

Science Education and Nigeria National Development Effort: The Missing Link

Igbaji Clement (Ph.D), Miswaru Bello (Ph.D) & Sadiyya Abdullahi Sunusi
Sa'adatu Rimi College of Education
clementigbaji@gmail.com, miswarubello@gmail.com

ABSTRACT

Science education which is the application of educational (learning) theories in the endless search for knowledge, resulting in the development of the cognitive, affective and psychomotor domains through some systematic processes involving careful observation, deduction and testing by empirical means is a sure tool for the promotion of development of any state. This is because the application of its knowledge will enable its beneficiaries to solve the ever occurring challenges of life in society. Due to this utilitarian nature of science education to national development, the Nigerian government has in principle emphasized its promotion in both its Constitution and National Policy on Education. In spite of this, its proper development in the country appears elusive due to the government underfunding of the entire education sector resulting in the non actualization of the its science education dreams in the country. In the light of the above, it is suggested among other things that priority attention should be given to science based education in the country's educational planning as well as following up such plans with genuine commitments at the level of implementation so that Nigeria like other countries can maximize the gains of a well planned, funded and executed science education programme for the stimulation of the country's development more so with a Vision 20:20.20 in focus. This is the part followed by the industrialized countries of the world.

Key words: Science Education, Missing Link, National Development.

Introduction

Traditionally science is seen as the systematic inquiry into the workings of nature with a view to understanding and directing these for human benefits. Buseri (1995:1) defined it as "knowledge acquired by careful observation, by deduction of the laws which govern changes and conditions and by testing these deductions by experiment"

Conant (1951) defined science as an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observations. In essence, science thrives on observation and experimentation which must permit continuity for success.

For Butts (1973:309) science involves any of the following three things namely;

- * All bodies of organized knowledge that developed systematic and consistent statements of tested beliefs.
- * The experimental method of discovering and refining of knowledge by relying on careful observation, the formulation of hypothesis, the elaboration of consequences, the testing and verifying of the hypothesis under controlled and measurable conditions; and
- * A general philosophy of world view according to which both natural phenomena and human events follow orderly regularities that can be observed by the senses, measured accurately and expressed in quantitative terms.

Adamu (2000) on his part sees science as a process involving various complex activities of man which result in producing universal statements leading to the explanation of observable behaviour of things that exist for which their characteristics can be predicted. It involves 'doings' and it is more concerned with various investigative processes and activities with regard to developing, acquiring and controlling knowledge, skills, capacity and attitude about the natural factors for the environment.

In sum, therefore, science -is a body of organized knowledge which has a humanistic and moral influence on society due to the possibilities it offers for the development and advancement of technology. As Fubara (1995:78) puts it the study of science and its application begets technology, which is the cornerstone of progress and the basis of maze development. Indeed (it is) the only guarantee and assurance got any nation to attain any reasonable level of self reliance and national security.

Technology which is a bye-product of science is, therefore, the application of scientific knowledge in solving practical problems confronting human society. Implicit in the above assertion is that, there can be no technology without science.

THE CONCEPT OF EDUCATION

Education like science has various definitions which appear to be directed towards the needs of the individual who defines it in the bid to make it relevant and be of purpose. Nevertheless, education has become synonymous in general terms with instruction or training by which people learn to develop and use their mental, moral and physical powers.

In educational parlance, mental is cognition, moral is affective and physical is psychomotor, and these lead to the achievement of happiness. It is now common knowledge that education has in most societies two principal roles: that of passing on /mow/edge from one generation to the next and that of providing people with skills that enable them to analyze, diagnose and thus question the status quo so as further the frontier of knowledge. Consequently it may be deduced that education is a process of learning aimed at equipping people with knowledge and skills that are adjudged useful to make the beneficiary become a functional member of the society.

