

Original Article

BUILDING NATIONAL CAPACITY THROUGH SCIENTIFIC INFRASTRUCTURE: IMPLICATIONS FOR GROWTH AND SECURITY IN NIGERIA

Emmanuel Terhemba Agbo

Department of Physics, College of
Education, Oju, Benue State, Nigeria
DOI: <https://doi.org/10.5281/zenodo.17132636>

Abstract: The declining standard of education in Nigeria has reached a critical point, raising serious concerns about its relevance and impact on both individual development and national progress. Despite significant investment by parents, the government, and stakeholders, the quality of education received by Nigerian children is increasingly perceived as inadequate—failing to equip them with the skills for a fulfilling life or contribute meaningfully to national growth. This paper explores the pivotal role of security in the development of any society and specifically examines its connection with education and national development in the Nigerian context.

Focusing on physics education as a case study in science education, the paper highlights how national security and educational advancement are interlinked. It investigates major causes of Nigeria's security challenges, such as corruption, poverty, unemployment, decayed infrastructure, environmental degradation, poor healthcare, and socio-religious conflicts. These issues are shown to contribute to broader development crises, including youth restiveness, low foreign investment, diversion of public funds, and the psychological instability of citizens.

The study underscores that a lack of functional and relevant education, particularly in the sciences, exacerbates insecurity and underdevelopment. It also reflects on the Federal Republic of Nigeria's goals for science education and the systemic weaknesses in achieving them. The teacher is identified as central to the educational reform process, as the success of all educational outcomes revolves around the quality of teacher education and preparedness.

The paper concludes with a series of recommendations aimed at aligning science education—especially physics—with the realities of the 21st century. It calls for urgent reforms in curriculum content, teacher training, infrastructure, and educational policy to foster a secure and development-oriented society.

Keywords: Scientific Infrastructure, National Security, National Development

Introduction

The knowledge of science is crucial for effective living in this modern age. Given its application in industry and many other professions, it is necessary that every student is given an opportunity to acquire some of its concepts, principles and skills. Unfortunately, the teaching and learning of science has been fraught with challenges which prevent many students from performing well in external examinations. The philosophy, objectives and concepts of physics curriculum have been adjudged by professionals in the field to be satisfactory; but its implementation has fallen short of expectation because of lack of sufficient number of qualified teachers, inadequate equipment to ensure the performance of related-students activities which are aimed at enhancing meaningful learning.

Original Article

There are shouts of falling standards of education in Nigeria generally. The school products are no longer making a living in the society in which they live. Also, the quality of education the children receives in school does not endow them with the means to lead more satisfying life and enjoy the humanistic aspect of education as an end in itself. Employers of labour, parents and indeed the general Nigeria public now tend to wonder whether the schooling system in which they have made huge investments is still making dividend. They tend to wonder whether the system has lost its focus.

The Concept of National Security

The term “security” may be looked at as a state of being protected from danger or anxiety. For a nation, security connotes conditions of peace, stability, order and progress. National security has been construed in different ways, each of which emphasized vital factors underlying ideals. Brennan (1961) holds that national security is the protection of national survival; national security is to be understood in terms of the desire and capacity for selfdefence. Ochoche (1998) holds that national security focuses on the amassment of military armament, personnel and expenditure. All the above definition sees National security has changed overtime. It was expanded to include international economics, long term goals of national development and reconciliation. They are very important for the security of any nation. With this approach, Asad (2007) says “that national security cannot be narrowed down to exclusively military term. Socio economic and cultural aspects, problems of development and modernization, and national integration should be deemed important in considering”. Okoli, (2007) suggested that national security is more than territorial defence and should focus on the “Physical, social and psychological equality of life of a society and its members both in the domestic setting and within the large regional and global system”. According to Asad, (2017), Global development now suggests the need for another analogous broadening definition of national security to include resources, environmental and demographic issues. National security question involves a lot of issues. It practically touches on all spheres of human existence. The best way to approach it is from the systems theory perspective where a dislocation in any particular area of the system is bound to have an overlapping effect on other areas. It ranges from food security to issues of environmental degradation. It touches on health matters. It encompasses psychological security as well as arms security. A number of factors may expose a nation to danger. To that extent, national security may also be viewed as a multidimensional process whose purpose is to safeguard national values. The most fundamental values of any nation is its survival, self-preservation, and self-perpetuation. A nation that is capable of protecting herself from harm equally enjoys immense capacity for enviable development. We may therefore posit that national security and national development are complementary and inseparable phenomena. They are mutually related. There can be security without real development and no development without security. It is vice-versa.

