda-education, science and technology, industrialization, business, commerce, democracy, etc.

There is a salient point here to shift focus from the network providers that serve as transport medium to

content and information providers and developers, who provide m-learning content and structure. Wireless Application Service Provider (WASP) model is based on the same principles for all network providers in Nigeria. The NCC Guidelines and Regulations, based on the Memorandum of Understanding (MOU) with the Consumer Protection Council (CPC), stipulate the conditions for WASPS Operation in Nigeria and their relationship with CPC and network providers. One of the basic conditions is registration with CPC, as a supervising agency, and NCC, as a regulatory agency. A Content Provider Handbook describes the model, the basic principles, business rules, roles and responsibilities of each, hosting and connectivity, tariff bands, customer care service level agreements (SLAs), and registration process. The entire model was apparently developed with Nigerian situation in mind. However, the question of its applicability in terms of addressing the specific development needs of Nigeria remains valid.

In a knowledge-driven world, with every conceivable human endeavour defined as knowledge-based, education and Research and Development (R&D) is the only key to individual and national development. Salz (2007:2)[11] declared that:

The combination of wireless connectivity and educational content delivered according to the learner's location, requirements, and skills level may not be an app that kills, but it is a compelling one. Mobile devices allow everyone – and not just mainstream consumers, but also those (people) way out on the periphery – to learn and exchange ideas. Active involvement from content owners and providers can help connect a new, more Universal Social Mind, not to mention help build the demand for educational content.

Given the prevailing conditions in Nigeria, as in most developing nations, the question touches the core of not only high level, high skill, or professional (University or any tertiary) education, but also basic literacy, adult and nomadic education, as well as continuing education for all categories of people-working class/professionals, artisans, school dropouts, disabled persons, prisoners, patients in hospitals, etc., how and what each of these categories benefits from the M-learning services of these organizations depend not only on the availability, affordability, and relevance of these services to the consumers' conditions, but also on the country's structural conditions.

In the first instance, availability and affordability of services, including the mainstream services (Voice and SMS), despite the talk of "vast penetration", "unprecedented presence" and "extensive coverage" of mobile technologies in Africa, are still far from satisfactory. The combined coverage of the two largest mobile network providers (MTN and Celtel) in Nigeria is still just over 10% in terms of real consumption. A large segment of the population has been effectively deprived of mobile services by their conditions of existence: illiteracy and poverty.

Secondly, the question of relevance of m-learning content to Nigerian situation is apt coming at a critical stage of its development-political transition that ushered in liberalization with all its concomitant reforms in all sectors including education. In this context, how do the m-learning contents address mass illiteracy, health issues,

economic empowerment, education, etc? Are contents custom-made? How much local? How much general? How specific, how contextualised, how focused are they?

Apart from the general content of the Internet, both organizations have little to offer in terms of structured contents that address the issues above. In fact, there is virtually no specialized content provider that can offer, for instance, mobile educational content on medical or health training, or even business training e-learning content in Nigeria. While mobile content (especially local content) providers, in the general sense, are generally lacking in Africa now, specialized providers, the like of Giunti Interactive Labs (the Italian e-learning and new media company that delivers mobile educational content, "Reference [11]") will apparently take a long time to emerge. The emerging trend is the preponderance of content provisioning and development in the more vogous and popular mainstream areas like ring tones, wallpapers, games, etc,

However, the last point stresses the operating environment (i.e. the Nigerian States / Society) not as a passive victim of the circumstances, but as an active participant, a major actor, in creating such a circumstance. The Nigerian Society needs much more than ring tones, or even games, as mobile content, but the situation doesn't just change without the society articulating and placing its greater demands on content providers and developers. Only after the proclamation of such demands that a matching, indeed competitive, response follows. Such demands represent the inherent reflections that flow from the corporate actions or inactions, efficiencies or deficiencies and structural conditions of the country's socio-cultural, political, and economic institutions and agencies.

It may be too much to expect suitable and relevant m-Learning content for adult literacy or nomadic learners in a situation where "Much of university teaching is traditional with conventional curricular", and "content and method often outdated, unresponsive to employers' requirements, and disconnected from the labour market", "Reference [5]" asserted. Other levels of education share similar, in some cases, worse predicament. This is largely due to chronic under funding which cuts across all public institutions and agencies at all levels (Local, State, and Federal Governments).

This situation adversely affects the ICT culture generally in Nigerian educational system where students generally regard ICTs in learning as an alien culture. A significant proportion of Nigerian students, including university students and those in "privileged" private institutions have never been exposed to any form of technology for learning purposes. In schools where ICTs exist there are no explicit linkages with curricular content that allow their effective application to learning; there is a disjuncture between the ICTs and their use in education (James, 2004:61)[12]. This general lack of ICT integration into school curriculum in Nigeria makes M-Learning a project that requires a long-term investment to mature and take root.

Central to this is the role of the regularly agencies. In this regard, the NCC and the national Broadcasting commission (NBC), assigned with the responsibility of managing the regulatory environment, become strategic. While the NCC is responsible for the regulatory functions

of all forms of telecommunications technologies, the NBC is restricted to broadcast industry which include establishment, ownership or operation of radio and television stations, covering cable television services, direct satellite broadcast and any other medium of broadcast (NBC code 2002:7)[13]. The laws establishing them have clearly specified their functions. While the NCC was established by the NCC Act 2003[14], the NBC come into existence by Decree NO.38 (now Act NO.38) 1992, amended to Decree NO.55 (Act NO.55) 1999.

