

## Science and Technology Educational Development: A Precursor for National Security

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### Abstract

Although science and technology education positively impacts societal development, the challenges of national security in the economics, politics, social, educational, physical, and other aspects of life and properties in the nation are daunting and overwhelming. The Nigeria economy is dizzy, the politics although seems stable and unperturbed by the military coups still unhegemony and inconsistent in policies and programmes implementation, there are social vices hither and thither, insurgencies, book haram, kidnapping, maiming, raping, ritualism, unemployment, bad social infrastructures, poor students' academic performance tainted with technological aided examination malpractices culminating into poor scientific and technological advancement which invariably delimit national security and national development. Need to revamp qualitative science and technological education at the basic level, enhance professional teacher development programmes for efficient teaching and learning at all tiers of education, strict punishment of corruptions and corrupt practices as deterrent to such acts in the society, prompts settlement of institutional industrial actions, then, national security can be attained when the tides of examination malpractices wane, the graduates of tertiary institutions are employable and entrepreneurial then, social vices shall be abated, and Nigeria shall be adequately secured.

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## **Background to the Study**

Nigeria youths seems to be poorly trained and educated, right from their basic education to the tertiary level, they experience incessant strike actions some in quarter, half, or a whole academic year without solid continuum in teaching and learning. Even, the period Nigerian youths are in schools, because of fears of the unknown- the usual trend of industrial actions, institutions jam-packed and crashed four months' educational semesters to less than two months, practical in scientific and technological training are skipped, in-depth educational training, teaching, and learning are compromised just to complete the academic sessions. The resultant effects are poorly backed graduates that are unemployable and unentrepreneurial in capacity.

Really, the rise in the tides of insurgencies, book haram, ritualism, kidnapping, herds men terrorism, raping, maiming, cybercrimes, and many social vices in Nigeria are traceable to poor level of scientific and technological education development which are precursors to graduates unemployability and unentrepreneurial ability in the 21<sup>st</sup> century (Obanya, 2021; Ganbari, 2021). The axiom is always true” an idle hand is devil's workshop” and this tenable in Nigerian youth's precarious situations.

Science and technological development are the pivot for national security and development. The strict demarcation between the developed and the underdeveloped nation of the world is the threshold level of scientific and technological education development. Nations like Macao, Finland, Singapore, Netherlands, Australia, Austria, Japan, China, United Kingdom, United States of America, Russia and many developed nations of the world have steady and pragmatic science and technology educational development which invariably breeds their exuberant and buoyant economy and serve as precursors for their youth's employability and entrepreneurial strength for national growth, security and national development. The sad contrast is obtainable in nations at the bottom run of development, nations like Nigeria, Malawi, Burundi, Cameroun, Algeria, Gambia, Ivory coast, Liberia, Gabon and many developing nations of the world, their society and community is un-united and separated from scientific and technological educational advancement. Right from basic education to the tertiary levels of education, the advanced nations of the world get it right, integrating science and technological education not only to the curriculum but experiential and pragmatic exposure of the pupils to use of hands, head, mind, and tools (technology) to teaching and learning in schools. The pupils study nature, cosmos, universe, and environment with tools which enhance the science process and accurate method of knowledge development even at the basic level of education.

Scientific and technological development has impacted educational advancement as we have asynchronous, synchronous, blended instructions, technologically flipped instruction, machine learning, learning management systems, meta verse instruction (augmented reality, blockchain instructions) and many others; transportation development in use of robotic cars, drones propelled airplane, digitalized vehicles, speed boats and many others; communication progression in the use of Global System Mobile (GSM) telecommunication, use of computer, social media, internet of a thing; the encroachment in commerce and

industries; improvement in health services delivery; development in water resources, energy advancement and much more in agricultural development. It would be unthinkable and sternly imprudent for one to decide to trek from Lagos state to Abuja in the 21<sup>st</sup> century while being conservative and energetic at the instance of available motor cars, trains, airplane that can facilitate snappy, cheap and safe mobility, Think of dangers on the road while trekking, the number of days to be expended, the tendency of being knocked down by high way traffics and many other attendant problems just for being crude and non-compliant, so also, the underdeveloped nations would be liken to such individuals without adequate scientific and technological integration and advancement. The present state of debauchery and decadence in politics, governance, security, economy, agriculture, education, health, legal, social, religion other facets of human endeavours in the nation can be mellowed and adequately tackled with appropriate scientific and technological development.

This paper thus clarify some basic terms like science and technology educational development, national security, challenges to science and technology education advancement in Nigeria, issues in nation security, a conceptual model of national security, science and technology educational development to proffer solutions to national insecurity issues and challenges to science and technology education development in the country.