The Concept of National Development

Scholars have variously perceived the subject of development. Asad, (2017) defined it from the perspective of institutional framework especially of those created by Western ideologies. Others perceived it as a one-dimensional process and to that extent encouraged the pursuit of economic programmes that seem to compete with western industrialized countries in the level of economic attainment. At other times, we observe countries merely importing political system that are successful in western environment without reference to the requisite civil culture necessary to sustain them. An example is the British Westminster system and the American Presidential system of government that Nigeria borrowed. These perspectives see the western countries as models for development. Development is more than the provision of physical infrastructure. Ebeh, (2015) was of the opinion that “development is realistically seen as a multi-dimensional process involving the totality of man in his political, economic, psychological and social realities among others”. Development is a holistic phenomenon not a concept to be abridged in application or compartmentalized and approached as a uni-dimensional process. Essentially it should be man-oriented and not institutional-oriented. If we focus our attention on the individual citizens we can then think of what he needs at a particular time and how he can combat a number of colonial legacies which have held him down. Development, more importantly must be conceived in the context of a

Original Article

particular social system. In other words, it is wrong and indeed injurious to conceive of development in terms of system or system suited for a different cultural milieu. When we talk about national development we are concerned about quality improvement in the various sectors of our national life such as the political, ethical, socio-psychological, and economic spheres of national existence, which combined, to define and assure quality and productive existence for the citizens of a country. It is the accelerated economic, administrative, social, political, cultural and industrial changes in a condition considered desirable to achieve the progress of civilization.

The Nexus between National Development and National Security

National development and national security are two sides of the same coin. According to Ebeh (2015), over the year, the security of the Nigerian nation state was reduced to that of the ruler and his immediate supporters. The country's leaders rules due to their ill-conceived notions of security. The security calculus of Nigeria State failed because it did not include vital aspect of social and national development, such as the provision of basic social amenities. Thus, the Nigerian State could not meet the social, economic, or even the military conditions for national security. These problems are clear indication that the government failed to consistently maintain the core social values and physical infrastructure necessary for establishing and sustaining national security, national survival and socio-political wellbeing of the nation. Ezeife (2006) asserts the above fact when he says that the increasing national decay and insecurity is seen in the regressing economy, unable health services and facilities, lack of good water, transportation and fuel problems, unemployment and other problems that have overwhelmed the Nigeria society. From the above we can see that security is anchored on national development. On the other hand, development can be anchored on security. For instance, the case of violence like ethnic crises, vandalism of pipes and electrical poles, armed robberies, kidnapping and others that cannot be mentioned, have hindered development of some infrastructures and foreign investment. Therefore, we can say that they two cannot be detached.

Factors that Undermine National Insecurity

According to Ebeh (2015), two major factors easily undermine the security of any nation. They are injustice and corruption. These elements may manifest outright in the actions or inaction of the government (i.e. the executive, the legislature and the judiciary) in their relationship with the governed and they have great capacity to generate devastating ripple effects. Let us examine some cases before looking at other element.

