STRENGTHENING ENTREPRENEURIAL EDUCATION WITH APPROPRIATE EDUCATION TECHNOLOGY AND TRANSDISCIPLINARITY: NIGERIA'S PERSPECTIVE

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Abstract

Rather than graduate from school into fulfilling life, the lot of an average fresh African graduate is unemployment, disillusionment and resentment because he acquired unmarketable education devoid of efficient and functional life-skills for job creation and poverty reduction. Education sector is breeding a growing army of unemployed graduates comparable to weapons of mass destruction in Africa. Using the critical, theoretical and documentary research methods, this study reviewed secondary data

on education explosion and implosion in Africa and unemployability of school drop-outs, scholars-leavers and graduates. Explosive education expansion was typified by 334-740 % annual student populaton growth rates for 4 to 5 decades running in some universities in Nigeria. Generally, the number of students in the university rose by 102.8 % between 2001 and 2004. Between 2001 and 2005, the number of secondary schools rose by 173 %. Between 2001 and 2003, the number of secondary school tutors rose by 228.6 %, while the number of university equivalent instructors rose by 116 %. Between the 1960s and the 2000s, the number of subjects taught in primary schools rose by 333 % and by 100 % in secondary schools. From the mid-2000s, however, education implosion began to manifest in double-digit unemployment rate for graduates, dearth of infrastructure, school desertion by learners, plateaued or declining student population amidst 3.2 % rate of national population growth, high rate of boy-child dropout from school, brain-drain, among others. The study also examined and recommended mainstreaming appropriate education technology and transdisciplinarity as a way out of the crisis and as the basis for defining alternative development paradigms for Africa.

Keywords: *Education explosion and implosion; Enterpreneurship education; Appropriate education technology; Transdisciplinarity; Nigeria.*

Introduction

Georges Danton [1759-1794] (in UNICEF, 1999) submitted that education is the second need of people, after bread. Victor Hugo [1802-1885] (in UNICEF, 1999) asserted that he who opened a school door, closed a prison. A Nigerian proverb (in UNICEF, 1999) has it that a bleak future

awaits an untrained child. UNICEF (1997) noted that education was the key to literacy and the basis for all progress, for individuals, communities and countries.

Apparently conscious of these truisms, African nations began to provide access to education in the past 4 to 5 decades. Efforts to universalise education in Africa started when Nigeria and some other African countries became signatories to the Universal Declaration on Human Rights of 1948, which emphasised the right of every citizen to education and on compulsory and free access to basic education. In 1955, the Western Regional Government of Nigeria launched the Universal Primary Education, while the Eastern Regional Government followed suit in 1957 (Enueme, 2004).

In April 1959, the Ashby Commission was set up to identify the manpower needs of Nigeria over the next twenty years (1960-1980). Its report led to the establishment of five universities in Nsukka, Zaria, Ile-Ife, Lagos and Ibadan in the early 1960s. Eight other universities came on board in the 1970s in Benin, Jos, Maiduguri, Ilorin, Sokoto, Port Harcourt, Calabar and Kano. More universities were established from the 1980s to date by the Federal, State Governments and private practitioners (Eneh, 2009).

Primary and secondary feeder-schools were equally given attention. Consequently, pupil enrollment in primary schools rose by 250 % between 1975 and 1980. Between the 1960s and the 2000s, the number of subjects taught in primary schools rose by 333 %, and by 100 % in secondary schools. Student enrollment in secondary schools rose by 56.4 % between 1960 and 1963. The number of secondary schools rose by 173 % between 2001 and 2005. Between 2001 and 2004, the number of students in university equivalents rose by 65.7 %, while the number of students in the university rose by 102.8 %. Between 2001 and 2004, the

number of tutors in secondary schools rose by 228.6 %, while the number of university equivalent instructors rose by 116 % (Obanya, 2000; Olaitan, 2003; Enueme, 2004; NBS, 2006; Eneh, 2008).

Undergraduate population rose by as high as 740 % per annum for 52 years running in one of the universities in Nigeria. Similarly, departments and faculties rose astronomically in number over the period (Mbanefoh, 2003). So were students that graduated from these schools.

Job skills are important in making education viable. They are primarily acquired through four media, namely, education, formal vocational training, short training courses and accumulated career experiences. In recognition of this, the Nigerian government put both policy and structure on ground for skills acquisition in prisons, school laboratories, Trade Centres, Monotechnics, Polytechnics, Vocational Teacher Education Departments, and Student Industrial Work Experience Scheme (SIWES) managed by the Industrial Training Fund (ITF) (Eneh, 2010). The Government also encouraged workers to undergo various in-service training and trade tests for skills acquisition and self-improvement, and provided for out-of-school skills acquisition programmes. For instance, the Government embarked on "Crash Programme" - short-term skills training for youth for adoption of foreign technologies in the late 1970s (Eneh, 2009a).