Peters (1967) conceptualizes education as inseparable from the talk of what is worthwhile that has been transmitted in a morally unobjectionable manner. Going further, he said even though education does not point to a particular activity, certain activities would have a better chance of possessing the criteria of education. If so what are these criteria that Peters (1967) may have enunciated? The conditionalities for some activities to be referred to as education would include the fact that;

- * Education implies the transmission of what is worthwhile,
- * Education involves knowledge and understanding and cognitive perspective; and
- * Education utilizes processes which do not amount to coercion.

What the above implies is that the primary function of education is acquisition of knowledge. An essential value of knowledge is its capacity to explain and predict phenomena as well as its possibility for extrapolation.

WHAT IS SCIENCE EDUCATION?

Science education according to Buseri (1995:11) is the application of educational (learning) theories especially those based on the philosophical, sociological and psychological perspectives in the endless search for knowledge, resulting in the development of the cognitive, affective and

psychomotor domains through some systematic processes involving careful observation, deduction and testing by empirical means. And for the purpose of teaching, Buseri (1995;11) opined that, it is

The process whereby persons (teachers inclusive) are prepared or equipped with knowledge and skills to help ensure the effective dissemination and inculcation of scientific concepts, culture and thinking process and activities through generally accepted pedagogical strategies and tactics, based on the application of learning (teaching) and educational theories.

Science education is thus more than the presentation or acquisition of scientific facts and skills. It includes the development of new ways of thinking, reacting and behaving - a development that reveals itself in increased skills, knowledge and thinking capacities to tackle problems of life, in new habits of action, in more desirable attitudes, in benefited personality and in improved character, - albeit by some controlled or regulated and thus systematized process. This form of education Buseri (2003) continued is exercised and acquired both informally and formally in schools. According to OGkafors (2004:80) in pedagogical literature, the main purpose of science education is to promote scientific and technological literacy which is to help individuals;

- * Develop the ability to use scientific knowledge creatively in everyday life,
- * Be familiar with some processes of science that are very useful in decision making and problem solving,
- * Explain personal feelings in a constructive manner,
- * Understand scientific issues involved in handling household technological devices,
- * Make appropriate decisions that are related to health, Nutrition, environment, education and lifestyles,
- * Develop sensitivity to, and respect for the feelings of other people
- * Categorize the observable and unobservable universe into manageable units for study and ultimately providing reasonable explanations for observed and unobserved relationships among others.
- * Prepare learners in the several disciplines of science
- * Provide the background required of individuals entering technological occupations or professions such as electronics medicine, engineering among others; and
- * Providing background in science as part of the general education of the individual for effective citizenship.

These no doubt are vital tools for national development of any country including Nigeria.

Due to its utilitarian value to national development, every effort should, therefore, be made to promote its development by any state that wants development. Nigeria as a state yearning for development can, therefore, not shy away from it in its developmental agenda. What then is national development that science education is to stimulate?

CONCEPT OF NATIONAL DEVELOPMENT

National Development is an aspect of the general development process. As a concept, development is the desire and ability to use what is available to continuously improve the quality of life and liberate people from the vicious circle of poverty. It is also synonymous with self-reliance which requires the ability to learn how to improve one's well-being without recourse to others. It involves the ability to act and apply knowledge, the ability to use underlying activities to improve the knowledge of the process of development and of knowledge itself.

Every state in the world according to Paulley (2011) is in the race for development as it is the

basis by which states in the world are classified either as first, second or third world/ developing countries. Countries that have achieved a certain degree of success in the direction of development are referred to as developed while the others on the other side of the divide are either tagged underdeveloped or developing countries otherwise called the third world countries. This is where Nigeria comes in.

National development which is an aspect of the whole process of development conceptually covers on the other hand a wide range of positive and progressive changes in human activities and endeavours in the life of a people. As a concept, Ezewu (1991:3-4) sees it as “...the level of efficiency attained by a nation through the performance. __of her social institutions”.

Nduka (2006:14) on his part conceptualized national development from a nationalist’s perspective when he said, it is

The totality of the concerted efforts made by individual societies (nations) to overcome weaknesses by acquiring increasing control over the forces of nature thereby progressively eliminating the centuries’ old scourge of poverty, ignorance and disease and making life on earth more worth living.