Injustice:

Injustice in the area of resource allocation and environmental degradation has led to violent eruption, particularly in the Niger Delta. From Warri in Delta State to Akwa Ibom State there have been clashes Rivers State is not spared either. In Rivers State, peace has taken the back seat as menacing youths wielding AK 47 rifles, hand grenades and other sophisticated weapon sack the police at will and raid communities. Revelations from the judiciary have not helped matters either. Contemporary judiciary history of Nigeria bristles with unethical, artful and dishonest practices which in most cases, have given rise to or exacerbated insecurity in the land. The former takes the form of flagrant breaches of justice such as when a judge grants *ex parte* injunctions to defeat justice. The latter includes a situation in which a court volitionally delays the trial of a criminal case until all the relevant snippets of evidence concerning that case have been lost sight of. Such as the continued trial of the former Chief of Army staff, Gen. Ishaya Bamaïyi, Hamza Al-mustapha, and Barnabas Jabil, in connection with the murder of Alex Ibru, publisher of the Guardian. The trial of these criminal cases started in 1999. Sometimes some of such trials linger on until some or almost the entire accused, defence, and /or prosecution witnesses die in detention. Frustrations (Ebeh, 2015).

Corruption:

Corruption is perceived as dishonest or illegal behaviour especially of people in authority.

Ikejiani (1995) views corruptions as "the inducement of means of improper considerations to commit a violation of duty, an inducement in cash or kind to secure services or good from public official or agencies through illegitimate or unlawful or irregular means". Where there is corruption in the land, there is bound to be insecurity.

Original Article

When society begins to honour and recognize people who became rich through dubious and questionable means as Nigeria had done in the past decades, we send signals that crime pays rich divided. This discourages hard work and honesty and encourages others to take crime as a way of life. The Nigerian value system has deteriorated so remarkably that we now celebrate corruption. A fraudster is more likely to be rewarded with a traditional title than a hardworking member of the community. In the political sphere, you confront situations where candidates who spent their resources to contest the party primaries and won are eventually replaced by other names favourable to the governors or the party hierarchy. Corruption is a happy bed-mate with injustice. In point of fact corruption provided the fuel for injustice and where two meet, the resultant effect is crisis. Crisis is coronary to insecurity such as insecurity of life, insecurity of property, insecurity of morals and ethics. Apart from injustice and corruption other areas that galvanize a state of insecurity in Nigeria include;

Poverty:

Poverty may be in such intangible area as knowledge or ideas. It may also be in the area of lack of basic necessities of life such as food shelter, clothing and good health care, a hungry man, an adage says, is an angry man. An angry man may not be in the habit of exhibiting a sense of poverty that is affecting security is high rate of unemployment in Nigeria. It is responsible for robbery, fraud (419), trafficking, and other crimes that are threatening our national security

Health Issues:

Health care is also important in the equation of national security Asad (2017) says there is a link between global health and human security. One quarter of deaths in the world is due to infectious diseases. The impact of HIV/AIDS on national security and development is also enormous. It creates political and social tension, stunts economic and human development, and reduces the effectiveness of the military. A nation that is dominated by the sick or hungry majority is already an incapacitated nation. Food security, health security and even education security are therefore aspects of national security.

Religious Issues:

Religious has been described by Karl Marx as the “Opium of the masses”. Doctrines that are at variance with the principles of nationhood are likely to be a source of insecurity to the nation. Religion is the powerful instrument for good and for evil. This power of religion was the principal reason for tussle between church and state in England in the 15th and 16th centuries. A lot of crisis experienced in this country have traces of religious undertone. Examples include, the Maitasine riots, the uproar that greeted Nigeria’s admission as the 46th member of the Organization of Islamic Conference (OIC). Religious issues of this nature tend to constitute security issues to a nation.