At various junctures, successive Nigerian Governments also embarked on other interventionist measures to tackle unemployment and reduce poverty. They include establishment of the National Directorate of Employment (NDE), the National Economic Reconstruction Fund (NERFUND), the People's Bank (PB), the Community Bank (CB), the Mass Mobilisation for Social and Economic Recovery (MAMSER), the Small Enterprises Development Agency of Nigeria (SMEDAN), the National Poverty Eradication Programme (NAPEP) and the National

Economic Empowerment and Development Strategies (NEEDS), which has the State and Local Government arrangements as SEEDS and LEEDS respectively (Eneh, 2009a).

The government of the old Anambra State (now Enugu State, Anambra State and most parts of Ebonyi State) establshed the Voluntary Service Agency (VSA). This and similar programmes were also aimed at technical empowerment of school-leavers and graduates for economic self-reliance (Eneh, 2009a).

Since the mid-2000s, however, the relative success of these efforts to provide education access began to backfire. Dated and irrelevant curriculum, funding neglect, overpopulation-induced infrastructural decay and brain-drain networked to ensure that the products of the school system were half-baked and sufficiently unmarketable. Unemployment rate has been growing rapidly among school-leavers and graduates due to their acquisition of unmarketable education devoid of efficient and functional life-skills for employability, job creation and poverty reduction. School-leavers and graduates are misfits for most parts of the job market and the needs of the immediate environment. It is, therefore, understandable that student population either has stabilised or is declining. Boy-child dropout of school has become a worrisome issue, especially in Southeast Nigeria. Internal and external brain-drain is also taking a toll on instructor strength, which has dwindled since the mid-2000s.

The quadruple challenges of imploding economies, deepening and widening poverty, climate change, and disappearing environmental assets (natural resources and biodiversity) around the world have necessitated a careful rethinking of knowledge platforms and development pathways at global, continental and national scales. This study used the critical, theoretical and documentary research methods to link these challenges to dysfunctional education received by school-leavers and graduates in

African countries, where appropriate education technology (AET) and transdisciplinarity (Tdp) are neglected. It recommended that science and technology education experts and policymakers need to adopt the duo at all educational levels and as the basis for defining alternative development paradigms for Africa. After this brief introduction, the remainder of the paper is structured as follows: conceptual and theoretical frameworks, education explosion in Africa, education implosion in Africa, the failure of government remedial measures and the need for AET and Tdp, and the way out, recommendations/conclusion.

Conceptual and theoretical frameworks

Implosion

Implosion is a violent inward collapse of a vessel or structure, resulting from the greater external pressure exerted against the internal pressure, or complete economic or political collapse, as a result of, e.g. poor management and financial insolvency (Encarta, 2009). Most African countries are experiencing education implosion, manifesting in decay in the sector and dysfunctionality of its products (Eneh, 2009). Unmet demand for marketability from mounting external pressure has caused the education system to cave in.

Appropriate education technology

Technology is a tool, machine or method used to undertake activities in nearly every aspect of life, including growing crops and preparing food, harnessing energy, collection and purification and storage of water, and building structures, among others (Eneh, 2012). Appropriate education technology is a teaching tool that uses the rich environment as a source of teaching/learning materials to impart on learners the knowledge, skills and

attitudes of the world around them through personal contact and experience. It does not place emphasis on the study of books and charts or passing examinations, but on acquisition and application of science knowledge, skills and attitudes for the purpose of improving the environment and the learners' living conditions. It emphasizes abilitiy to explain, show, grow, demonstrate, name, think, and describe among learners. It encourages repetition or practice of activities by individual learners at home and at school. It encourages activity-based teaching through learner investigation, experimentation, exploration and demonstration. It adapts the syllabus to the existing circumstances of the environment. It aims at the brand of teaching that changes student attitude and behaviour – and not accumulation of head-knowledge. It employs a spiral approach to recycle key topics for different age-levels of learners for gradual and thorough acquisition of the desired skills and attitudes. It relates the subjects to local conditions, bringing the village into the classroom and marrying the school to the community. It embraces conservation education to improve natural resource management and reduce environmental damage. It is the backbone of true education as a process of experiencing for purposeful transformation and reformation of the learner (Eneh, 2009).

Transdisciplinarity

The concept of transdisciplinarity refers to an education approach that extends across disciplines or involves more than a discipline. It recognizes the need to incorporate other branches of knowledge in order to learn and practice effectively a particular discipline. It emphasizes the interdependence of disciplines, as against vertical education (mono-disciplinary certificate education) (Hornby, 2001).

Education explosion in Africa

The single most significant development achievement of Africa is educational expansion for access provision. The case of Nigeria, the most populous African nation, illustrates this submission. The University of Ibadan, for instance, had 104 foundation students in 1948, but 40,000 students in year 2000 (Mbanefo, 2003). This means a stupendous 38,461 % student population growth in 52 years or a staggering 740 % average annual growth rate. Similarly, the Nigeria's first indigenous university, the University of Nigeria, Nsukka, started in 1960 with 255 students in 6 foundation departments (Economics, Mathematics, Political Science, Sociology, English and History) in 3 faculties (Social Sciences, Natural Science and Arts). Forty years later, it had 30,047 students and 100 departments in 15 faculties (Eneh, 2008). This means a student growth of 13,350 % in 40 years or an average annual growth rate of 334 %. Departmental growth was 1,667 % in 40 years or 42 % average annual growth rate. Faculty growth was 500 % in 40 years or 16.5 % average annual growth rate (see Table 2.1.)

