REPOSITIONING TEACHING OF INTEGRATED SCIENCE FROM ACCESS TO QUALITY IN THE BASIC LEVEL OF OUR EDUCATION SYSTEM: A TOOL FOR SELF RELIANCE IN A RECESSED ECONOMY

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Abstract

The paper examined the imperative of repositioning teaching of integrated science from access to quality in the basic level of our education system as tool for self reliance in a recessed economy. It further highlighted the philosophical reason(s) for introducing integrated science into our education system in the first instance. It also identified some of the teething problems confronting teaching of integrated science at the basic level of our education system to include; inadequate number of qualified personnel, policy inconsistency, ineffective curricula delivery, dearth of relevant infrastructure and learning materials among others. Recommendations were succinctly emphasized on the way forward.

Keywords: Integrated science, Basic level of education, Recessed economy, Qualified personnel, Access and Quality.

Education does not necessarily mean learning only how to read and write. It is rather more than that. Essentially, education which is considered mother of all professions and the basic raw material for all other forms of human and socio-economic development is nothing less than learning to live a healthy and worthy life, and the task of course is not an easy one. As a tri-polar in nature and the cornerstone for which any
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visionary nation’s plan for development is founded upon, education remains the most powerful weapon applied in changing the society for the better. No wonder, “intelligent parents, civilized countries spend more on education than on any other activities of life” (Ocho, 1997) (ed.). For Ali (2006:413), “Education is a structured and organized human development system or tool for inculcating knowledge, skills, attitudes and behaviour in someone with the intention of making himself actualized and socio-economically independent.” Nigeria in her wisdom, in pursuance of the inherent benefit thereof abinitio, had established a broad-based system of training and/or educating her citizens to empower them realize their full potentials and contribute to the socio-economic growth and development of the nation in general and lead a personally fulfilling life in particular (Okoro, 2015). The broad-based system of training established was primarily geared to the needs and interest of the children who are the future generations, to prepare and inculcate in them the right virtues that as they grow they will be in a position to acquire the expected kind of all round and quality education needed for the production of competent workforce for the nation, who would be relevant to the world of work and could function maximally to bring about the much desired development of the country.

Certainly, to buttress the aforesaid effort of Nigeria nation in terms of quality education provision for her citizenry, Fafunwa (2004) had succinctly articulated a few of the pre-colonial education goals in Nigeria to include among others;
1. To develop the child's latent physical skills;
2. To develop character;
3. To inculcate respect for elders and those in position of authority;
4. To develop intellectual skills: and
5. To acquire specific vocational training and to develop a healthy attitude towards honest labour.

From the foregoing it may be inferred that the intention then was very laudable, and it was to produce and have in place viable men and women who would become useful, competent and self-reliant to always address the needs of the nation in terms of man power supply as and when due. However, the outcome was far from what was expected. The then laudable primary objective of the education policy of the country was mid-way truncated and the nation was rather plunged into a state of motion without movement. What does that mean? The answer to that was not far-fetched. The product of the education system immediately began to ebb in quality in all ramifications. Evidently this scenario was attributable "to the British occupation which brought along with it utterly novel and revolutionary ideas in political, social, economic and religious organization as in technology and general world outlook” (Ocho, 1997) (ed.)

By and large, we shall, therefore recall that the downward trend in quality that the product of the nation's education system instantly began to experience was at the instance when the interaction between Nigeria and her erstwhile colonial administration was perfected in 1842, with the concomitant introduction of the western education type to mingle with her own system. Corroboratively, Obanya (2004), averred "that the colonial experience, in formalizing education, in a non-indigenous language and with a predominantly foreign orientation, created a hiatus between education and Africa’s
cultural roots”. This of course had an immeasurable impact on the people's psyche, and was responsible for orienting them towards the white man's employment as school education at the time was aimed at fitting the recipient into pre-determined service roles in the colonial system. This was in contrary to the tenets of the African education system. Rather, African education “seeks to prepare each person for his or her future role in the society. It inculcates too the skills needed for survival in the immediate environment and mobilizes all available human energies and talents for holistic societal development”. The inadequacies inherent of the inherited colonial system which include among others, lack of universal access, inappropriate orientation and content, in appropriate skill for nation building, have remained with education in Africa (Nigeria inclusive) and no reform effort has succeeded in domesticating and recontextualising the school in order to link it more closely with African cultural values (Obanya, 2004).

