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The place of Science and Technology in Africa's Developmental Drive

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Abstract

African countries since gaining independence, have variously quest for development. It appears that their various attempts to get developed have failed to yield results as African countries are still far from being developed. The basic questions on this researcher's mind are: what exactly is responsible for Africa's slow development and what is the way forward? The researcher is well aware that there are many credible answers to these questions but is convinced that the slow growth of science and technology in the continent is largely responsible for her development plight. This research therefore, employing the philosophical methodology of criticism, argumentation and analysis, and relying majorly on secondary sources of data, attempted to show that the development of any nation largely hinges on its advance in science and technology. The paper, in the light of this, reiterated the need to develop science and technology in the continent. It recommended as ways of repositioning science/technology in Africa: a change in Africa's cultural mindset, making efforts to stop brain drain and ensuring technology transfer from developed countries amongst other recommendations.

Keywords: Africa, Technology, Development.

1. Introduction

Africa, as a continent, larks behind in terms of development. Many reasons could be adduced to account for this low development. Some would readily point at colonialism, slave trade, imperialism and neocolonialism as causes of African underdevelopment. Others could point at poor educational system, tribalism, political instability, religious intolerance, poor leadership, corruption, and other social vices. All these named causes in a way, affect Africa's development, meaning that the problem of Africa is hydra-headed.

Though, limiters of Africa's development are multifaceted, I strongly believe that science and technology is one of the highest contributory factors to Africa's sorry state. Africa has produced many graduates in the sciences and many professors, but disappointedly these science scholars have failed to make meaningful scientific impact in the continent. They have failed to improve the continent scientifically and technologically. Due to this, Africa has remained a perpetually dependent continent. It has remained a big consumer continent. It consumes the finished products from the developed world and merely exports raw materials.

There are reasons why Africa, in spite of the many million graduates of science produced yearly, has failed to make a mark in the scientific world. This research would look at the impact African culture has on scientific development; it would also consider the impact of Africa's social ontology on Science as well as how the spending trend of Africans all impact on African scientific and technological development.

2. Reasons for the slow Growth of Science and Technology in Africa

Africa produces millions of science graduates yearly, but has little or nothing to show scientifically for this. Many reasons could be adduced for this, but what I consider the main reasons is explained below:

2.1 Africa's causal explanation affects scientific growth negatively

The growth of science and technology in an area is directly proportional to that society's world-view. It determines what kind of education flourish in the society. To be more precise, the development of science in an area is a function of its explanation of cause and effect. A society that favours empirical explanation of causation would more likely advance in science and technology and a country that favours a transcendental explanation is more likely going to lark behind in science. A little demonstration would perhaps explain this better. Every science investigation follows steps similar to this

1) Observations.
2) Ask questions about the observations and gather information.
3) Form a hypothesis (tentative answers to the questions)
4) Test the hypothesis (perhaps through experimentation)
5) Analyze the data and draw conclusions
6) Reproduce the experiment until there are no discrepancies between observations and theory
7) Formulate a theory or general law.

The first three steps are common to all explanations including philosophical and theological. Every discipline begins with observation as Kant rightly pointed out, which leads to wonder as Aristotle asserted, then questions would be asked as regards the observations. Tentative answers to these questions are what determine, what actually gives direction to the research. It is what would make an approach to solving a problem philosophic, theological or scientific. The third step determines the fate of science in an area. This stage is important because, it determines whether the researcher would continue with the investigation or not. For instance, if one observes sickness 'B' in an area, one would most likely ask a question like; what is the cause of this sickness? His answer (hypothesis) to the question, would determine whether the person would go through with the scientific steps outline above to reach a scientific explanation of the cause of the sickness. If the answer for instance is, the cause of sickness 'B' is a virus, he would most likely proceed to test his hypothesis by way of experiment, and from there go through the other steps or method of scientific research. But if, his answer to the question is; sickness 'B' is caused by an angry god, the researcher would definitely not proceed to step four. This is because the gods, spirits, witches and other transcendental realities are beings that cannot be assessed and tested by empirical means. Postulations of these beings as cause of an event, naturally stifles every effort at scientific explanation. This is the reason, why some people advance more in science than others. Those societies that make recourse to the transcendental for explanation of events are most likely to remain scientific dwarfs. Unfortunately, African societies, mostly favour a transcendental causal explanation, making clear the reason, why they have been unable to develop scientifically, in spite of the many professors of science they showcase.