Table 2.1: ***Growth rates of student population, faculty and department in selected Nigerian universities***

University	Time range	Student population		Faculty		Department	
		Total	Annual	Total	Annual	Total	Annual
University of Ibadan	1948-2000	38,461 %	740 %				
University of Nigeria	1960-2000	13,350 %	334 %	500 %	12.5 %	1,667 %	42 %

Source: Mbanefoh, 2003; Eneh, 2008

From the first tertiary institution of learning in Nigeria, Yaba Higher College, established in 1934, and the University College, Ibadan,

established in 1948, there were in 2007 about 91 degree awarding institutions, and about 156 monotechnics, polytechnics and colleges of education. As at 2004, there were over 40,000 public primary schools and about 6,387 public secondary schools. Primary school pupil enrollment rose by 45 % from 6 million in 1975 to 8.7 million in 1976/7 session, and by 20 % from 12.5 million in 1978/9 session and 15 million in 1980 (Enueme, 2004; Edukugho, 2007).

After the introduction of the Universal Basic Education (UBE) programme in 1999, pupil enrollment in primary schools rose by 15.9 % from 17 million in 1998 to 19.7 million in 2002 (Obanya, 2000; Olaitan, 2003; Enueme, 2004). The number of primary schools rose by 20 % from 49,306 in 2001 to 59,174 in 2003. The number of secondary schools rose by 74.3 % from 6,292 in 2001 to 10,964 in 2004. The number of university equivalent institutions rose by 9.2 % from 163 in 2001 to 178 in 2004. The number of universities rose by 23.5 % from 51 in 2001 to 63 in 2003, and by 27 % from 63 in 2003 to 80 in 2005 (NBS, 2006).

Table 2.2: ***Learner population growth***

School class	**Time range**	**Growth (%)**	
		Learner enrollment	**Annual growth rate**
University	2001-2004	102.8 %	34.3 %
University equivalent	2001-2004	65.7 %	21.9 %
Secondary	1960-1963	56.4 %	19 %
Primary	2001-2003	33.7 %	17 %

Source: Eneh, 2008, 2009

Student enrollment in secondary schools rose by 56.4 % from 135,434 in 1960 to 211,879 in 1963. The number of pupils in primary schools rose by 33.7 % from 19.3 million in 2001 to 25.8 million in 2003. The number of students in secondary schools rose by 41.3 % from 4.6 million in 2001 to 6.5 million in 2003. The number of students in university equivalents rose by 65.7 % from 350,000 in 2001 to 580,000 in 2004. The number of students in the universitis rose by 102.8 % from 36,000 in 2001 to 730,000 in 2004 (Table 2.2).

The number of teachers in primary schools rose by 22.5 % rose from 490,000 in 2001 to 600,000 in 2005. The number of tutors in secondary schools rose by 228.6 % from 140,000 in 2001 to 180,000 in 2003. The number of instructors in university equivalents rose by 116 % from 8,472 in 2001 to 18,199 in 2003. The number of university dons rose by 26.5 % from 18,867 in 2001 to 23,871 in 2003 (see Table 2.3).

Table 2.3: ***Teacher growth***

Teacher	**Time range**	**Growth (%)**	
		Total growth	**Annual growth rate**
University equivalent insructors	2001-2003	116 %	58 %
Secondary school tutors	2001-2003	228.6 %	114.8 %
Primary school teachers	2001-2005	22.5 %	5.6 %

Source: NBS, 2006

The scope of study also expanded. In the 1960s, primary schools were known with Language (reading and writing), Arithmetic and Nature Study (Mbanefoh, 2003). Today, they take about ten (10) subjects, showing 33.3

% increase. The secondary schools of the 1960s had about 12 subjects, but today, they have about 15 for conventional secondary schools and about 24 (100 % increase) for science, technical and vocational schools (NERDC, 2004). In addition, Population/Family Education, Normadic Education, Teacher Education, Vocational Education, Technical Education, Mass Literacy and other education programmes were also introduced at various junctures into the post-Independence Nigerian education system (NERDC, 2004; Enueme, 2004). Juxtaposing these rates against the 3.2 % annual population growth rate (NPC, 2009), shows expansive education access.

Education implosion in Africa

However, the result of education explosion in Africa is education implosion. In 2004 and 2005, pupil population in primary schools stabilised at 20 million, while student population in secondary schools plateaued at 6.2 million. Within the period, university equivalent student population declined by a whooping 58.6 % from 580,000 to 240,000, while university student population stabilised at 730,000. Due to teacher abandonment of school, secondary school tutors declined in number by 16.7 % from 180,000 in 2003 to 150,000 in 2004. University equivalent instructors declined by 9.3 % from 18,199 in 2003 to 16,499 in 2004 and 2005. University dons declined in number by 1.4 % from 23,871 in 2003 to 23,533 in 2005 (Table 2.4). This is only one of the numerous perils of internal and external brain-drain.