Nonetheless, the bequeathed western education type was in all ramifications lopsided, deficient and defective in its curriculum content which emphasized more on the theoretical knowledge at the expense of technical, vocational, science and technology education. This was a complete aberration in the entire African system, which invariably impinged on the already existing set standards for the training and/or educating of her citizenry. The association/interaction with the white man was a mismatch, and it marked the beginning of the nation's underdevelopment which manifested in many facets of her developmental endeavours, particularly in the field of science and technology education development. For Nigeria to build her economy on the basis of knowledge driven education, with more emphasis on the repositioning of teaching integrated science at the basic level must be given a serious priority attention it deserves with a proactive and unique strategic approach to enable her advance in the global educational frontiers. For Fafunwa (1972) in Okoro (2014), he alerted that “we are living in a world where science and technology have become an integral part of the world's culture and any country that over-looks this significant truism does so at its own peril”. It sounds ridiculous and more worrisome when, in spite of the colonial administration's presence in Nigeria with its purported development programmes in place, never considered it worthwhile that the country and her citizens be involved and participate in the prevailing global culture (i.e. in science and technology education) not until 1859 (seventeen years of its occupation) when the first secondary school (C.M.S Grammar School, Lagos) was established. Even at the time the first mention and teaching of science in any part of Nigerian schools was heard of, which incidentally coincided with the establishment of the C.M.S Grammar School, Lagos its teaching and learning remained a mere mirage because there was no seriousness whatsoever.

It was against this backdrop that Ikeobi (2010:2) vehemently posited that “it is unfortunate that of all the regions of the world with colonial past, Africa (Nigeria) has had the latest start into education in general and into the field of science, and technology in particular”. And that “it is not surprising to see that we are just novices or late-starters in the fields of science and technology”. Evidently it was in 1878, thirty-six years of the advent of formal western education in Nigeria that science was introduced into Nigeria Post-Primary institutions which provided courses up to ‘O’ level was ratified. Thus far it
has become more imperative now than ever before, for Nigerians to realize that the strength of any nation's economy is inextricably linked to the strength of its education system. And more so, to note that science and technology have been described as the primary drivers of progress of nations and have constituted veritable tools that make material and human development march forward (Okoro, 2013). Akpan (2008:11) had in like manner, quoted Brown and Sarenitz (1991) as saying that; Nations at the forefront of modern development, are those that have invested enormous resources over considerable time in three major areas which include; first establishment and nurturing of a stable, well-supported science and technology system, second in the promotion of mission oriented research in the basic sciences, coupled with a long-term strategy for technology development; and third, in the institution of a large scientifically and technology literate workforce.

Undoubtedly, Nigeria by all standards, and with her economic potential, resource endowment and its coastal location in the West African sub-region has all it takes to achieve an enduring potential growth, even in the face of the current recessed economy. Far from such expectations, Nigeria has realized very little of her potential because she is still a dependent economy. Such a scenario had continued for the fact that, a few of the Nigeria elite who were saddled with the responsibility to manage education matters in the country were inept, and had not divested themselves of the unavailing practice of using Europe as a model to develop Nigeria. It is pertinent to recall that an educated person is one who has made a systematic effort to recognize and come to terms with those problems, not only at the intellectual apprehension, but at the level of attitudes and actions. By implication, the problems of education are the problems of human life itself, which are in the relation of the individual and society, freedom and authority, continuity and change which invariably culminate in aspiration and frustration that are continually linked in human experience. Such a mix-up of aspiration and frustration in human experience had implicitly agitated and inspired the sentiment of Dr. Nnamdi Azikiwe who had come to term with the quality of education system in the country. Azikiwe, who unequivocally in 1934, when he returned from the United States of America, lamented that Africans had been mis-educated, and this had caused them to be unprogressive, stagnant, artificial, superficial and retrospective. He there and then called for mental emancipation and complete reeducation of the African (Nigerians inclusive) to enable them face the real needs of renascent Africa (Office of the Vice Chancellor, UNN, October 29-30, 2014).