For Okorosaye-Orubite (2005:3), national development means “stages through which a nation (state) passes while taking a positive march towards quantitative and qualitative self-actualization by harnessing its human and material potentialities and using same to their maximum capabilities.” The issue of harnessing the human potentialities in the above assertion is of paramount importance to us in this paper because education (here science education) is a major tool in this process where a teacher holds sway. Efemini (2002:5-6), on his part sees national development as not just an increase in quantity but a qualitative transformation of people’s living conditions.

National development to Mezieobi (1994:14) is a process of systematic transformation of the overall social, economic, political, scientific and technological life of a nation via effective, coherent, co-ordinate management system, result-oriented social mobilization strategy in which the citizens actually participate and exhibit positive attitudinal commitment in the overall reconstructional process for the improved human conditions of the people.

From the above, it implies that national development is symbolized by the presence of sustainable high literacy rate, qualitative and functional education, availability and provision of adequate medical facilities, food, housing, cultural perpetuation, respect for social justice and the laws of the land, commendable social behaviour, socio-political integration, cohesion and cooperativeness, political stability characterized by democratic reasonableness, rational mass political participation and representation, sensitivity to the yearnings and sufferings of the people, political efficiency, improved standard of living of the populace as well as a healthy and stable economy. Some of these indices In the Nigerian context, most of these indices are lacking thereby frustrating the national development effort of the country.

In spite of the many indicators outlined above, Ifemeje (1985:47) is of the view that “practical national development efforts could not be divorced from attitudinal development or worthy attitudes of the individuals that make up the state This is so because; it is the worthy attitudes of the people that will make for the sane utilization of the material indices of development. This bit was reaffirmed by Ugwu (2007:261) when he argued that “the cardinal or focal points of national development are the individual and positive societal changes, adding that a nation cannot be said to have developed when a significant percentage of her population live without quality education, good shelter, good food and worse still with their potentials not fully tapped and

channeled towards fruitful enjoyment,” To effect this attitudinal change in the people, the teacher as the hub of the formal educative process becomes a sine-qua-non. However, for the teacher to achieve this effectively for the development of the society, he ought to be subjected to a formal process of preparation which is referred to as teacher education.

Paulley (2010:3 17) defined teacher education as all types of formal instructions and professional preparation given to the teacher with the aim of preparing him for the teaching profession leading to the acquisition of a certificate, diploma or degree of a tertiary institution such as a college of education monotechnic, polytechnic or a university as a professional teacher.

THE ROLE OF SCIENCE EDUCATION IN NATIONAL DEVELOPMENT

The Nigerian government like all other governments in the world realizes the role of science and its by-product-technology in issues of national development. It is for this reason that their promotion is enshrined in section 18(2) of the 1999 Constitution of the Federal Republic of Nigeria.

The goals of science education in Nigeria according to the National Policy on Education (FRN;2004:29) are to

- * Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy;
- * Produce scientists for national development,
- * Service studies in technology and the cause of technological development;
- * Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

Ataga (1997:11) in discussing the role of science in the development of a nation argued that Science..... gives man the power to foresee and judge the consequences of his own actions in reflection to the natural world in which he is. It is a social activity that serves human needs for it is a foundation for technology since it provides knowledge and technology provides a way of using this knowledge.

Iheoma (1983:15) in a similar vein while eulogizing the role of science in the development of a nation concluded that “.....science (had) laid the foundation for modern technology which has enabled modern man to achieve an unprecedented control of his environment and to enjoy a high standard of living unknown to his ancestors”.

Pandit Nehru, the Prime Minister of India from 1946 to 1964, a natural science graduate of Cambridge University, who is widely respected and credited as the architect of modern India due to the solid foundation he laid, in emphasizing the role of science in the developmental agenda of a country, according to Fubara (1998:89), said;

It is sciences alone that can solve the problem of hunger and poverty, insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people. Who could afford to ignore science today? At every turn we have to seek its aid. The future belongs to science and those who make friend with science.