Table 2.4: ***Decline rates for learner and teacher population in schools in Nigeria***

School	**Time range**	**Decline rate**	
		Student	**Teacher**
Primary	2004-2005	0 %	
Secondary	2003-2004	0 %	16.7 %
University equivalent	2004-2005	58.6 %	9.3 %
University	2003-2005		1.4 %

Source: NBS, 2006

As was noted in an earlier report (Eneh, 2000), the basic education environment in Nigeria has not favoured the child. According to the report of the FGN/UNICEF (1996a), unconducive learning environments, absence of health and sanitation facilities, paucity of basic instructional materials and unmotivated teachers, among others, constitute the present weakness of primary schools. In general, school environments do not promote quality teaching and learning. About 77 % of the children had no textbooks, one third of them lacked writing materials, and 38% of the classrooms had no ceilings. In 47 % of schools, furniture was grossly inadequate and pupils sat on building blocks or were cramped in long benches without desks. About 77 % of schools had no potable water. In 59.8 % cases, water was obtained from wells. About 68 % of the schools had toilet facilities, half of which were ordinary pit latrines in poor condition. Although the National Policy on Education stipulates universal,

free and compulsory primary education, severe budgetary problems constrained the full implementation of the UPE Scheme within the current primary education framework. Even though, education enjoyed a high status in national budgetary allocations compared with other sectors, allocations for defence continued to consume the lion's share.

Add these to the unemployment problem of the school-leavers and graduates, schooling has lost the appeal, attraction, credibility and relevance. Hence, in addition to teacher abandonment of school, there is also high incidence of learner abandonment of school. Esan (in FGN/UNICEF, 1996b) reported that high drop-out rates among students of secondary schools, who had become "street-wise", was an alarming national trend. The boys dropped out in order to learn a trade to support the family, in the midst of deepening and widening poverty. The drop in enrolment rate for boys and girls, as they grow older, suggested that even those who did not withdraw from primary school, might not complete secondary education. Many of these children, who withdrew from school, became street traders, porters, barrow pushers, motor park touts or house-helps for the more affluent members of the society. As Atubi and Ali (2009) noted, in recent times, majority of the males among them increasingly took to commercial motorcycle or tricycle transportation called 'okada' and 'keke' respectively.

The girls might be pushed into early marriage or end up as prostitutes. Those, who remained in school, often had part-time jobs involving street hawking of bread, fruit, ice-water, groundnuts, among others, usually after school and during the weekends. This limited further the time they gave to studies, leading to higher exam-failure rates. This in turn, did not encourage them to read further. Having tasted life on the street, some children became too 'wise' for school and their parents. The extra money they made from their trading or labour might be spent on snacks, clothes, drink, cigarettes or even illicit drugs. Some even opted to stay away

from home, preferring to earn their own living, enjoy their freedom and dream of the day they would buy a fancy car. Their thoughts were not surprising in a society, where the ostentatious display of wealth had replaced intellectual excellence as a sign of success (Esan in FGN/UNICEF, 1996b).

The situation has not changed. Aja (2010) gave a recent report on mind-boggling statistics of boy-child abandonment of school to operate in the periphery or outside the mainstream education system, especially in Southeast geo-political zone of Nigeria. In 1996, the drop-out rates were 71 %, 69 %, 60 %, 58 % and 56 % for Anambra, Enugu, Imo, Abia and Ebonyi States respectively, as against 65 %, 65 %, 56 %, 57 % and 60 % respectively for the previous year (1995). Thus, the rates were increasing in all the States, except Ebonyi. On the other hand, the completion rates were abysimally low. For the junior basic secondary education, it degenerated from 38 % in 2001 to 34.8 % in 2005 for Abia and from 37 % in 2001 to 31.8 % in 2005 for Enugu. The rates also degenerated for senior basic secondary education for all the States, except Anambra, between 2001 and 2005 (see Table 5).

Parents identified the causes of high rate of school drop-out as peer influence, unemployment, poor remuneration for educated workers, capacity of illiterate men to acquire educated spouses (including Ph.D holders), poor learning conditions, and household poverty. Boy-children gave reasons for high incidence of school drop-out as inability of education to bring riches, poverty that disenables parents to afford school fees for their children, drive to make petty cash to augment family income and alleviate household poverty, and training being more appealing than schooling (Aja, 2010).

Table 2.5: ***Boy-child school drop-out and completion rate in Southeast Nigeria by States***

State	Year		Completion rate			
	1995	1996	2001		2005	
			Junior secondary	Senior secondary	Junior secondary	Senior secondary
Abia	57 %	58 %	38 %	31 %	34.8 %	30 %
Anambra	65 %	71 %	31.9 %	29.1 %	34.8 %	30.9 %
Ebonyi	60 %	56 %	33.1 %	30.9 %	33.9 %	29.8 %
Enugu	65 %	69 %	37 %	30.9 %	31.8 %	28.4 %
Imo	56 %	60 %	34.6 %	32.8 %	34.7 %	31.7 %

Source: Aja, 2010

This development has serious implications for nascent democracy in the country, since illiteracy, ignorance and poverty pose more serious threats to democracy than guns. The present deplorable prevalence of kidnapping and banditry in the zone is an expression of frustration emanating from a socio-economic system dominated by unguided minds that suffer from limited information in the information milieu (Aja, 2010).