Understandably, we cannot become what we need to be, by remaining the same thing we are. Thus at present some countries have advanced technologically due to their ability to maximize the application of science in their daily lives. Hence our ability to compete globally must begin each day in the classroom with the application of all available human and natural resources into all the facets of the country's developmental processes. It behoves the country to design education system patterned in consonance with the ideals, values and culture of Nigeria to guarantee the full realization of her true potential. Sequel to the aforesaid notion, the former Eastern Regional Government under the auspices of Rt. Hon. Dr. Nnamdi Zikiwe in quick response, adopted and adapted a

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radical approach to tackling the issue at stake, and thus looked inward to fashion an enduring education system for her people. Incidentally, the memo of the Eastern Regional Government on Education of 1963 as captured and articulated by Cookey-Gam (1980), cited in Okoro (2015) is being considered apt to help reposition the inherited chequered defective curriculum content of the West, and to rejuvenate the moribund state-of-the-art in the education system of the country thus:

Educational policy to be serviceable and viable must be geared to the special need and aims of a nation. We must now evolve a policy, a system which will produce men and women who will not be out of place in a technological age; a system which will feed our industries with personnel without starving our schools, colleges, the church, and offices of such personnel; a system which will inculcate in our youths due respect for the land. In short, a system which will produce useful, self-confident and competent citizens.

As matters arising, the 1963 Memorandum on Education of the Eastern Regional Government became an ember that has been fanned into flame, and which gave rise to the concept of the first ever convocation of “National Conference on Curriculum Development” by Nigerians in 1969. The memo was explicitly designed with the ideals, values and culture of the people of Nigeria in view, and adopted and adapted for the country as a necessary catalyst and a blueprint on education matters. Though as a novel idea, it is of Nigeria origin tinkered by Nigerian think tanks, and its adoption was very significant in the Nigerian context for solving of her peculiar educational challenges. Its vision was to bridge the gap in the socio-economic development that had been experienced in the country beginning from the grass root (basic) level which is underpinned by economic growth and the general well being of the citizenry.

Taiwo (1980) in Okoro and Chigbo (2001), argued that the 1969 Conference held in Lagos from 8th - 12th September entitled; “A philosophy for Nigeria Education” reviewed among other things; the obsolete goals of the imported education system with a view to re-designing a new set of goals which are tailored in tandem with the present needs and aspirations of the Nigeria society. To translate into action, the vision of the 1963 memo was co-opted into the communiqué of the 1969 National Curriculum Development Conference which in 1973 its document metamorphosed into what today is known as the National Policy on Education (NPE) for the country. This document “was first published in 1977 for use and was further subjected to periodic revisions in 1981, (1998, 2004, 2008, and 2013) in a form which articulates the country's plan to use education as an instrument for transforming Nigeria into a self-reliant and technologically developed nation” (Ohuche, Nzewi, and Nwachukwu, 1988) in (Okoro, 2014). The periodic revisions of the education system document have been necessitated by the need to ensure its adequacy in content and continuous relevance to new opportunities of the national needs and objectives.

The 6-3-3-4 system of education, an off shoot of the 1969 National Conference on Curriculum Development into which integrated science, a core specified Junior Secondary School (JSS) Subject was subsumed under came fully into operation in the country in September 1982. The two-tier Secondary School education structure of a
three-year Junior Secondary School (JSS) and a three-year Senior Secondary School (SSS) came and replaced the former five-year structure practiced in the country. The system, however, was adjudged apt for the country, poised to prepare her citizens and enable the country assume its desired vantage position in the modern development in the field of science and technology education. But to achieve these lofty objectives, is dependent on the successful implementation of the designed programme. Regrettably, prior to its full implementation, much fear had been expressed in many quarters against its implementation, and the laudable vision seemed to have lost when government resorted to series of policy somersault in the education sector. It is therefore on this premise that the paper is poised to examine the imperative of repositioning teaching of integrated science from access to quality in the basic level of the country's education system: a tool for self-reliance in a recessed economy. To highlight the philosophical reason for the introduction of integrated science into the country's education system. Some identified teething problems confronting teaching of integrated science at the basic level which include; inadequate number of qualified personnel, policy inconsistence, ineffective curricula delivery, etc was captured, and recommendations on the way forward were emphasized.