As Unah rightly asserts, Africans conceptualize the world as that of "extraordinary harmony, one of synthetic unity and compatibility among all things [1]. Everything in this world is "dovetailing into one another"[2]. In this world, events are being "determined by the will of spiritual beings, the operation of automatic forces, and the self-willed actions of men and other animals, which follow in orderly and comprehensive sequence" [3].

An African healer may attribute a disease to a successful natural cause…. Yet the healer may also believe that the same disease is caused by supernatural forces, and would then proceed to cure the disease in these two seemingly incompatible ways.[4]

This means that "an African believes in the empirical (natural) idea of causation following the Western rules of causation and also believes in supernatural causation, which is not analyzable in empirical terms" [5]. A typical African thus explains reality simultaneously from primary (supernatural) and secondary (empirical) causes. It is therefore, common to see a traditional African healer identify, the secondary cause of a sickness to be snake bite, and at the same time locate the primary cause to malicious spirits who manipulated the snake to bite the man. Thus, the cause of the ailment is believed to be snake, but the ultimate cause is the spirits.

This unfortunately is the mindset that characterizes most Africans, even the educated. The transcendental is mostly called forth as explanations of event. In Africa, one constantly hear statements, like "the whites use their witchcraft to produce, while we Africans use our own to destroy". By this they imply that science and technology as practiced by the West is done through the aids of spirits. I have in many occasions engaged in debates with even the educated as regards the wrongness of this belief. This belief is what has held down scientific development in Africa. It stifles interest and motivation into scientific research. If an event is explained transcendentally, it demotivates the mind. For what is the need of empirically investigating a transcendental phenomenon, when one does not have the means to assess the world of the spirits.

There is no need to investigate realities that only humans, gifted with supernatural abilities, are capable of penetrating. This is the unfortunate conclusion that would-be African scientific researchers often reach, explaining the dearth of home grown science and technology in Africa.

2.2 Africa's social ontology discourages research in science

According to Ikegbu and Bisong, social ontology is "what a given society considers as imbuing existence on an individual. It is the value or set of values a society expects from an individual in order to grant him social recognition. It is what adds up to give social significance or respect to an individual. It is the summum bonum of a people" [7]. In Nigeria and most African countries as Ikegbu and Bisong rightly observe: "social ontology is built around material wealth. Money is seen as the precondition for social existence or recognition. It is not knowledge, honour or integrity that counts but the money a man has" [7]. One is honoured, given titles, positions etc based on whether or not he is rich. This ugly perspective to life has made many Africans to disparage academic achievement, hard work, honesty, and more distressing, research too is spurned. For success in this without monetary backup, gives no one social existence in Africa. Africans therefore, in order to exist (socially) madly rush after money. It is not the means to the money that matter but money itself. This is exactly why we constantly hear of evils like: looting, embezzlement, extortion, bribery, kidnapping for ransom, child trafficking, armed robbery, money rituals etc daily in Africa. This is the reason we also hear of admission racketing, examination malpractices, certificates faking, plagiarism etc in African schools. Most Africans, go to school, not really for the knowledge but for the certificate; for the certificate is a sort of springboard to land at money.

It is an open secret that, in Africa, it is not knowledge that pays, but certificate. Thus, many are ready to buy and sell it. The understanding that hard work and knowledge do not really pay in Africa, is a killer of the motivation to research. This is why most African students copy and paste assignments and research projects. Only few painstakingly undertake research projects in Africa. This is exactly the reason why we produce millions of science graduates yearly without anything to show as regards scientific discovery. Researchers are meant to solve problems or discover new facts, but researches in Africa produce almost nothing of worth. It is clearly because; almost all Africans quest for money, and seek a short cut to it. Definitely, research is not a short cut to money, explaining why it is not attractive to African students.