Fig. 2.1 shows the vicious cycle of unviable education and its consequences. The craze for ornamental certificates devoid of functional skills leads to examination malpractices syndrome. Nigeria ranked number one in the world's examination malpractice index in 2011. The average annual examination malpractice index was 12 per cent. In the May/June 2012 school certificate examination conducted by the National Examination Council (NECO), a total of 615, 010 cases of malpractice were recorded, while 439,529 were recorded in the 2011 examination (Omeri, 2012), showing a whooping 40 % annual increase.

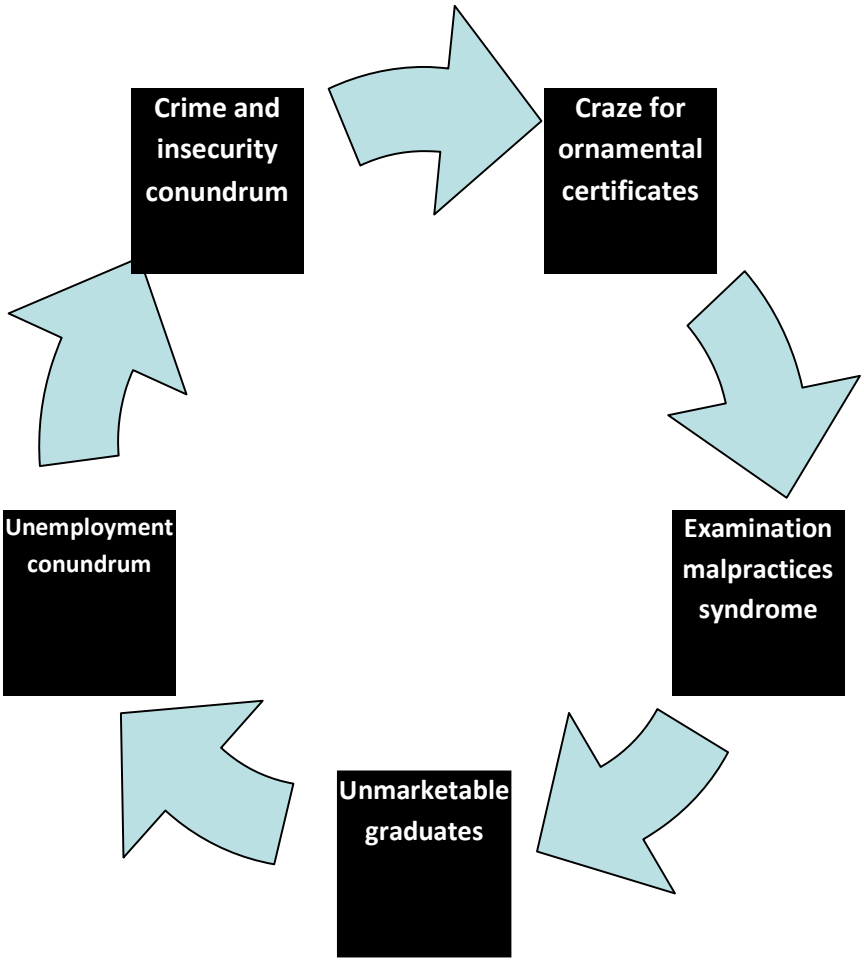

Fig. 2.1: Vicious cycle of unviable education and its consequences

At the tertiary education level, 'sorting' is the term used for irregular practices for obtaining undeserved marks in examinations. It takes various forms, including sexual gratifications, financial/material gifts, cult-assisted extortion of marks, among others. These unabating practices produce unmarketable graduates, leading to unemployment conundrum that results in crime and insecurity. The holders of the spineless certificates can only seek white-collar jobs, since they have no skills to employ selves or serve in the real sector.

As was rightly observed by Nigeria's Ministry of Education, the education sector is in shambles and there is the need for a total overhauling of the entire sector. The Ministry also rightly submitted that any nation whose educational sector is in crisis can never grow economically, and that any country that ignored the leading role of education in the drive for development risked producing citizens who could become weapons of mass destruction. Acknowledging that the quality of educational in Nigeria falls well below an acceptable level, the Ministry instigated a reform process to address key issues of access, equity and quality of education. The thrust of the education reform programme was to promote quality education and life-long learning relevant to the dynamics of global change through effective policy formulation and the setting and monitoring of standards at all levels; and delivery of tertiary education through federal institutions. To address the present anomaly in the education sector, the reforms programme would promote education that is, among others, efficient and effective, and functional for life-skills acquisition, job creation and poverty eradication (FGN, 2007).

This is in recognition of education as not only a process of transmitting the cultural heritage, but also a means of developing the entire person to enable him live effectively and efficiently in the society and to advance it for the future (Ukeje, 1984; Hanson, 1984). Education is

acquisition and utilisation of knowledge (Whitehead, 1984). It is not a matter of acquiring certificates, but functionality and utility. Meaningful knowledge is not ornamental, but must be utilisable. Knowledge must be acquired for application, not for decoration. It must impact and change the possessor, otherwise, learning has not taken place.

