

IMPLEMENTATION OF NATIONAL POLICY ON EDUCATION IN NIGERIA: A FOCUS ON STM EDUCATION

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Abstract

The central thrust of this paper is to critically analyze the extent to which the National Policy on Education (NPE) has been implemented with regard to Science, Technology, and Mathematics (STM) education in Nigeria. Because STM education is one important field of study that has continued to gain increasing support in recent years as a benchmark for any society with serious developmental agenda, it is only but congruous that studies be conducted from time to time to evaluate the implementability or otherwise of such policies, with the aim of strengthening or re-positioning them for better results. This, the paper has done, showing a grotesque picture of the STM education, not only in funding but in the supply of men and materials, as well as in admission ratio due to poor implementation of the policies which are probably occasioned by poverty, colonial accident of our education, corruption and political uncertainties. A brief conclusion wrapped up the work after a number of recommendations were made.

Introduction

STM is an acronym for the disciplines in Science, Technology and Mathematics and teaching these disciplines to future teachers may unquestionably refer to STM education. The amalgamation of these disciplines into a single unit in the broad field of the study of natural phenomena is probably due to the high degree of symbiosis amongst them. Several authors' definitions of the disciplines only seem to differ in the degree of words used rather than in commonality of meanings.

Ali (2002), who prefers the term "Science" to be more of a verb than a noun, sees science as "processes of obtaining truth and/or applying the truth to an environmental phenomenon". Because the study of science is based on truth, it consistently provides facts, theories, laws and principles which when successfully applied in solving human problems, translates to what we call technology. This implies a kind of see-saw relationship since the technological standing of a people is tall only to the extent that science "feeds" it while science in turn grows only to the degree that technology poses challenges that (it) science is consistently apt to conquer. As for the definition of Mathematics education, Idu and Ezike (1999), had introduced us to a definition that may endure for a long time, thus: "a systematic programme of activities which include processes, procedures, methodologies, instructions, training... for successful acquisition, utilization and application of basic mathematical skills...."

Mathematics, so to say, is the arrowhead to both science and technology, hence, Harbor-Peters (2004), asserts that Mathematics is a sine qua non for the development of science. This is also the thinking of Ali (2002), who sees

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Mathematics as the mother of science and technology. His arguments: the structure, development and methods of science and technology are merely anchored in Mathematics through its algorithms (i.e. rules, order, trend, constants, and theorems) and it as well lends itself to various scientific and technological functions as in computing, commerce and trade, communicating, information technology, etc.

To ask, why the teaching of STM education in our institutions today, is no longer relevant since it is only the 21st century non-ally (if any) to the fight against diseases, illiteracy, superstition, speculation, intellectual ‘darkness’ and general backwardness that may be tempted to that question. This has made all nations of the world to strive in attaining a reasonable scientific and technological height through educational policies and programmes. Our own policies and visions for STM education in Nigeria are contained in the National Policy on Education (NPE) which at present has gone through many editions. There is a gap between rhetoric and reality, pledges and redemption, planning and actual implementation of the STM education policies.

Actually, this paper is intended to look into the policy ideals for STM education as contained in the NPE and the implementation realities on ground. To this end, the paper has been developed under the following sub-headings: NPE: The Antecedents, Birth and Policy Statements; Present Picture of STM education, Implementation Challenges, and Recommendation and Conclusion.

NPE: The Antecedents, Birth, and Policy Statement

It is natural that when a people gets confused and bereaved of functional education that it becomes more anxious and inquisitive at seeking after solutions. Such was our mood probably the years preceding 1977. In as much as it is defensible to assert that there was education in Nigeria prior to the exotic missionary and colonial education, doubt exists as to that education being formalized. The Western education, in summary, could be said to have “achieved quite a number of things for us except addressing our own unique needs as a people since we had no articulate philosophy of our own education” (Nwaokolo and Otubelu, 1998). Akin to this was that according to Nwana (1998), what appeared to be Nigerian educational aims and objectives existed in bits and pieces in various government laws, constitutions, circulars etc. and much of it could be said to have been implied rather than stated.