There seem to be no serious role conflict between the functions of the two agencies, but with increasing convergence of technologies, with the emergence of mobile television, for instance such conflict is inevitable. Apart from the Internet, which is the ultimate in convergence, mobile TV is already a reality, a boom waiting to happen (Ericsson, 2000:13) [15], which needs some regulation. Who does the regulating, how, and when, has implications for content (particularly local content) provision and development. There are implications for its incorporation into the school curriculum, and in fact, for the role of ICTs in Nigerian learning system generally.

The failings of these regulatory agencies have been generally blamed for the poor ICT development, underdeveloped, in fact arguably deteriorating, ICT culture, and specifically lack of ICT integration into the learning process in Nigeria. Some of the obvious omissions and commissions of the regulatory agencies include, on broad basis: (a) the failure to enforce the provision of the Acts as a result of insufficient manpower, inability to establish a case or to follow it up through the judicial process, and (b) indirect connivance with the defaulting operators in the name of liberalization.

The first instance shows the weakness of the regulatory agencies as public institutions. They require special equipment and specialized technical expertise in different areas, and their functions cut across the length and breadth of Nigeria. Yet, they suffer from under funding and often undue interference from "above".

The consequences of the first play a great role in the second. For instance in their effort to generate revenue to supplement the government subventions, they look the other way to allow the network and service operators to unilaterally deregulate tariff regime and charge arbitrarily and exorbitantly, and/or degrade service quality without corresponding reduction in charges. All these happened in the early years after the inauguration of the MTN and Celtel. There was public out cry that subscribers were massively short changed while the NCC looked the other way. Apparently supported by the national telecommunications policy, the NCC was simply "enabling service providers and operators to recover their investments over a reasonable period of time".(P.58).

There is no doubt that the effect of all this is the general under development of ICT culture, poor content development, lack of suitable and relevant m-learning content, and non application of ICTs to learning system. Despite the national effort to promote ICTs by setting up the National Information Technology Development Agency (NITDA) [16] to implement the National Information Technology (IT) policy, there has been little change in the situation. The mobile Internet Unit (MIU) set up by the NITDA to promote ICT awareness and use

through m-learning had constraints right from its inception. Established in April 2001, it was not launched until March 2003, and after about 3 years of restricted visibility (between Abuja and Lagos), it seems to be gradually fading into obscurity, where it has been for most parts of Nigeria since its inception. Although its m-learning programme is general, i.e. based on the internet, and not contextualized, which is, in our sense, less relevant to Nigerian situation, it still has the potentials of creating awareness of the role of ICTs in learning process, has it been expanded to cover more areas.

VI. CONCLUSION

In the last half of this decade Africa in general and Nigeria in particular, have experienced an unprecedented penetration of telecommunications business especially mobile technologies. Global System for Mobile (GSM) communications has brought a lot of transformation in the world of mobile telephony, SMS and other value-added services in Africa. Yet, the concept of mobile learning (as a structured process) remains largely unknown. Both MTN and CELTEL's services were found to be short of the m-learning programme in the sense discussed here.

The discussion above attempted to explain the situation in Nigeria in terms of two basic factors. The first arises from the state of the Nigerian learning environment, which is still largely traditional and unaccommodating to such innovation that requires coordinated efforts, articulated strategies, and infrastructures for its effective functioning. Education system, which should be the main focus of m-learning, is wallowing in under funding, traditionalism, lack of basic learning infrastructures, and absence of ICT culture, on which m-learning depends. The carry-over effect of non-ICT culture reflects in all facets of national life – private and public.

The second factor arises from the telecommunications regulatory environment, which is constrained by a number of obstacles- political, technical, manpower and socio-cultural. Their inability to ensure effective implementation of national telecommunications and related policies, especially aspects to do with ICT awareness and development, content development and provisioning, integration of ICT into education and all learning systems, and enforcement of regulatory provisions that facilitate access and affordability of services, stem from these obstacles.

The two mobile service operators (MTN and CELTEL) discussed here operate in this context. While they are necessarily affected by these factors they too have their own problems. There is no doubt that their primary motive as investors is profit, but the situation often lends itself to their exploitation which they often readily subject to their advantage. In fact, one area that suffers neglect from both operators is m-learning (relevant, contextualized) content development and provisioning, because it is not a service that sells as fast as telephony, or even ring tones download.

Considering the increasing complexity of human activities in today's world, the promise that m-learning holds, and the impending boom of mobile technologies that is to happen soon and inevitably, the paper recommends that:

1. Nigerian government should reinvent its educational system to integrate ICTs into the curricular at all

levels of education and ensure the provision of the necessary conditions and infrastructures for their effective functioning.

2. NCC and all other related regulatory agencies should coordinate and ensure the effective implementation of all relevant national policies and their review on regular basis; and
3. MTN and CELTEL in particular and all other mobile service operators should give priority to the development of local and relevant educational m-learning contents that promote Nigeria's development agenda. The need to redirect their promotion efforts and re-channel their promotion investment to people-oriented e-learning development should be underlined now.

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