Education is a process of experiencing, which transforms and reforms purposefully. It is a process of developing sound character for the good of the society. It is change in behaviour. It is power bestowed on the possessor as the end product of experiencing. As a discipline or a body of organised knowledge, education addresses what should be taught (curriculum), why it should be taught (educational philosophy), how it should be taught (methodology), and to whom it should be taught (educational psychology) (Brameld, 1984; Dewey, 1984; Herbert, 1984; Kilpatrick, 1984; Loke, 1984).

The Nigerian education system has witnessed tremendous expansion in quantum of schools, learner enrollment, human and material facilities, and scopes of study. But, only diminishing learning is taking place, as their dropouts and products remain majorly unemployable and lack the drive and skills to live effectively and efficiently in the present, let alone to contribute positively to the future. The mind of the graduate is merely dangerously filled, like a vessel, with too much information – rather than being kindled, like a fire. The ideas blur together and become incoherent, leaving the possessor unchanged by what he knows.

While unemployment rate was 13.7% among the schooled, it was 12.8% among the unschooled in 2001. Specifically, unemployment rate was 8.7% among primary school-leavers, 13% among secondary school-leavers, 9.5% among graduates of tertiary institutions, 28.9% among 15-24 age bracket, 14.1% among females and 11.8% for all groups (NBS, 2006). Unemployment is being created because practical skills are not being

learnt and learners are not being transformed and reformed. There is no integration between the country's needs and its supply of school-leavers and graduates. For example, while policymakers in many African countries look to agriculture and private sector to spearhead economic growth, courses and textbooks – largely inherited from colonial masters – have little to do with farming and entrepreneurship (Eneh and Owoh, 2009). Thus, Nigerian Animal Science students, for example, are taught how to rear ostrich, which they may never come across in their lifetime. The Botany students are taught about strange plants existing in far away Western lands, whereas they cannot recognize the plants around them.

Besides inheriting textbooks that lack in home surrounding illustrations for effective learning, there are forces that deliberately or inadvertently challenge appropriate education in Africa. Firstly, the strong prejudice of the Africans, who had colonial education was strong and, frustrates the emergence of a coherent African indigenous educational policy, for their fear of irrelevance. As Moumouni (in Eneh, 2009) observed, opposition to Africanistic education philosophy stemmed from a kind of panic because of the difficulties a profound change in the educational system would entail. Secondly, neo-colonial forces of Europe and America were actively at work, especially as the pioneer key administrators and staff of African education institutions were mainly Europeans, Americans or those they had trained in their countries. Thus, while a university is anchored and grows on the social, economic, political, ethical, and legal environment of its society, African universities have swallowed in its entirety the external standards of Europe and America.

Consequently, the African university graduate, like the African graduate of the British university, is incapable of giving meaningful and productive leadership in his field in Africa, whereas British university

produces British leaders, who play major roles in shaping passions, ideologies and societal visions, in all fields of human endeavour in Britain. The difference is that education is in proper context in developed countries, but out of context in Nigeria. African universities are alien institutions in their own land. Their curriculum is designed for white-collar jobs (Eneh, 2009).

The erstwhile Ghanaian President, Kwame Nkrumah, (cited in Eneh, 2009) wanted African university colleges to cease being alien institutions in their own lands and to take on the character of African university. In spite of vaunted autonomy, African universities operate the models inherited from the metropolitan countries. The then President of the Democratic Republic of Congo, Mobutu Seseko, (cited in Eneh, 2009) submitted the need to emancipate the educational system in Africa from the Western mode by going back to the authenticity, while paying due attention to scientific knowledge. It is inappropriate to train African youth as if they were Westerners. African educational system ought to shape African youth according to African requirements. That would make them authentically Africans with African ideas, reasoning and actions, and they would see the future in African terms.

This has not happened because, according to Mazrui (in Eneh, 2009), the African university was conceived primarily as a transmission belt for Western high culture, rather than a workshop for the transfer of Western high skills. African universities are nurseries for a Westernised black intellectual aristocracy. Graduates of Ibadan, Dakar, Makerere acquire Western social tastes more readily than Western organization skills. Those graduates become steeped in Western consumption patterns rather than Western productive techniques. They are wordsmiths – and often despised blacksmiths!

Alluding to the brain-drain syndrome in Africa, Mamdani (in Eneh, 2009) was concerned that in the single-minded pursuit to create centres of learning and research of international standing, Africans nurtured researchers and educators, who have little capacity to work in surrounding communities, but who could move to any institution in any industrialised country and serve any privileged community around the globe with comparative ease. Failure to contextualise standards and excellence to the needs of Africans, to ground the very process and agenda of learning and research in African conditions, has ended up creating an intelligentsia with little stamina for the very process of development, whose vanguard Africans claimed to be. Like birds who cross oceans when the weather turns adverse, Africans have little depth and grounding, but maximum reach and mobility, such that when the going gets rough, 'educated' Africans get going across borders.

Mamdani (2005) observed that many African academics are willing to submit themselves to the exigencies of nationalism and the new state, which they view as the custodian of the development process and the university as an institution that must train human resources for development. It then seems natural to them that the state plays a key role in managing the university. Noting the general consensus among policy-makers and intellectuals on the basic tasks of the new nations, Bujra (1994) observed that it is not clear whether the knowledge produced by these institutions at the time has any direct or indirect contribution to the modest economic growth of most African countries.