### **Conceptual Clarifications**

#### **Science and Technology Educational Development**

Science from the Latin word “scientia” the Greek word “Episteme”, the German word “Wissenschaft”, and the Russian word “ Nauka ” all relate to wisdom as a methodical body of knowledge (Ephraim- Stephen and Joseph, 2016) the knowledge arranged in an orderly manner, especially knowledge attained by observation and testing of data (Ige and Oke, 2019; Adebisi, 2019; Raimi and Adesina, 2019). Science comprises all the rudiments and conditions of exploration. Science is generally defined as a body of knowledge, a way of thinking, a way of disquisition or system or process of knowledge generation about nature, not just ordinary knowledge but similar that is falsifiable, testable, and empirical (Olagunju, Bolaji and Adesina, 2013).

Adikwu (2015), envisages science as the intellectual and practical exertion encompassing the methodical study of the structure and pattern of the physical and natural world through observation and trial. Ige, Durowoju and Oke (2017), describe science as an attempt by mortal beings to organize their reasoning about nature into meaningful systems of description, explanations and prognostications. similar ideas about nature (scientific knowledge) are products of critical disquisition in a logico- hypothetico- deductive model gauging from empirical hypotheses, reviewing related literature, conducting trial, collating data, assaying data with testing of hypotheses for logical conclusion about nature.

Technology etymology is deduced from the Greek word “Techne” meaning “craft” or an art, and logia, a branch of study, literally, a branch of study of craft (Nnachi, 2000). Technology can be seen as an independent discipline as well as an operation of scientific knowledge to practical task in product of goods and services (Udoh, 2010). Merriam- Webster (2019)

presents technology as the operation of knowledge to the practical points of mortal life or to changing and manipulating the mortal terrain. Technology includes the use of accessories, tools, ways, and sources of power to make life lightly or more pleasant and work more productive. Whereas science is concerned with how and why effects be, technology focuses on making effects be. Technology simply put is a means of employing and exploiting our understanding of nature for our own benefit. It's an operation of knowledge for practical purpose. It's used to ameliorate mortal condition, natural terrain or to carry out other socio-profitable conditioning. Technology is the methodical operation of collaborative mortal rationality to the result of mortal problems through the assertion of control over nature; technology is the machine of growth. Technology can be traced historically to the time man's hunt to ameliorate his way and improve quality of life.

### **Importance of Science and Technology Educational Development**

Science and technology education is veritably important to the development of any nation in numerous areas, in jobs creation and entrepreneurship. A graduate of chemistry education can be self employed, numerous of the physics graduates have some knowledge of electronics that is enough for them to be suitable to have a little period of training as apprentices and stand alone as electronic technician. For instance, Biology education graduates can engage in horticultural plantation, fish culture or animals' production. The graduates of agricultural science education can engage in mechanized farming, crops and animal improvement and marketing, the technology education graduates can set up wood or metal workshops and be gainfully engaged, providing jobs for self and the society.

The key role of science and technology in societal development cannot be overstressed, Egbogah (2012) explained that there is a technological power vacuum in Nigeria staying to be filled by which ever geo- political zone that cares to rally its people through devoted and selfless services. Basically, technology is the primary machine of profitable growth. It's the crucial and essential demand for value addition to raw materials and people. It provides the key to unleashing any country's eventuality in terms of dwindling over-head costs associated with outsourcing and creating employment openings. Numerous developed and advanced countries did progress much because of their heavy investments in science and technology. The United Kingdom and France served immensely from the artificial revolution in the 19th century, also, the United States surfaced from an agricultural frugality and economic prudence in the 19<sup>th</sup> century into an artificial superpower in the 20<sup>th</sup> century. More lately, Taiwan and Korea have exploited advances in silicon microelectronics from the early 1960s. China and India have surfaced as artificial leaders in manufacturing and information technology independently. Malaysia has also followed in the steps of these after Asian successes. It's necessary to emphasize then that in recorded achievements all these countries invested heavily in people, manufactories and structure that handed the foundation for science and technology development.

Roles played by science and technology in poverty alleviation have been central in the progress made to date in the fight against poverty and in stimulating profitable growth. Advances in science and technology education are, in numerous ways, the

ultimate global public good formerly discovered, their benefits can be extended to fresh inventions, creativities and discoveries that alleviate unemployment and poverty. In utmost introductory and critical areas of human need, science and technology have made possible significant progress to date, and they hold the stylish prospects for uninterrupted progress, particularly with respect to crops and animals' husbandry, health, energy, water, and environmental enterprises.