Infrastructure Deficit:

The evidence of the dismal state of national security can also be in what Onyegbula (2000) described as the diminishing standard of living and the deterioration of social infrastructure and educational system. For instance, the roads, electricity, pipe born water, refineries, hospitals and schools have not been functioning at their optimum level. The security calculus of the Nigerian state failed because it did not include vital aspect of social and national development, such as provision of basic social amenities. Thus, the Nigerian state could not meet the social, economic, or even the military conditions for national security. These are a clear indication that the core social values and physical infrastructure necessary for establishing and sustaining national security, nation survival and socio-political wellbeing of the people are not there. Some example of the infrastructure that has remained in the chronic or permanent state of disrepair low performance and even stagnation thus consisting a several threat to the national security of the country include the country’s airports, sea ports, oil refineries, strategic inter-state highways, rails, bridges etc. Nigeria has demonstrated that it lacks the fundamental requirements for national security namely a major stockpile of strategic defence, civil or general purpose infrastructure. This situation exists due to lack of knowledge skills and vision concerning the requirements of true national security. This is compound

Original Article

by the fact that political manipulation and corruption have led to the misuse, embezzlement and misappropriation of the vital material and resources needed to improve the infrastructure for guaranteeing genuine security

Imperatives for National Development

We have been able to establish that there is a common link between national security and national development. In consequence, any remedial attack on national development must therefore involve issues of national security. Where there is peace and safety there is progress. We propose as follows:

Quality Education

According to Omatseye (2009), “the school is a social institution established by members of the society for the purpose of transmitting their culture from one generation to another”. It improves the culture by producing generations of people who are more refined and enlightened than their parents or forefathers. Naturally, the teacher and the education system in which he (the teacher) operates cannot stand aloof from the society. They are part and parcel of it and are both an embodiment and a reflection of culture, traditions, yearnings and aspirations of the people. This fact though irrefutable at a global level, will at the national level, raise a couple of crucial issues, encapsulated in the question; what are the purposes (goals) of education in the Nigerian social context? Turning to the national policy on education for answer, the Federal Republic of Nigeria (1981 and 2004) stipulated the following major national educational goals.

- * The training of the mind in the understanding of the world around.
- * The acquisition of appropriate skill and the development of mental, physical and social abilities and competences as equipment for the individual to live in and continue in the development of the society.
- * The inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society.

To achieve the national goals “Government shall establish efficient inspectorate services at federal, state and local government levels for monitoring and maintaining minimum standards at all levels of education below the tertiary level” (Ajayi, 2011), This apprehension presupposes the existence of a number of daunting challenges that bedeviled our formal education system, calling for refocusing or repositioning of basic elements, in line with the demands of the 21st century. To address any imperfection in formal education, we must first identify the goals of teacher education. This is why; No education system may rise above the quality of teachers (FRN, 2004).

Dialogue - There is the important need to encourage health discussions among individuals, communities and the government. This will be helpful in understanding one another and identifying issues conflict and negotiating peaceful resolution. Situations of misunderstanding are situations that promote strife and crisis. Dialogue respects individual's views, opinions and sense of self-worth. Understanding raises value and productivity.

Enabling Environment- Government must create enabling environment for sustained entrepreneurial development. Youths must be re-educated and given skills that will make them feel useful and vital.

Proactive Interventions - There should be proper equipping of the regulatory and enforcement agencies for better proactive interventions to address security problems rather than managing by reactions. Our country, so far, seems to derive maximum joy and satisfaction from reaction. A cure seems more appealing than prevention.

Patriotism and self-involvement- Nigeria should also take responsibility for the security and welfare of their environment by offering vital information to law enforcement agencies that will help them burst crime. Indeed, this generation of Nigerians and indeed future generation have no other country than Nigeria. We shall remain here and salvage it together (General Muhammadu Buhari, Former Nigeria's Military Head of State) National development and national security are complementary imperative. The later reinforced the former.

Scientific Application as a Necessity for National Security and Development

Science is a very crucial subject for technological development and as such its teaching and learning must be a matter of national concern. Based on this concern and on the analysis of the situation, the following general objectives are to be satisfied by the senior secondary science subject's curriculum (Ladipo, 1985; Obioma, 2009; Udoh, 2016).