This assertion of Nehru in the thinking of Fubara (1998:89) is another way of re-echoing the order God Himself, the Master Scientist, gave when He decreed:

Be fruitful and multiply and fill the earth and subdue it (using all its vast resources in the service of God and man) and have dominion over the fish of the sea, the birds of the air and over every living creature that moves upon the earth (Genesis 1:28).

Science, therefore, is the foundation of man’s knowledge of life and the universe. It is only

through science which begets technology according to Fubara (1998:89) can mankind obey this order of God and fulfill God's ordinance for sustainable development of the earth, the environment of mankind. It is the adoption of science in the national life that makes the difference between the developed and the underdeveloped countries of the world as noted above. In essence the main cause of the competitive gap between Nigeria and the developed countries of the world is the creation and application of scientific knowledge. The rule of the competition today is dependent much more on the natural capabilities to exploit resources, rather than just gloat over possessing them. This, according to Ekpiwhre (2008) is exemplified in the fact that many of the industrialized countries of the world today are poorly endowed with natural resources and less.friendly weather conditions. Yet they have attained leadership in the world economy, essentially through the effective application of scientific knowledge got from science education. Ironically, the least developed countries are those with favourable climatic endowments but due to less genuine emphasis on the development of science education, such countries have found themselves in the backwaters.

Years back, India was a key member of the club of backward economies, but today the story has changed. India's transformation did not happen by accident, rather it is the result of that country's leadership vision on science education as a gateway to the development of its human capital. India is doing very well in the medical field as well all due to the country's leadership genuine commitment to science education. It is a known fact that currently India is one of the leading countries in the Information and Technology (IT) revolution flagged off in the 1990s.

Countries like the United Kingdom and France benefited immensely from the Industrial Revolution of the 19th century due to their commitment to science education in their school curriculum. The USA emerged from an agrarian economy into an industrial superpower in the 20th century through the effective application of science education. In all these countries, heavy investment was made on their human resources and factories and their successes were based on carefully designed scientific plans and strategies. These are lacking in the Nigerian case as it is common with most African states.

A country's innovative capacity, that is, the ability to create and/or apply new knowledge to solve practical problems according to Ekpiwhre (2008) greatly depends on four indices namely

- * The country's level of technological capability;
- * The formal and informal institutions, as well their supporting systems;
- * Physical infrastructure; and
- * An advanced knowledge infrastructure.

Using the above criteria, Ekpiwhre (2008) asserted that, Nigeria stands at the 71st position out of 75 countries in a rigorous assessment conducted in 2008 by a Nigerian, Professor Banji Oyelaran-Gyeinka, who heads the UN-HABITAT in Nairobi - Kenya. The message is clear - Nigeria has a long way to go. Surpassing 70 countries among who are South Africa, China, Israel, and Malaysia among others is no mean feat. Nigeria cannot afford to stagnate while other countries are making steady progress.

This is so because countries with genuine interest in the development of science education have benefited immensely in wiping away most of such countries' superstitious beliefs through the application of the knowledge of science (technology) to live a satisfactory economic life. This is in addition to assisting such countries to raise the level of their socio-cultural life through the manufacture of modern devices that have equally made their lives much more comfortable in recent times which implies national development. In other words, science education has

contributed to human knowledge through the production and use of tools in order to solve real life challenges. For Nigeria to exploit the blessings of science for its developmental agenda, the purveyors are trained human resources in scientific skills who can apply the ‘knowledge gained in solving practical problems. It is through the growth of such a large scientific and technological manpower base that the needed development of the country can be assured. This is so because it is such manpower that will guarantee the efficient utilization of the abundant natural resources that will stimulate national development in a given country. Here lies the missing link with reference to Nigeria in her developmental strides using science as a base. The reason for this is because science education in Nigerian schools has dwindling fortunes over the years on account of poor funding of the entire education sector resulting in the many lacks such as poorly equipped laboratories, ill-prepared teachers, absence of internet facilities among others even though government in principle has placed a strong emphasis on the study of science in the country’s school system.