Advances in scientific and technological knowledge and its operation have helped decelerate the trend of high fertility, high mortality and led to increasingly better health for numerous people world over. Nevertheless, vector and water borne conditions, AIDS, child, and maternal cares produce a tremendous burden in the developing countries. Nigeria and indeed many African countries will be unfitted to rightly identify public health requirements and choose cost-effective package of health services if science and technology education capacity is not adequately developed and enhanced.

Development in science and technology education have eased advanced yields in agriculture, improved effectiveness, and nutritive content in the world's food force. Food product, still, must double in the coming decades to meet rising demand and meet the challenges included in interalia perfecting resistance to failure, pests, excess rainfall, saltiness and temperature axes, raising the nutritive content and reducing post-harvest loss all in an environmentally and socially sustainable manner.

Access to affordable energy is essential for people presently living without electricity and is a pre-requisite for profitable growth. Farther advancement and operation of exploration is demanded to find new environmentally and socially sustainable technology that can meet the energy requirements of developing countries (Watson et al.,2003), timely original relinquishment frequently requires significant indigenous technological capacity. Ultramodern clean, renewable energy technologies (e.g., solar, wind, ultramodern biomass) need to be developed further and there needs to be an increase in the effectiveness and sustainability of energy use in transportation, industries, and household use.

Environmental declination at the original, indigenous, and global scale negatively affects the livelihoods, health and vulnerability of poor people. Science and technology are synergetic openings to develop further effective response options to these environmental issues that enhance benefits, reduce cost and further sustainably meet human requirements. The capacity of countries to acclimatize and alleviate can be enhanced when environmental programs are integrated with public development programs.

No economic prudence has ever become advanced with the skew in system of education and training for public force and/ or human capital development. The maximum casualness for science and technology education as an instrument of development has caused valuable damage to our commercial actuality. The problems of misruled parsimony in economy, mass severance, collapse of health and educational services, political instability, affectation, collapsed structure, mass unemployment, gross insecurity etc can all be traced to the low

attention paid to science and technology educational development in Nigeria. It's the lack of science and technology education by Nigerians that has led people to turn their energy to the lust for power, rapacity, and tone destruction. Sorely enough, every Nigerian finds every other person shamefaced as charged, except him or herself. Whenever there is science and technology educational development, there are low levels of unemployment, entrepreneurship increases, corruptions wane, economy thrives and there is increase in national security.

### **National Security**

Psychologists proposed that security is crucial for human survival. Akintunde and Musa (2016), stated that security is perceived as a basic human need that contributes to effective learning. Following the postulation of hierarchy of Needs by Abraham Maslow, the lower needs of man like food, shelter and security must be met before other higher needs like education or intellectual/cognitive needs. The inability to satisfy the need for security may cause stress in individuals and hinder them from pursuing higher level needs. Security also involves existence of environmental factors that instill peace of mind in an individual to empower him or her to function optimally in the society. Poor human relations between teacher and student can hamper students' mental health and cause insecurity. Poor infrastructural designs in schools can expose students to insecurity problems like health hazards and stress. Some female students feel threatened because of rampant incidences of sexual abuse and rape in schools and the society (Akubaka and Ngantem, 2019). Likewise, it is rare to find a school void of social vices. This shows that they are found in our educational institutions primary, secondary, and tertiary and the environment around us. According to Oshin (2020) the vices that are common among young males and females include prostitution, indecent dressing, robbery, cultism, pocket picking, drug addiction, examination malpractice, hooliganism thuggery, gambling, Smoking, premarital sexual activities, and rape. Recently, all these vices have developed to militancy and terrorism, which are pointers to insecurity.

According to Shuaibu, Salleh and Shehu (2015), safe school is one that fosters peaceful, positive, or cordial relationships among students, teachers and administrators. Conversely, insecurity is concerned with feelings of uncertainty, dangers, or threats of life. Insecurity is a negative feeling involving fear, anxiety, uncertainty, and injustice, among others. When an individual does not have control over a situation but must rely on the cooperation of others that cannot be guaranteed, the result may be frustration or insecurity. Insecurity is a threat to learning. Prevailing conflict within communities around the schools often has ripple effects on the teaching and learning activities of such schools.

Insecurity refers to the state of being open to danger, threats, or lack of protection. It is lack of confidence, assurance, or self-doubt. A feeling of uncertainty, lack of confidence or anxiety about oneself. It is also referring to the state of being insecure or unsafe, liability to give way, be lost or become unsafe or fraught with danger. Insecurity is the anxiety on individual experience when he or she feels vulnerable and unsecure. Achumba, Ighomereho and Akpor-Robara (2013), described insecurity as a condition where there exists a vulnerability to harm,

loss of life, property, or livelihood. Katsina (2012) stated that insecurity in Nigeria is a concomitant for the “deep and structurally entrenched crisis of development that creates condition for inequality, poverty, and unemployment.