African governments consistent with the prevailing social ontology do not encourage research and academic excellence. This is clearly revealed in the lamentable awards given to students who excel academically in Africa. Those who excel in academics end up getting pittances as award – this deters others. In University of Calabar in Nigeria, for instance, the best graduating students were given, ten thousand naira as a price (*confer* University of Calabar Convocation Brochure of 2015). This is ridiculous, especially when we consider that a winner of beauty pageantry in this country go home with millions of naira and a brand new car. Even a winner of a dance competition goes home with millions of naira, but the best graduating students receive an amount that cannot even buy a good book. African societies' value for educational excellence is clearly very demotivating.[8]

Government's attitude to equipping of school libraries and laboratories is also a pointer to the fact that African government sees education, as a waste of investment. This is perhaps why no African country has been able to meet the 23 percent budgetary benchmark for education as recommended by UNESCO. This is not surprising, a government cannot be interested in education, if the people that makes up the government are not interested in education and research.

It is the people who determine to a large extent how government spend their money. Thus, if the people are interested in education and research, the government would invariably be swayed in that direction. Academic Staff Union of Universities (ASUU) has many times used strike action to twist the arms of government to meet their demands. If the general society were to embark on such an action, demanding a better funding of education and research, much would have been accomplished in education. Government attitude to education in Africa is a general reflection of the societal attitude.

2.3 The spending trend of a society determines its educational growth

Africans are largely consumerist minded. It is common in Africa, to see one man having fleets of cars and private jets, clothes (needed and unneeded), shoes and other liabilities. This is all in a bid to show the society that he has attained social existence (that is, wealth). Africans tend to spend their money on ostentatious items that will give them social recognition. Research evidently is not one of such things that bring recognition in Africa. This is more so, when we consider the fact that some research no matter how noble the findings, do not bring money to the researcher. Examples of such researches are: research on the feeding or mating habit of snail, research on the behavioural patterns of sharks, research on the biodiversity loss of the ecosystem etc. These researches take money from the researcher and bring little or nothing back and clearly would not be appealing to a typical African. I know how many times I have been asked by friends, how much money, I gain by attending and presenting papers in academic conferences. For Africans, this is absurd and a waste of time, resources and energy. Researches especially ones that have no economic end are considered absurd by typical Africans.

A typical African abhors risk-taking due to his strong value for life. Investment in research is a high risk, for the result of the research may come out fruitless. Most researches cost billions and thus could lead to a loss of fortune, if it does not yield the expected results. Many people have lost their lives and many more have been maimed in the course of researching. Some researchers are not just financially risky, they are also physically risky. It therefore, takes one who sees research as greatly valuable to invest in or undertake researches.

3. Why science and technology need repositioning in Africa

The importance of science and technology is known to almost everybody. Africa, alongside other humans have benefited tremendously from science and technology. However, Africa has remained largely a receiver of technology and less a producer of it. There is no doubt that, these foreign technologies have improved lives and the economy of Africa generally but we cannot proudly glory in them. By depending on foreign technologies, Africa has remained a dependent continent, independent merely in name. To be truly dependent, Africa must begin to develop its own technologies and possibly export these technologies to the other world.

Technologies developed in Africa, would not just improve the lives of Africans, but unlike foreign technologies would also bring revenue to the countries. Foreign technologies sap from Africa, but Africa would sap from homegrown technologies. The trillions send to other countries by Africans, for purchase of vehicles alone, could speed economic development in Africa, if the money was spent on made in Africa vehicles. The same goes for other technologies. Africa spends much to bring these technologies to the continent or to gain from the products of these technologies. It would spend less, if most of these technologies are grown in the continent. Home-grown technologies therefore facilitate national growth and development.

In addition to saving money for African countries, and thereby promoting national development, home-grown technologies would reduce the unemployment in Africa. The mega companies that export cars, telephone, television, etc to Africa, surely are run by employees. If Africans were to develop technologies and set up companies, unemployment would definitely reduce. Cost of living too would reduce, as products made at home would surely be cheaper than imported ones. When cost of living is reduced, definitely the lifespan as well as the standard of living of Africans would increase.