For instance, in view of the positive role of science and its bye-product technology in a country’s national development effort, successive Nigerian governments have made remarkable efforts to inculcate in the citizenry the culture of science and technology, These efforts according to Ekpo (200739) are reflected in the following areas namely

- * Establishment of Nigerian Colleges of Art and Science
- * Establishment of colleges of technology
- * Establishment of special science primary and secondary schools
- * Establishment of federal/ state technical colleges
- * Payment of special allowance for science teachers in secondary schools
- * Establishment of technical colleges of education; and
- * Establishment of universities of science and technology.

The National Policy on Education (FRN: 200438) on its part while emphasizing the place of science and technology for the country’s developmental agenda states that “a greater proportion of expenditure on... education shall be devoted to science and technology”. Accordingly, the National Policy on Education (FRN: 2004:29) went on to assert that special provisions and incentives shall be made for the study of the sciences at each level of the national education system. For this purpose, the functions of all agencies involved in his promotion of the study of science shall be adequately supported by government and that:

Government shall popularize the study of the sciences and the production of adequate number of scientists to inspire and support national development.

As a way of putting the above intentions of the Nigerian government into reality, the National Policy on Education (FRN: 200439) states unequivocally that “not less than 60 percent of places shall be allocated to science and science oriented courses in the conventional universities and not less than 80 percent in the universities of technology? The reason for this is to launch Nigeria into the technological age so as to stimulate the development of the country through the exploitation of her natural resources with the help of knowledge got from science education.

THE MISSING LINK

According to the National Policy on Education (ERN: 2004:21), the science component of the Senior Secondary School core subjects include Physics, Chemistry Biology, Agricultural Science and Mathematics. These will enable a student to offer science related courses at the tertiary level. Most secondary schools in the country more especially the ones in the rural areas do not

adequately prepare students for the level expected of the students by either the West African Examinations Council (WAEC) or the National Examination Council (NEC O) of Nigeria in the Senior Secondary Certificate Examinations (SSCE). This is due to the fact that most students do not see even the commonest science equipment (beaker) as these equipments are usually borrowed from schools in the urban centres only during external examinations. Accordingly most students from the rural areas are usually assisted by their teachers to operate these equipments during the examinations as a way of ensuring that they pass the practical examination which is a condition to pass the science examinations. The implication is that such students will only pass without knowing the how of the affected subject.

Paulley (2009:236), Kpolovie and Obilor (2013:281) had submitted that the Nigerian government budgetary allocation to the education sector from independence in 1960 to time of writing that is 2014 revolves within the range of 0.88% to 17.59% as against the benchmark of 26% proposed by UNESCO to developing countries of the world of which Nigeria is one. It was 0.88% in 1973 being the lowest and 17.59% in 1997 as the highest so far at the national level. At the states level, the trend is similar, For instance, Bayelsa State which declared a state of emergency on education under the administration of Governor Seriake Dickson in 2012 allocated only 9.23% of its annual budget to education. As if this was too much, only 3.5% was actually released to the sector that year (Bayelsa state of Nigeria strategic education sector plan: 2013-2022: November: (2013:37). This, indeed, is a serious state of underfunding. Even at this, much of what came to the sector was spent on recurrent expenditure such as salaries and overheads. The Bayelsa State example is a sample of what goes on in virtually all states of the federation. The effect of the above scenario on the development of science education in Nigerian schools is the absence of such enablers as science equipments, reagents, specimens, chemicals and laboratories among others for the effective teaching and learning of the sciences in the schools leading to the production of good future scientists for the promotion of development in the country.

This is because very few students do apply on their own to be science educators in the country's teacher preparation centres as they are poorly prepared in their primary and secondary schools. For instance in the Niger Delta University Wilberforce Island, Bayelsa State during the 2011/2012 academic year, none applied on their own to read either Biology, Physics or Chemistry Education. In fact the university had to conscript students, into these areas in view of their positive

Role in national development. The implications of the above scenario are grave. First of all, both the primary and secondary school system, the supposed beneficiaries of the products of the faculties of education in either the universities or colleges of education are themselves in crises and so are inefficient as they will not have the needed science teachers to implement the science education component of the school curriculum. By and large, the secondary science education component in Nigeria, being the gate way for scientific preparation for national development can be said to be producing a crop of scientifically illiterate citizens who can at best only read and memorize science to pass examination but cannot do science. This is inimical to national development, the reason being that students who have such brilliant certificates under such conditions cannot contribute meaningfully in the national development agenda of the Nigerian state.