Consequent upon these lapses, a national conference on curriculum development was held in 1969 to formulate the philosophy for Nigerian education. Almost four years later, in 1973, a seminar on National Policy on Education followed which aim was to fashion a Nigerian-made policy on education across all levels. Happily enough, in 1977, these conferences and seminars resulted in the ‘birth’ of the National Policy on Education which according to Ukwungwu (2003), is government’s blueprint for using education as a tool for achieving national goal. “The mission statements of STM as contained in this education policy statement, at least, shows the extent to, which premium

was placed on this form of education” (Nwaokolo and Otubelu, 1998). In summary, the Federal government of Nigeria (2004), through her National Policy on Education (NPE) promised Science, Technology and Mathematics (STM) in Nigeria, quality teachers, admission preference and adequate funds and materials. In fact in the most self-referential manner, the NPE stipulates as follows:

- Specialist teachers for particular subjects such as science, physical education, domestic science etc. Government will increase the supply of such specialist teachers by providing adequate facilities in the Teacher Training Colleges (Article 15, sub-section 10(e)).
- The ratio of science to liberal Arts in our universities has been fixed at 60:40 in favour of science and technology (Article 39, sub-section 2).
- A greater proportion of education expenditure will be devoted to science and Technology (Article 39, sub-section 1).
- Making available materials and manpower for the teaching of science through introduction of science and provision of science laboratories in the Grade II Teacher Training Colleges in order to increase the supply of elementary science teachers (Article 15, sub-section 2(ii)).
- Equipping students to live effectively in our modern age of science and technology (Article 18, sub-section 16).

Notice should also be taken that section 6 of the 2004 edition of the NPE as a whole contains favourable policies addressed essentially to the technology education alone. If these policies are religiously implemented as they were ornamental in planning, one would stand to reason that STM education in Nigeria would know no bounds on the scientific and technological superhighways just like the Eastern tigers. But how have we translated these policies to action?

Present Pictures of STM Education in Nigeria

Much of the task of our presenting the picture of STM education in Nigeria today, is polarized on such factors as the quantity and quality of the teachers, admission preference, funding, and equipping STM education. It may perhaps serve a useful purpose to recite Ikegbuna (1998), as writing that, the essence of having quality and competent teachers is for us to have professionals who would be able to bring the paper policies to practical reality at the classroom level.

Literature is replete with substantial evidence that Nigerian schools have neither quality nor quantity STM teachers. Ifejika (1990), reported that, the NBTE survey of qualified teachers in technical Colleges throughout the Federation in 1989 showed that most staff recruited as teachers in the schools were artisans and unqualified personnel, the majority of whom do not possess pedagogical training. Parenthetically, the picture remains that contrary to the NPE’s hues and cry about the use of specialist-teachers in STM education, generalist-teachers have generously continued to be used at both high and low levels. At the basic level, we seem to have maintained an abiding faith with the

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teacher, who is regarded as an embodiment of all knowledge, to deliver the needed services as he teaches all subjects including science and Mathematics. At the secondary school level, the story is not better. The practice of using Chemistry teachers, for instance in teaching Integrated Science, Biology, Physics and Mathematics or assigning a Physical education teacher to exclusively teach Biology,

Integrated Science and/or Health Science, suggests a gap between the rhetoric and reality of the 'specialist-teachers' objective of the NPE. The competence and dedication of the few specialist-teachers are even in doubt:

They are not dedicated to their assignments. They give more time to trading, petty contracts, farming. Those class of teachers have no regard for the curriculum and the school calendar. Topics are selectively and hazardously taught. Tests and examinations are done on familiar questions and marks generously awarded to give the impression of good teaching (Onuoha, 1997).

The worst seems to have even happened that the teacher training Colleges through which the Federal government intended raising "thorough" science teachers are presently going into extinction especially with the present emphasis on glamorous "higher certificates" of our time.

A reliable litmus test for the realization of the admission policy of 60:40 ratio in favour of STM, is to judge how far or near the students' enrolment approximate the ratio. By and large, going by facts and figures, that mark seems not to have been hit. In the universities, Ogunleye (1999), had noted that in spite of the 60:40 admission ratio as promised by the NPE, it is regrettable that JAMB even till date hardly observed this ratio, for example in 1996 and 1998 only 44 percent of the total admission were in science and technology. The picture is even uglier in the Colleges of Education where Ukwungwu (2003), reports that, out of a total student population of 108, 017 in all the Colleges of Education spread across the entire country for the 1998/99 academic session, only 37,742 (34.9%) were in STM and STM-oriented courses. The missing difference of 25.1% in the proposed 60% according to him is a far cry from the government policy. The picture is even more disturbing in the recent years. According to the NCCE (2005), statistical Digest, out of a total population of 315,465 and 307,606 in all the Colleges across the country for the 2001/2002 and 2002/2003, only 45,425 (14.39%) and 47,142 (15.32%) respectively were in STM and STM-oriented courses. The guess of what the future percentages will be, resides only with God.