Repositioning Teaching Integrated Science from Access to Quality in the Basic Level of our Education System

First and foremost, to reposition, means to place in a different or new position. The underlying motive which has promoted the call to reposition teaching Integrated Science in the basic level of the education system of the country is to ensure quality and enhance efficiency and effectiveness of delivery in the system. Repositioning is never intended to distort the system but rather to improve upon for an optimum output. Jeffreys (1976) to buttress the aforesaid, quoted McLuhan, who has repeatedly pointed out, “that the content of each new environment is invariably the old environment itself for man drives into the future only with his eyes fixed firmly on the rearview widow. In the same vein, Eya (2016) succinctly argued that “it is erroneous to believe that we have done with the 6-3-3-4 system of education. Far from it, the 9-3-4 system is only emphasizing the existing implementation policy that has made access to formal education compulsory for every Nigerian child for the first 9 years of formal education”. It is merely semantics of the old wine in a new calabash.

Integrated science was designed to be the driving force of Nigeria's technological advancement in the education sector. The need to reposition teaching integrated science is now more compelling than ever before, for it is capable of revamping the prevailing recessed economy in the country if properly harnessed.

Basic Level of Education System

Basic level of education is very fundamental, obtainable in early childhood years and recognized as a human right that should be made accessible to all human being particularly to children of school age. It is a proviso which grants equal opportunities to all without discrimination. Nwabueze (1995) in Okoro (2015) argued
emphatically that basic education is fundamental to the strengthening of higher levels of education, scientific, technological literacy, capacity, and thus to self-reliant development, and as such should be in its right perspective. Its relevancy as supported by the Education Decree No. 16 of 1985 to nation-building and human empowerment include “character and moral training, the development of sound attitudes, the nurturing of sentiments of patriotism and other civic virtues” which cannot be over stressed.

It is pertinent, therefore, to recall that there is often a nexus between poor students “foundation and decline in teacher quality. The poor teacher quality stems from basic level of education because when the foundation is not strong, it is difficult to build upon. “It is a popular maxim that one does not give what he has not. That is to say, that the input into college of education comes from the secondary schools and those from the secondary schools are graduates from the basic level of education”. As a build up, if the basic level of education is well taken care of, properly funded and quality assurance is guaranteed, then by the time they move to secondary school they would build upon that. So, by the time they move to tertiary institutions, there is something already for them to build up from.

Access and Quality in the Basic Level of Education

Obanya (2004) vividly captured the two concepts “access and quality” to mean “more and better basic education”. Furthermore, he emphasized that more education means the provisions of more facilities, to enable the average primary school age child (a) “get admitted to a primary school at the school- starting age without difficult, (b) have access to primary school within working distance from the home”. It is an inclusive education programme where every category of school children is admitted without discrimination. On the hand, “the issue of better basic education relates to improved quality of the education that is offered”. The learner, of course, is the primary customer, and unless the learning style meets individual requirements it will not be possible for that institution to claim that it has achieved total quality (Singh and Sudarshan, 2010). Since it is the teacher who gives meaning to any education system, it behoves us to have balanced and well informed teachers at the basic level of education. Corroboratively Obanya (2004:63) opined, “to ensure that the custodians of the African child's formal basic education are better able to meet the needs of the child, there has to be improved emphasis on:
(i) raising the level of general education of primary teachers;
(ii) designing and implementing more appropriate and initial continuing teacher education programmes. When this is being implemented it will guarantee the availability of 'teachers who can 'localize' national curricula, by using them as a basis for school specific and learner-friendly activities”

Repositioning Teaching Integrated Science: A Tool for Self-Reliance in a Recessed Economy

Integrated science a derivative of the 6-3-3-4 system of education of the 1969 National Conference on Curriculum Development, is the most veritable launching pad, a
course of study designed and taught only at the Junior Secondary School (JSS) level of the two-tier system of secondary education to propel Nigeria into a greater accelerated progress in the scientific realms among other league of nations. Its essence is to have in place at the basic level, a strong and virile foundation in the education system what science is, and the concept of the fundamental unity of science. Science, though is not a magic wand, but with prudent application of its principles could help to reposition the economy to recover from its present state of doldrums. Integrated science however is not taught and/or treated incidentally as ancillary to the basic sciences. Rather its teaching has brought together the concept of the three basic sciences (physics, chemistry and biology) into a marvelous tapestry of subject, which is being introduced into the two-tier of secondary education as a seamless robe to guarantee the production of a desired workforce for the nation.