Advance in science and technology therefore, increases the GDP and GNP of a country, thereby increasing its economic development and also improving the living standards of the citizens. It also gains the country or continent international recognition. Ability to sustain one is what gives someone, country or continent true independence. It is also what gains respect for individuals and countries. One naturally is inclined to respect more, someone who provides for his needs than one who depends on others for sustenance. African countries are bound to be respected and taken more seriously, if they are able to depend less on externally manufactured goods. And also, if they are able to contribute to the growth of world's science.

As outlined above, science and technology have the capacity to positively affect Africa's economic development and consequently national development; it also has the capacity to improve the living conditions of Africans and thirdly, it could improve international relations between Africa and the rest of the world. These three reasons I guess are enough to encourage or instigate research in science in the hearts of students. I have the feeling that, if Africa is not technologically independent, it may not attain the much needed development.

4. In lieu of conclusion: Steps needed to reposition Science and Technology in Africa

From the exposition above, it is crystal clear that science and technology play a central role in a nation's development. But how then, do we make Africans imbibe the culture of science? How do we make science to develop in this area? Most scholars would agree that this would not come by chance. Aristotle is one scholar that argues that virtue conduct does not arise by chance. In answer to the question, does virtue arise by chance?, Aristotle argues that virtue develop in man not through chance but through habitation. That means, virtue develop through forced training [8].This forced training for children comes from the parents and for adults it comes from the force of the law. Laws as conceptualized by Aristotle are not laws that lack force like in the case of Nigeria and other African countries, but laws that are well implemented and executed.

I agree with Aristotle, that virtuous actions do no arise in humans by chance but through forced training. This implies that the virtuous culture of science and technology would not develop in Africans by chance. There must be forced training through the instrumentality of the laws. But how is this to be achieved? My answer is as follows:

- Laws should be enacted that would require a person to show evidence of scientific discovery or achievement, before he/she would be made a professor. It is ridiculous to think of a professor of science, who has nothing he professes. If laws are made that require evidences of scientific discoveries before one is made a professor, I believe many academics would take genuine research

seriously. When I talk of genuine research, I do not mean library research as is now mostly the case in our science faculties, but field research, for this more properly belongs to the sciences.

- Laws should be made those barrier students from graduating without a scientific solution to a problem. Research projects carried out by science students are meant to solve some scientific problems, but unfortunately, African students hardly solve anything with their researches. Most discoveries and technologies enjoyed today in the world, are product of such researches by students from Western and Asian countries. Regrettably, most students in Africa, copy their projects from readymade projects. But if there is a law, requiring proofs of new ideas and discoveries as prerequisite for graduation, students would sit up.
- Make laws that would stop brain-drain. It is an open secret that the best brains in Africa through means like: American lotteries, foreign scholarship schemes, fellowship programmesetc are yearly shipped to developed countries. These programmes are targeted at the best brains, and unfortunately, they have been highly successful. It is believed that one in every nine people, born in Africa and have a university degree migrates to one of the 34 member states of the OECD – the world's most developed countries [8]. According to a report by the United Nations' Department of Economic and Social Affairs, and the OECD secretariat, there are about 30 million African migrants [8]. When the best brains leave the continent, what becomes of the continent, is exactly what Africa, is passing through now – underdevelopment. Those brains that have shown convincing prowess in scientific research should be retained as researchers in universities and well encouraged by a nice working environment and adequate pay.
- There should be laws that would enforce technology transfer. It is sad to note that most foreign companies have operated for many years in African soil, and yet the technology involved in production is still a mystery to Africans. For instance, till now the mother liquor of Coca-Cola and other mineral drinks is not known to Africans. The oil companies are still manned by expertise. These foreign countries obviously are not doing enough in the aspect of transferring their technology to the host countries. I believe laws should be made that would give a foreign company number of years to operate in an area, before transferring the technology to the host country. There ought to be this sort of memorandum of understanding, between foreign companies and their host countries, before the start of production or business of any kind.
- Government should make laws that would ensure that researches are well funded. Most researches are cost intensive and thus out of the reach of some students and scholars. Though, government has a responsibility to fund research, it is not the sole task of government. In developed countries private companies and individuals fund research. The law in African countries should require that companies contribute a percentage of their profit for the funding of researches. These funds should be made easily available to students and researchers with good research plans.

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