Original Article

- * To provide basic literacy in science for fundamental living in the society.
- * To acquired essential scientific skills and attitudes as a preparation for the technological application of science.
- * To stimulate and enhance creativity.

Unfortunately, despite the fore-mentioned national concern, there is an increasing low enrolment in sciences in schools and in tertiary institutions in Nigeria (Ladipo, 1985) and students performance has continued to witness a downward trend (Udoh, 2016). The everincreasing decline in science enrolment and achievement (Ezeife, 2006) points to the fact that there are increasing conditions for underachievement and slow learning, portraying possible failure of previous efforts of science educators in improving the learning situation (Nkwo, Akinbobola & Edinyang, 2008).

Okebukola, (2002) listed problem areas of senior secondary physics education to include; dearth of instructional materials and laboratory equipments, lip-service attitude of government, inadequate funding and paucity of professionals trained science teachers. On his part, attributed the problems of underachievement in and slow learning of science to ineffective grasp of science concepts by students and teachers alike.

Obioma (2009) capped it all; science is crucial for effective living in the modern age of technology. Given its application in industry and many other professions, it is necessary that every student is given an opportunity to acquire some of its concepts, principles and skills. Unfortunately, the teaching and learning of science has been fraught with challenges which prevent many students from performing well in external examinations. The philosophy, objectives and concepts of science curriculum have been adjudged by professionals in the field to be satisfactory; but its implementation has fallen short of expectation because of lack of sufficient number of qualified teachers, inadequate equipment to ensure the performance of related-students activities which are aimed at enhancing meaningful learning.

From the afore-going, rather than achieve the general objectives of senior secondary science curriculum, science education at the senior secondary level is in coma, needing urgent revival or refocusing.

The hidden message conveyed in the acknowledgement that science education is fraught with a host of challenges which have resulted in abysmal students performance at all levels of education, over the years, with attendant production of half-baked graduate by Nigerian Universities centre on the need to refocus (revamp, restrategise, recreate and stabilize) the practice and delivery of education in Nigeria for sustainable development. Based on the analysis of the situation, the following strategies are advocated for teacher education in general, and physics education in particular.

- * The quality of the existing teaching force must be improved primarily through extensive in-service training programme, incentive package being built into the programme.
- * Better quality of teachers must be ensured through pre-service education of teachers by careful selection and training, effective induction, professional encouragement and adequate remuneration.
- * Admission of candidates into physics education programme should be based on merit and interest, oral/written examination and interviews.
- * Government should ensure that unqualified teachers who are already in the teaching field are sponsored to obtain the required qualification for proper functioning of teaching-learning process.
- * Lecturers need to switch from the prevalence of lecture, the predominant method of instruction in the traditional classroom setting, to inquiry-based, constructivist methods (such as the guided discovery method), including online teaching, learning and research.
- * Government should provide ICT training programme for teacher educators with incentive package. Unless teacher educators model effective use of technology, it will be impossible to produce a new generation of teachers to effectively deploy the new tool in the classroom (Anekwe & Obi, 2009). Thus, unless teacher education programme is redesigned to incorporate, in real terms, modern technologies of teaching/ learning, our education

Original Article

system stands the risk of churning out learners who are neither critical thinkers nor problems solvers, including those who cannot meet the challenge of rapidly technological society of the 21st century

Conclusion

In analyzing the role of the government in relation to the state, Ebeh (2015) identified four important functions of the government. These include: system maintenance function-to guarantee the continued existence of the state and the maintenance of law and order; Regulatory and control functions; Redistribution of resources; and Participation alone or with other actors, directly or indirectly, in the provision of various goods and service. The government is therefore the agency of the state for actualizing the purposes of the state. The ease at which national government fulfils the essence of the state unarguably lies on the degrees of cooperation they enjoy from the people. The state must therefore ensure that there is peace within her borders. The opposite of peace is war. Injustices, corruption, poor planning, tyranny and selfishness often affect development efforts of a nation. These elements breed disaffection, frustrations and in extremes cases, violent eruptions which precipitates crisis and insecurity all over the nation. Peace is synonymous with security. No nation can afford to play with its own security. Emphasis on security therefore must not be limited force or hardware. It encompasses issues of justice, food, good health care, and environment protection, education tolerance and respect for human rights. It is a total package. National security is like personal survival, is the first law among nations. National security is the precursor for national development.