Bukarti (2021), pointed to the scale of the insecurity in Nigeria threatens the very fabric of Nigerian society that with every attack, human lives are lost or permanently damaged and faith in democracy and the country is diminishing. Some have linked the recent surge of insecurity to the staggering poverty across the country. Youth unemployment currently stands at 32.5% and the country is in the middle of one of the worst economic downturns in 27 years (Adesina, 2021).

### **Challenges of Science and Technology Educational Development and National Security**

Security issue in Nigeria has been worrisome for further than two times now because of rebellion of Niger Delta and Boko Haram (Adesina, 2021). Stretching the averment further, the former is politically motivated while the ultimate is religiously motivated; the reason for the rebellion is trivial to this paper but the impacts on science and technology education development is veritably apropos to national security. People in Nigeria lives in fear of uncertainty of death from bomb explosion from terrorist or fortified missiles and numerous a time from kidnapers. The lives of citizens living in Nigeria are in perpetual peril of mutilating, violating, sexual assaults, hijacking, or kidnapping. Educators and scholars do not know their fate every day until they retired to bed at night; indeed, while sleeping they cannot sleep and close their two eyes because of fortified stealers, bandits or kidnapers. The recent attack on a northern university where scholars and lecturers were cold bloodedly boggled including a professor of chemistry still remains a wakefulness in academic arena (Ogunode, et al., 2021; The Cable, November 02, 2021). Science architectures erected with huge quantum of plutocrat for seminars had been defaced and numerous science and technology paraphernalia and equipments transported down by terrorists and insurgents.

Examination malpractices are the other of the day in the country institutions of learning currently, indeed in teachers training institutions. Numerous of these students threatened lecturers and blackjack them and any schoolteacher who failed to yield to their demand may lose his/ her life or any of the family members. A schoolteacher who is not secure while doing his/ her job cannot put in the best and trending most working practices in instructions. Bad gangs and cultists are each over the institutions of learning posing serious peril to academic communities. Worsen enough is lecturers and instructors also being collaborators and encouraging all forms of examination fraud thereby discouraging hard work among serious science scholars. The trending Information and Communication Technologies (ICTs) backed examination malpractices in downloading life questions and distribution of marking schemes is killing science and technology educational development in the nation. The saddening cause is traceable to bad governance cum poor science and technology educational development

Corruption has eaten deep into Nigeria system and it is manifesting in every sector including education. In Nigeria moment it is not what you know but whom you know that is why reclamation to job is tied down to criteria similar as political favouritism, geographical area or quota system. Numerous of the schoolteacher training institutions and universities can not boast of the stylish academic staff because the stylish presumably don't have godfather who can help them. Appointment is no longer grounded on merit but on whom you know and the quantum you can offer for similar job. Admission into advanced institutions of learning is not always on merit but on whom you know also. Purchases of science equipments and infrastructures are no longer done transparently since it is either the principal or the head of the academy or any of his or her relation who do the force. In this case they neither supply the needed specification nor the needed volume; in utmost cases they do not indeed supply anything. Utmost of the science laboratories are empty structure or structures filled with fake or obsolete science outfit which are useful for nothing but bare demonstration. Plutocrat meant for staff training are diverted to a particular account while selections of those who profit in staff training is on whom you know pattern. All these bounced back on the quality of science and technology education development in the nation. Literacy, subventions, and bursary meant for science and technology education scholars are diverted to non-science scholars because of race. Where the education is given to science scholars, they introduce gratuitous bureaucracy into it that scholars may not get the plutocrat for numerous times or give up of the education.

Nigeria has not been having a stable political system of government since her independence in 1960. Stable political system of government is veritably essential to educational development of any nation. Military ruled for 34 years in Nigeria out of almost 62 years of actuality as a autonomous nation; these times can be regarded as an period of giant waste in both human and natural coffers for Nigerians. These leaders have no regard for education but concentrate on establishing their government for long times. The many times of democratic rule has been times of lack of focus; insentient programs, government educational program changed according to the taste of the political party in power; numerous science outfit and architectures are lying in waste in our institutions because of insecurity in political government. Monthly, budget of Nigeria government revealed lack of focus and dissimulation to good and quality education (Okebukola, 2021; Obanya, 2021; Akanbi, 2022), Yet Nigeria government has not met the UNESCO recommendations of 26% of the total popular allocation to education sector as reflected in her yearly budget. This has abysmally affected science and technology advancement in the nation and favoured insecurities build-up.