STM education seemed to have enjoyed what may be termed "financial honeymoon" with the government in the early 80's through the late 70's before 'divorcing' in the years following 1985 when Nigerian economy dwindled, and consequently, dwarfed Nigeria. STM education then became underfunded and the underfunding slide according to Ngoka (2000), coincided with the governments that ruled Nigeria since 1985. In fact prior to this era, Ali (1993), observes a steady progress in STM education to a point it would have been firmly rooted and strategic enough to serve as a springboard for national development and empowerment. The funding status of science and technology till date has been poor to a level that Ali and Akubue (1993), observed though laughably that Sweden spends twenty-five times to educate an elementary school pupil in primary science, compared to what Nigeria spends to educate a medical doctor. Further testimony to the breach of the NPE funding policy for STM education is given by the frequency with which all relevant institutions constantly clamour for better conditions of service. Ngoka (2000), seems to have summed the funding status by writing that funding in real terms has continued to decrease as the economy continued to plunge deeper and deeper into quagmire and that the demand for better funding has led to universities and polytechnics being closed for some considerable part of the year.

There is an impressive array of literature to the effect that STM teaching materials in our schools are inadequate where they may be found at all (Onuoha, 1997); Okebukola, 1985; and Bolorunduro 1997). The dearth of these materials especially at the secondary school level is often shown by the number of schools going about borrowing equipment to be able to get approval for WAEC O'level examination (Okebukola, 1985). Accreditation exercises in the tertiary institutions are also characterized by massive exchange of science and technology equipment among schools in order that the last domicile institution of the equipment gets full accreditation of courses. The sinking of Nigerian economy in the mid 80's was partly responsible for this level of science infrastructural facilities and equipment. Another reason according to Okebukola (1985), is the free policy of the 1970's which resulted in education explosion to the extent that many communities started secondary schools they could not maintain and service. The effects of the lack of STM teaching materials are always very glaring. Apart from finding limited need for schooling including the study of science and technology, Ngoka (2000), reports that, the students who used to be careful, methodical, engaging, serious, inquisitive etc where resources were plentiful and well managed, now become crazy, dishonest, uninteresting, and unmotivated.

Problems and Challenges to the Policy Implementation

Late 70's and early 80's witnessed an unprecedented increase in the attention placed on bringing to manifest most of the policies targeted at an enhanced status of STM in Nigeria but for a number of factors among which the National economic recession of the late 80's heads the list. Ali (2002), reports the World Bank as rating Nigeria as the 12th poorest country in the world as from 2000 and that as high as 69% of Nigerians are classified as poor. With these grotesque figures an idea suggests itself here that this near-to-hell poverty level in Nigeria must have had great 'hand' in the snail-speed of STM education policies implementation. Other admissible de-motivating challenges include historical accident of STM in Nigeria, the Nigerian factor and political instability.

Till date, the vestiges of our colonial heritage from Western education have continued to hunt us even down to implementing STM education policies. We inherited a marginalized STM education which has continually led to students' disinterestedness in, and phobia, for studies in it. The lopsided emphasis of the colonial education on liberal Arts at the expense of STM education helped in production of Catechist, liberal Art teachers, and ministers of the gospel rather than in development of vocational, science, and technology manpower. Even with the growing consciousness of the relevance of science and technology in the overall development of a people today, there is a high concentration of liberal Art administrators in the education sector than there are the STM administrators. Consequently, with the financial policy for STM education that a greater proportion of education expenditure will be devoted to science and technology, how many of the stakeholders in STM education are at the apex as Ministers and administrators to effect the policy even with other factors partialled out?