References

- Ajayi, S. A (2011). The Contemporary Challenges of Education in Nigeria. *A lead paper presented at the 7th annual National Conference of the Association for Encouraging Qualitative Education in Nigeria (ASSEQEN) at the Federal government College of Education (FCE) Abeokuta, May10.*
- Anekwe, J. U. and Obi, R. O. (2009). Restructuring Secondary School Curriculum through the Integration of Information and Communication Technology Best Practices. *Journal of Curriculum Organisation of Nigeria, 16 (1).*
- Asad, D. (2017). National affair. Retrieved from <http://www.nigeriavillagesquare.com>. On 20th March, 2019
- Brennan, D. (1961). Setting the goals of arm control. In Brennan (ed.) Arms control, disarmament and national security. New York: George Brazille.
- Central Bank of Nigeria (2005). Statistical Bulletin. Vol. 16, December 2005. Chen, Lincoln, & Leaning in (2003) Jennifer (eds) Global Health Challenges for Human Security. Cambridge: Harvard University Press.
- Ebeh, J.I (2015). National security and national development: A critique. *International Journal of Arts and Humanities (IJAH), 4(2)* pdf. Retrieved from <http://dx.doi.org/10.4314/ijah.v4i2.1> on 23rd March, 2019.
- Ezeife, A. N. (2006). *Physics Methods: The methodology of Physics Teaching*. Enugu: University Trust Publishers.
- Federal Republic of Nigeria (2004). *National Policy on Education*. Lagos: NERC Press.
- Ikejiani, C. (1995). Pathologies of Local Government: Corruption and Fraud. In IkejianiClark M. &

Original Article

- Ladipo, O.A. (1985). *National Curriculum for Senior Secondary Schools, Volume 3: Science. Lagos: Federal Ministry of education.*
- Nkwo, N.I; Akinbobola, A.O; Edinyang, S.D. (2008). Effects of Prior Knowledge of Instructional Objectives on Students Achievement in Selected Difficult Concepts in Senior Secondary School Physics. *Journal of Science Teachers Association of Nigeria*, 43(1&2).
- Obioma, G. (2009). *Federal Ministry of Education Senior Secondary School Curriculum: Physics for Senior Secondary Schools. Abuja: Nigerian Educational Research and Development Council.*
- Ochoche, S. (1998). The Military and National Security in Africa. In Hutchful (Ed.) *Military and Militarism in Africa*. Senegal: Codesirea Ogai, J.O. (ed.) (2003). An analysis of the concepts of development and underdevelopment in communication and national development. Onitsha: Afrika-Link Book.
- Okebukola, P. (2002). Beyond the Stereotype of New Trajectories in Science Teaching. *Text of special Lecture presented at the 43^d Science Teachers Association of Nigeria, 19th – 23rd August.*
- Okoli, F. C. (2007). Politics of development and underdevelopment: Theories of development. Enugu: Ingenious Creation Service Ltd.
- Omatseye, J. N. (2009). *NCE/DLS Course Book on Education, Cycle 1, Modules 1, 2, 3, 4, 5*, Kaduna: National Teachers Institute.
- Onyegbula, S. (2000). Democracy in Nigeria: A critical overview of the journey so far. *News Quarterly journal of the Centre for Democracy and Development* 1(2) October- December.
- Udoh, O. A. (2016). Influence of Teacher Competence and Availability of Resources on the Application of ICT to the Teaching of Physics in SSS. *Multidisciplinary journal of Research Development*, 15 (4).