What are needed by the Nigerian society for its developmental agenda using scientific knowledge is the doing and not the reading and memorizing the sciences. The implication of the above is that as these ill prepared students are emptied unto the universities for courses related to

science and technology, the result becomes the production of ‘scientific historians’.

The utility of knowledge acquired in school, particularly in the sciences should be that of application to tackle the challenges facing society and not to express one’s ignorance, This is the position of Shymansky and Kyle as cited by Koseman (2000:144) when they opined that

The true manifestation of successful schooling is not how well students perform in school assessments. How citizens think, what they value, how analytical and critical they can be, how they question and reflect are among the true measures of successful schooling. The most valid measures of the effectiveness of today’s school science experience might not be available for 20 or more years.

The Nigerian government in principle attaches so much importance to science and technology in the country’s developmental agenda hence the much emphasis on policy statements in these areas. The challenge, however, is that of marching action with intention which is the missing link as shown in this paper. This being the case, what is the way forward? The Way Forward

The technological development of any state including Nigeria revolves around science education. This means that the quality of education provided through science to the people will to a large extent determine the quality of development the country will experience. As a country We must buy into the vision of science education. The way out, therefore, is to pay genuine attention to the development of key areas that determine the country’s natural capability for science and technology driven growth. This, in our opinion, is to give priority to science based education in the country’s educational planning and following up such plans with genuine commitments at the level of implementation. This is the part followed by the industrialized countries of the world.

In addition to the above, for Nigeria to harness the blessings of science education for its national development as a country, the following are suggested as ways forward.

- * Proper training of science teachers should be encouraged. This must go beyond the normal classroom teaching with much emphasis on the practicalization of the learnt scientific concepts. This is because it is at this point that the knowledge of science will have a surrender value on the country in its developmental match. What this means is that the government must have the strong political will to provide all that is needed to actualize this which implies adequate funding of the education sector as the engine room of development.
- * Such trained teachers should be adequately motivated by way improved conditions of service including payment of science allowances to make them feel committed to the job of service delivery.
- * The provision of teaching materials such as equipment, laboratories, textbooks, among other enablers of the effective teaching and learning of science education should be given top priority in the funding of education in the country since science education is the pivot on which the development of the country is hinged upon.
- * Due to the significant role of science and technology in stimulating the development of a state, emphasis should be placed on their development as they are provided in the National Policy on Education (2004) more so with a Vision 2020 in focus. But in doing this, the mistake of stereo typing students into science oriented or art oriented categorization for the sake of it as determined by the school authorities should be avoided. Instead, the natural endowments of the individual as shown by achievement in open competitive examinations and other assessment mechanisms should be the basis for the streaming of learners into science oriented programmes. This way, the much wastage

in the school system may be avoided due to conscription of candidates to the field that learners have little or no aptitude for. It is only by this means that the country can assess the blessings of science and technology for its development.

- * Greater recognition should be given to the promotion of technical skills among those learning the sciences in the country's educational institutions.

In other words, our educational system must be equipped with the capability to produce personnel with skills for running a knowledge based economy. Such skills must include ICT, team building, communicative skills, that is, ability to transmit what is known to others among others.

- * Incentives such as payment of bursary and award of scholarship among others should be provided for people genuinely interested in studying sciences in both the secondary schools as the feeders of the tertiary institutions for the production of the manpower needed for the country's development.