The colonialists claimed universalism to justify imposing their history on the universities of their erstwhile colonies, to the disadvantage of indigenous history, culture, language and values. According to Mkandawire (2005), one-sidedness and racist historiography served the colonial ideological apparatus. Colonial historiography denied African

agency and was essentially an account of the itineraries of explorers, trade merchants, missionaries and colonisers. The African that imbibed this history is ahistorical because it is all about a glorious past, and asocial because it fails to deal with the social contradictions that drive all social history.

Besides the issues of history, lies the issue of language, culture and values, which should give Africa its own modernity and development. Ngugi wa Thiong'o (in Eneh, 2009) argues that in order for Africa to advance, it must rescue African memories from the clutches of the colonial past, whose vestiges still crowd out Africa's own memories and obstruct the vision of the future. African graduates need to reconnect to their societies. How does an African graduate, trained in languages of the erstwhile colonial masters, cease becoming one of the informed natives taking to the outside world, bearers of the memory of the colonisers, and become instrumental in turning African cultures into pillars of a self-confident Africa? Cultural embeddedness is important for the vitality and originality of the African graduate creativity. The inclination of African graduate is encumbered in content and dissemination by the weight of colonial languages in which he is groomed. Indigenous language is a vehicle for regaining Africa's memory, a crucial medium for harnessing human resources and grounding scientific knowledge in African realities. It is the only way science and technology can become part of the common sense and world-view of the wider African public and underpin the scientific and technological knowledge required for the development of the continent (Mkandawire, 2005).

Human resources are the linchpin of any development. In order for human resources to act as agents of change, however, they must be transferred, through education, into knowledgeable and skilled actors. Education takes place as a result of effective communication through the

medium of language. Hence, the importance of the question of language to development. Uprooting these adverse and inimical factors and placing Africans in the centre-stage in the history, culture, language and values of their continent is an urgent task in the construction of an intellectual arsenal for the liberation of the continent and the decolonisation of the mind in Africa. The impact of Western curriculum, history, language, culture and values inherited from the West for the Afrcian university education system are far-reaching. If African intellectuals are to rise to the challenges, then they will have to address the historical language legacy, which has made African intellectuals outsiders in their own society.

Africans in diaspora continue to grow from strength to strength because they were miseducated in foreign languages, history, culture and values, and are therefore, dysfunctional in their homelands, but at ease and at home in foreign lands, based on their training and orientation. Migration and globalisation have deepened the problem of brain-drain from Africa to the advantage of Europe and America. Zeleza (in Eneh, 2009) cites studies which indicate that, in the 1980s, an average of 23,000 qualified academic staff were emigrating from Africa each year. An estimate in 1995 had given the figure as 50,000. The contemporary academic diaspora in the United States and elsewhere in the North is becoming a force to be reckoned with (Zeleza, 2003). So are other categories of emigrant graduates, school-leavers and artisans.

African graduates cannot prove their mettle at home. They graduate as job seekers – not as resourceful graduate workers. They cannot even engage selves and create jobs, but may remain jobless and seek unavailable job for many years to come. They are neither employable nor enterprise-ready (Makinde, 2005; Gyamfi, 2006). As was pointed out in an earlier study (Eneh, 2009), if the African university products are mostly unmarketable, the research projects of such a

university must be also irrelevant to the private sector, with which the university ought to partner for research support, commercialisation of the research findings and mutual growth of both sectors for continental economic development.

Failure of government remedial measures and the need for AET and Transdisciplinarity (Tdp)

The efforts of Nigeria's Government to give viability teeth to the education sector include changing from one system of education to another. The country inherited from the colonial masters the 6-5-2-3 education system, whereby the child spent 6 years in primary, 5 years in secondary, 2 years in high school, and 3 years in university. This system was changed in 1988 to 6-3-3-4 system, whereby the child spent 6 years in primary, 3 years in junior secondary, 3 years in senior secondary, and 4 years in university. Ten years later (1998), the system was changed to 9-3-4, whereby the child spent 9 years basic school (6 years in primary + 3 years in junior secondary), 3 years in senior secondary, and 4 years in university (NERDC, 2004). The changes proved fruitless for various reasons enunciated by Onah (2006) and Eneh (2011), including incongruence between university curriculum and industrial production practices, lack of entrepreneurial culture, and education delivery technology that distances the classroom from the home and environment. Hence, the problems persists because the issue is not much of the education system, but the education technology.

Again, Nigeria's National Policy on Education wisely provides that not less than 60% of places shall be allocated to science and science-oriented courses in the conventional universities and not less than 80% in the universities of technology (NERDC, 2004). But, the encouragement

for the study of science, para-science, technology, and engineering in schools is not enough to address unemployment. For some time now, the emphasis is on entrepreneurial education. But, entrepreneurial studies has become more of an academic teaching subject than entreprenurial capacity building.