It is in view of this that the concept of the philosophy and objective of integrated science, which emphasizes the fundamental unity of science is being perceived, and that its introduction at JSS (basic) level would among other things as observed in STAN (1978:5) cited in Okoro and Chigbo (2001) “lay adequate foundation for subsequent specialist study” of the three discrete basic sciences at the SSS level. Furthermore, in the 3rd edition of the National policy on Education (1998:28), it is explicitly stipulated in section 5 No.39 that: “science and technology shall continue to be taught in integrated manner in the schools to promote, in the students, the appreciation of the practical application of basic ideas” in science and other related courses.

From matters arising, section 4 No.23 (b) and group A No.5 (p.20) of National Policy on Education (1998:19,20 and 22) pointed it out that “every student shall take all the seven (7) core subjects in group A....”, which stresses that a student should on the average offer “One of Biology, Chemistry, Physics or Integrated Science”; and most importantly any of the “students offering Integrated Science cannot offer any of Chemistry, Biology and Physics” at the same time at the Senior Secondary School level as discrete from Integrated Science. This arrangement was in tandem with the importance the nation has attached to the tenets of the Integrative Teaching and learning approach of science in schools. The commonality of the attribute of Integrated Science and other related science subjects as captured by UNESCO definition as cited in Okoro and Chigbo (2001) is “an approach to the teaching of science in which concepts and principles are presented so as to express the fundamental unity of scientific thought and avoid premature or undue stress on the distinctions between the various scientific fields”.

Nevertheless, its laudable objectives could not have attained to the full stage of implementation before it was abruptly punctuated. In the 4th edition of the National Policy on Education (2004), the inclusion of Integrated Science as plausible option of subject a student can offer in place of Biology, Chemistry and Physics at the Senior Secondary School was expunged from the list due to the policy somersault posture of the government. This singular scenario has a far reaching effect on the general economy of the nation. It is true because a nation in quest of progress and development must not
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cheat itself by deliberate neglect of any sector, for the fact that what affects a part does affect the whole.

The negative implicit effect of the cheat in the education sector has hampered the expected progress. Since the take off of the 6-3-3-4 system of education in 1982, and the concomitant teaching of Integrated Science the entire system has been embroiled in managerial ineptitude and controversies. Inadequate supply of qualified teachers, poor quality infrastructure supply and lack of funds are also challenges plaguing the teaching of integrated science.

Conclusion

Teaching of integrated science in the basic level of our education system, a course of study in which concepts and principles are presented so as to express the fundamental unity of scientific thought is very germane. It is an innovation, nascent in the system and one of the most recent integrative approaches adopted in the teaching and learning of the distinct science subjects in Nigerian schools. The idea was to inculcate in the learners (students) at the basic level a holistic, seamless transition of scientific knowledge of be basic sciences, and for the acquisition of sound scientific skills to prepare them to tackle some of the challenges ahead. To achieve these, roles of teachers are pivotal and indispensable. They give meaning to a nation’s education system, however scrupulous such a system may have been prepared. Hence, for any nation to attain its desired growth, development and progress it may aspire for, teachers’ welfare and training for competence must be properly taken care of and not to be cheated on. To cheat on the teachers is to cheat the entire education sector. For certain, what affects one affects all.

Recommendations

We recommend thus that, achieving self-reliance in a recessed economy; there is the need for the government and other stakeholders, to have a re-think of attitude on issues of national interest. Education, mother of all professions is being neglected and relegated to the background in the country. Stakeholders in the sector should have to restructure their thinking towards education matters for us to have a better Nigeria in the face of the present economic recession.

To this end, increased funding in the sector and taking proper care for the welfare of teachers would ensure enhanced service delivery and manpower development which invariably would have a long term implication on the entire economy of the country. Education should be made available and accessible to all categories of school age children, for the benefits are innumerable in terms of national development. A reassessment of the 3rd edition (1998) of the National Policy on Education with a view to producing science literate society and competent teachers enough to handle the aspect of the Education structure as in No.5, page 20 of the policy is being advocated for to guarantee quality in the system.
References