REFERENCES

- Adamu, B. (2000). Enriching science, technology and mathematics education. Problems and prospects. In Science Teachers Association of Nigeria (STAN) 41st annual conference proceedings. Ibadan: Heinemann Education Book Plc.
- Ataga, AO (1997). A comparative study of performance in science between Federal Government Colleges and Demonstration Secondary Schools in Rivers State: Unpublished M.Ed Thesis: Uniport
- Bayelsa State of Nigeria (2012). Strategic education sector plan (SESP): 2013- 2022. Yenagoa: Ministry of Education.
- Buseri, J.C (1995). Principles of science education and teaching. Port-Harcourt: Bucil Limited.
- Buseri, J.C (2003). Science and technical education. In S.B Nwindeeduh (Ed) trends and issues in managing universities in Nigeria. Owerri: Springfield Publishers Ltd.
- Butts, R.D (1973). The education of the west: a formative chapter in the history of civilization. New York; McGraw Hill Books Company.
- Conant, J. B (1951). Science and common sense. Yale: Yale University Press.
- Efemini, A.D (2002). Ake on the meaning of development. In A.D Efemini (Ed) Ake and African development: Selected issues. Port Harcourt: Paragraphics.
- Ekpiwhre, G (2008). Utilizing science and technology to drive Vision 2020. In Punch Newspaper: Monday 18 August.
- Ezewu, E.E (1991). Nigerian intellectual culture and national development. University of Port Harcourt inaugural lecture series. No. 1 0
- Federal Republic of Nigeria (FRN: 1999). The constitution of the Federal Republic of Nigeria . Abuja; Federal Ministry of Information.
- FRN (2004). National policy on education. Lagos: NERDC Press.
- Fubura, D.M.J (1998). Education role and policy priorities for Rivers State and oil mineral areas development. In N.E. Dienye (Ed) Educational and national development in Nigeria. Ugheli: Eddy-Joe Publishers Nigeria.
- Ifemeje, CC (1985). Teaching social studies for national development & integration, In OS Gkobia & E.N.E Udoh (Eds). Social studies is national development & integration. Nsukka : A publication of SOSAN & Institute of Education, University of Nigeria. Nsukka.

- Iheoma, E.O (1983). Education and national development. In journal of education in developing area (JEDA) 11.
- Kosemani, TM (2000). Scientific literacy and the Nigerian society. In J.M. Kosemani (Ed). Nigerian education: matters arising, Volume 1. Port Harcourt: Abe Publishers.
- Kpolovie, FJ & Gbilor, I_E (2013). Education funding in Nigeria: Adequacy. Inadequacy? In journal of education in developing areas (JEDA) 21(1) march. A journal of the faculty of education, university of port Harcourt, pp 276-294.
- Meyer, J (2006). The every life Holy Bible. Ney York. Warner faith Hachette books group.
- Mezieobi, K.A (1994). Achieving national development via the instrumentality of distance education in social studies: myth or reality? In Amadu bello university (ABU) journal for distance education. 2(1), pp 131-121.
- Nduka, O (2006). The roots of African underdevelopment and other essays. Ibadan: spectrum books ltd.
- Okafor, N. (2004). Science education for national development and self reliance in a deregulated economy. Journal of the Nigerian academy of education (NAE) 1 (2) November, pp 76-87.
- Okorosaye- orubite, A.K (2005). Modern education and national development. The Nigerian experience. In journal of educational research & development in African (JERDA), 3 (1).
- Paulley, F.G (2009). The role of education in the realization of the MDGs in Nigeria. In African journal of historical sciences in education. 5(1&2), pp230-242.
- Paulley, F.G (2010). Teacher education and national development in Nigeria 1842-2009. Unpublished Ph.d thesis, faculty of education, university of port Harcourt, choba.
- paulley, F.G (2011). Factors that make teacher education programme qualitative for development in Britain and the united states of America: lesson in Nigeria in the 21st century. Journal of sociology and education in Africa 10(2) june, pp 1-28.
- Peters, R.S. (1967). The concept of education. London: routledge and kegan paul.
- Ugwu, E.U (2007). Nomadic education as a tool for national development. In B.G Nworgu (Ed). Optimization of service delivery in the education sector: issues & strategies. Nsukka: university trust publishers, pp 258-263.