The need to strengthen entrepreneurial education with AET and Trandisciplinarity (Tdp)

All fields of study need AET to equip the learner for setting up micro, small and medium enterprises in their fields of study or related or familiar fields. It is the absence of AET, more than the absence of science, engineering, technology, vocational and technical education, that has made the dream of producing enterprise-ready school-leavers and graduates a mirage for over four decades running. Therefore, mainstreaming AET in the education system will engender entrepreneurship drive to build entrepreneurial skills, instill self-confidence in leaners, and empower and position them to tap into the numerous business opportunities around them.

Unlike the appropriate education technology, the current education approach in Africa does not use the rich environment as a source of teaching/learning materials to impart on learners the knowledge, skills and attitudes of the world around them through personal contact and experience. Rather, it places emphasis on study of books, charts or passing examinations to acquire fanciful but dysfunctional certificates. Acquisition and application of science knowledge, skills and attitudes for the purpose of improving the environment and the learners' living conditions is not an issue, nor is human capital development - virile education to develop the mind for sustainable appropriation and harnessing of the natural resources – given a thought in the current

education technology in Africa. Despite abounding natural resources in Africa, graduates are jobless and poor because they cannot tap the natural resources in their environment. In most cases, foreign companies take up the exploitation and exploration of natural ressources in Africa, with graduate Africans playing little or no role in this regard. The Local Content Policy adopted in some countries has not helped matters.

It is not amazing, therefore, that African graduates of Crop Science roam the streets as unemployed in countries with abounding and underutilised arable land. And, graduates of Animal Science lack the skill and drive to employ selves by keeping livestock at the barest scale. This situation can only be explained on the absence of activity-based teaching through learner investigation, experimentation, exploration and demonstration in the current education curriculum, which does not adapt the syllabus to natural environment and endowment, nor relate it to local conditions. It does not embrace conservation education to improve natural resource management and reduce environmental damage, hence the increasing disappearance of environmental assets (natural resources and biodiversity) in Africa.

A co-factor responsible for this unwholesome development is lack of transdisciplinarity in education approach. The current education system in Africa encourages verticality (mono-disciplinary certificate education). Little wonder, a medical or veterinary doctor, for example, after training for 6 to 7 years in the university, does not know personnel management for efficient operation of a personal clinic. After 4 or 5 years of studying production and synthesis of various materials, a chemistry graduate lacks entrepreneurship knowledge to start and grow a chemical process industry. Similarly, the fine and applied art graduate lacks the skills to set up and run an art studio successfully. Education graduate cannot dare to open and operate a school for lack of entrepreneurial drive and skills. This inability

to employ self is often excused away on lack and cost of capital, yet some of the unemployed graduates source the capital to travel abroad, sometimes for prostitution for quick money to massage their "get-rich-quick" mentality.

In Britain, it is still being advocated that children as young as nine years old should be taught trades, such as carpentry, construction, catering, hospitality, tourism and bike maintenance (Clark, 2007). On the other hand, a whole army of African youth passes through a 3-year nursery school programme, 3-year junior basic school programme, 3-year middle basic school programme, 3-year senior basic school programe, 3-year secondary school programme and 4-7 years of tertiary education programme without acquiring functional skills, but disaffection and resentment. National governments in Africa are yet to awaken to the reality of human capital development, which is the whole essence of education and the single most critical factor in socio-economic and political transformation required for the banishment of poverty, hunger and disease. There is yet little appreciation of the link between education and national development. In Nigeria, for example, only 8-12 % of the national annual budget and 5% of GDP is allocated to education (*Sunday Independent*, 2007). And, the aforementioned education reform programme, like most others, has suffered from policy summersault and poliical vision inconsistency.

The way out, recommendations and conclusion

The problem of acquisition of inviable education can only be addressed by adopting the appropriate eduction technology to factor in the environment and transdisciplinarity to allow indigenous culture, history, language and values to take the centre stage. The brand of education in Africa's school

system, which lacks in appropriate education technology, is not the Georges Danton's advocated brand – the second need of the people, after bread, nor the Victor Hugo's advocated brand that sets recipients free from prison. Rather, a bleak future awaits the freshly schooled and the unschooled Africans alike, as unemployment figures have shown. The school systen in Africa does not give the education that is the key to literacy and the basis for all progress, for individuals, communities and countries.

The quadruple challenges of imploding economies, deepening and widening poverty, climate change, and disappearing environmental assets (natural resources and biodiversity) in Africa, which have necessitated a careful rethinking of knowledge platforms and development pathways at continental and national scales, are simply a consequence of neglect of appropriate education technology and transdisciplinarity. Science and technology education experts and policymakers need to get the duo into the education curricula at all levels and as the basis for defining alternative development paradigms for Africa. This calls for designing science technology and innovation (STI) policies, programmes and strategies to support inclusive growth, employment generation, and sustainable development in Africa, have become imperative.

To make good global commitments to sustainable development in Africa, African countries need strategic transformative reforms from its present knowledge structure (mono-disciplinary certificate education) to trans-disciplinary systems studies, entrepreneurship and innovative capacity development, as well as development pathways that will enhance transitions towards poverty reduction and wealth creation for inclusive green growth and development on the continent. Africa cannot afford to remain a global consumer of obsolete education technologies that churn

out unmarketable school-leavers and graduates – potential weapons of mass destruction.

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