Still as a debris of our colonial education heritage, we have demified any study in STM as a study which successful achievement in, can be likened to squeezing water out of stone. Evidences abound: in 1992, 86% of the students

sampled by Hassan (1992), indicated that they would have dropped Mathematics were it not compulsory while in 1985, the figure was only 23%. Ngoka (2000), also reports that the total graduate output for all Nigerian Universities in science and technology as against the overall graduate output in all disciplines have decreased from 37% in 1985 to 8.9% in 1995. This declining interest in the study of STM, no doubt, serves as a de-motivating factor to a wholesome implementation of policies in STM education.

In a country like Nigeria where corruption and embezzlement of public funds are fast dissolving into heralded culture, it is hardly a dream-come-true that the idea of policy implementation be sustained. Federal government made some landmark efforts, at least, at addressing the problem of science and technology teaching materials especially in secondary schools but the Nigerian factors submerged them. These efforts were contracting out the supply of the equipment to contractors and the World Bank Project. According to Onuoha (1997), most of the contracts awarded either within or outside the country never realized the dreams since most of the contracts were executed on the pages of newspapers just to satisfy political ambition. As per the procurement through the World Bank Project, Onuoha (1997), further laments that, unpatriotism by way of indolent inspection of the goods at both foreign and Nigerian ports made the project a white elephant since some of the equipment came with some missing vital parts and even some that were received in complete form by some institutions have either found their way into the Nigerian supplier's shop or are safely and permanently packaged in their containers for reasons unacceptable in a serious country.

In addition, the popular slogan of "soldier goes, soldier comes, Barracks remain the same" seems not to be truly reflective of Nigerian polity with regard to policy implementations. Our many years of military regime under the leadership of draconic dictators and our few years of even pseudo-democracy never favoured a smooth and speedy implementation of STM education policies. Every regime on assumption of office hastily changes ministers and policies which is usually predicated on self-aggrandizement rather than on true implementation of educational policies.

Recommendations

The problems (challenges) that had faced the implementation of the NPE for the STM education in Nigerian schools are truly critical but are not altogether hopeless. Much depends on our collective willingness since these policies remain unimplemented not because of lack of relevance but because of lack of total commitment by the government as well as by the society, politicians, education - administrators, teachers, and students:

- (i) ***Conserving Funds through Active Commissions:*** Policies and their implementations revolve around availability of funds and as such what plunged Nigeria into economic quagmire must be uprooted before there is an easy implementation of STM education policies. The most referenced cause for that is corruption which came as a result of our laziness and laxity occasioned by the oil boom around the 70's. Although the later day ICPC and EFCC are already on ground against corruption in Nigeria, they rarely address cases of failed contracts and breach of contracts. If failed contract commission is created and given enough power and authority, it can go a long way to track down all STM education policy implementation detractors.

- (ii) **Balanced Appointments:** Akin to this is the need to have balanced appointments in the education ministry with regard to fields of study whereby every member oversees the disbursement of funds and the implementation of policies in their respective sectors.
- (iii) **Winning Students Over through Staff Motivation:** In the same way the manufacture of a good is not finished till it reaches the final consumers, so should it be with policy implementation process in STM education till the final consumers - science teachers and students - are there to receive the policy effects. Therefore, because there is a dearth of qualified science teachers with a declining students' enrolment into sciences which bear direct relevance to the pre and post independence emphasis on liberal Arts, there now arises the need to win students over to STM education through increased interest and incentive. Hazard allowances to staff and students of sciences would encourage retention. With this and similar incentives, the few science teachers through improved teaching would bring to life the simplicity and concreteness of science that had long been shrouded in mysteries and abstractions to the point that science in Igbo had been translated as "Ogbara Igbo yari", meaning, a fathomless field of study. With more science students, the 60:40 admission ratio in favour of STM will not only be feasible but encourage a speedy implementation of all policies there are in NPE for STM education.

- (i) **Policy Continuity through Legislations:** Presently in Nigeria, with the settlement of the second term -- third term tug-of-war in favour of second term of four years each (i.e. 8 years) at most for political office holders, there is the need for us all to embrace that and as well ensure through constitutional legislation that succeeding governments must be liable to litigations should they change for worse or fail to implement policies already established especially those relating to education among which STM education is paramount.

Conclusion

All in all, it is the opinion of the writer of this paper that since the balance weighing of the pros and cons of STM in the national development efforts seems to tilt heavily towards the former (advantages), all hands must be on deck towards making every imaginable sacrifices that would equate our studies in STM with those of the Eastern Tigers, thereby avoiding risk of running backward in a technologically fast moving world.

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