Nigeria is blessed with numerous natural coffers on which her frugality rest upon; still over dependent on petroleum has seriously affected the thriftiness. Indeed, the exploited crude oil exploration is not appropriately supervised in the country leading to fraudulent and illogical spending tagged energy subvention or subsidy. The monolithic effect is on science and technology educational development since science infrastructures are not developed in the country and the cost of importing these paraphernalia is high because of exchange rate. All troubles to shift focus of economic prudence from oil image assiduity to other profitable industrial conditioning has not yielded positive result because of corruption. Science and



Technology education schoolteacher's salaries payment and other allowances are not appropriately remunerated and these have led to incessant industrial actions as currently experience by the Academic Staff Union of Universities (ASUU), Academic Staff Union of Polytechnics (ASUP), and the Colleges of Education Academic Staff Union (COEASU) in Nigeria.

### **Solutions to Challenges of Science and Technology Educational Development for National Security**

There 'is no problem without solution, thus what is passing presently in Nigeria as it affects the development of science and technology education have resolution if Nigerians are ready to pay the price. Nigerians must be ready to wage total war against corruption; it should be a war that everybody must take part in. There should be laws made specifically for corruption and this law must be executed no matter whom the culprit person may be. The law should touch every aspect of life; it shouldn't be limited to plutocrat alone as it' is presently. Any government functionary who favoured anybody in admission, employment and creation grounded on race or religion should be seriously sanctioned as someone who stole government resources, Professional bodies in tertiary institutions should rise to the present challenge and ensure they dock the surpluses of their members in institutions. There should be no deals of handout in universities, polytechnics, and colleges of education without proper scrutiny. Violation of this law should be redundancy from the service and any book to be vended should be duly screened to know its worth in content and value. Nigerians should change their exposure; worshipping wealth and position should fade because it encourages corruption. Someone who went to jail for stealing public resources should not become idol or king in the society, he should be seen as a bad person who has lost his respect and quality.

Government should give employment for youthful graduates; Nigeria is blessed with abundant coffers that if duly harness severance and insecurities will reduce drastically in the nation. Government should construct on arable and husbandry systems since the nation is blessed with rich lands. Thus, there will be job for the unemployed and there will be enhancement in profitable security of the nation, if government can construct on husbandry, and arable lands jobs will be created and youths shall be positively engaged, avoiding attempts of terrorism, banditry and kidnapping which challenge societal security.

Programs for science and technology in human capital development aim to give science education at the elementary education, senior secondary and tertiary institutions, prepare youthful people enter a different labor force that requires colorful situations of science and technology complication and encourage the conduct of exploration and advanced training." Implicit" programs for science and technology produce an enabling terrain that stimulates demand for knowledge in the private sector through, inter-alia, a stable macroeconomic terrain. Applicable climates for trade and investment, credit programs, and acceptable intellectual property rights governance. unequivocal programs for science and technology in the private sector end to further break down walls to the use of knowledge. programs for information and communication technology should seek to maximize the access to and inflow of knowledge by, extending access of available ICT to a wider range of ICT growth, and

furnishing training and education to installations of broader use of ICT which is capable of jobs creation and national security sustenance

### **Conclusion**

Development in science and technology education breeds overall advancement in economy, transportation, commerce and industries, agriculture, health services delivery, energy and water advancement which led to creation of jobs, curtail of unemployment, advancement in entrepreneurship, information awareness which curtails corruptions, kidnapping, maiming, sexual abuse, banditry, terrorism, examination malpractices and many other social vices, bringing down national insecurity. Thus, science and technology education development are precursor to national security.

### **Suggestions**

For science and technology education to develop to curtail national insecurity, the following are suggested:

- i. The Federal Government should formulate and effectively implement policies and programmes capable of developing science and technology in Nigeria such as recruiting more science and technology education teachers right from the basic schools to the senior secondary education, engaging and intensifying science and technology education teachers in Professional Teachers Development Programmes (PTDP), giving of special allowances to science and technology education teachers in order to boost their morale and enhance science and technology education development that will invariable engender national security;
- ii. Federal government should establish a more viable and result oriented agency capable of addressing the problem of abject poverty/ unemployment among large population of Nigerians, this will aid in reducing the level of crime and violence in the country.
- iii. Federal government should pass bill on strict punishment like life imprisonment for corrupt public and political leaders to serve as deterrent to others in the society so as to ensure probity, accountability, and integrity in utilization of budgetary allocation to science and technology educational development which would breeds national security

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