

## Science and Technology: A foot path to National Development

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### Abstract

It is a common knowledge that apart from food security, one of the major and fundamental tool for any nation while it is undergoing changes towards national growth and development is its progress in science and technology. Science and technology are two very important as well as basic need of any nation especially in the current contemporary world. Development in Science always goes in *pari pasu* with technology. Perhaps, the two are always inseparable. And despite the fact that a lot has been said and documented on the two aspect of national development, there is always the need to make update on the current needs, problems and to suggest possible way out. In this paper, science and technology and the desperate need to re-consider them for national development of our country have been highlighted.

**Keywords:** Science and Technology, National development, Nigeria

### INTRODUCTION

Science is the study of knowledge which can be made into a system and usually depends on seeing and testing facts and stating general laws. Technology on the other hand is the practical application of scientific knowledge or inventions to the solving of everyday problems or facilitating tedious human activities through science. Through application of scientific and technological knowledge professionals have able to invent equipment's and machines that are been used in industries and even our homes. In addition to this science and technology has help in easing stress brought by the movement of goods and people from one place to another by the use of automobiles, aircraft and so on. More over rural communities are transformed to urban through provision of electricity, pipe borne water, good road network, schools, hospitals and other social infrastructures. Furthermore science and technology has help in areas such as agriculture, communication, medicine, engineering, drugs development and all other aspect of life thereby improving the livelihood of people.

The aim of this paper is o review the aspect of science and technology and the need of the country for these aspects for its development.

### The Key Role of Technology in Societal Development

Technology plays a fundamental role in wealth creation, improvement of the quality of life and real economic growth and transformation in any society. The United Kingdom and France benefited immensely from the industrial revolution in the 19th century. Similarly, the United States emerged from an agrarian economy in the 19th century into an industrial superpower in the 20th century. More recently, Taiwan and Korea have exploited advances in silicon microelectronics from the early 1960's. China and India have emerged as industrial leaders in manufacturing and information technology

respectively. Malaysia has followed in the footsteps of these later Asian successes.

It is to be noted that in the recorded achievements, all these countries invested heavily in people, factories and infrastructure that provided the foundation for today's industries. These successes were all based on carefully designed roadmaps of plans and strategies. Unfortunately, however in many if not all the non-developed/"yet-to-develop" countries, technology is seen or viewed as a consumable item, and not something that can be produced or created.

Essentially, technology is the primary engine of economic growth. It is the key and fundamental requirement for value addition to raw materials and people. It provides the key to unlocking any country's potential in terms of decreasing overhead costs associated with outsourcing and creating employment opportunities. Common examples are:

- Bio and Nanotechnology areas.
- Basic needs arena (food, clean water, improved public health, shelter etc).

Analysis of technologically advanced economies shows that at each level of the economy, science and technology provide the engine for economic growth. For example, in the case of primary products, application of science and technology significantly increases the yield from agricultural production and mineral beneficiation.

Similarly, new and existing industries do stimulate economic growth at the intermediate level, while the overall volume of activity at the tertiary level is amplified by increased use of science and technology associated with information technology and improved distribution/ marketing networks. Therefore, the need for countries with the intention to grow, to invest significantly in science and technology cannot be overemphasized. This is achieved by developing the talent, the human capacity required to compete in a globally competitive world of today.

Technology is achieved through a combination of knowledge, Methods, Tools and Skills.

This four-element definition of technology offers the details and clarity required for technology enhancement planning that must necessarily include knowledge and skills upgrade (training) and acquisition of methods and tools including hardware and software systems. The idea here is the understanding of human elements (knowledge and skills) and the tangible elements (methods and tools) of technology. Accordingly, it was essential to enhance the capabilities of the staff on one hand, and on the other hand to acquire the necessary tools and methods.

### The Nigerian Situation

From its creation in 1914 until present times, the government of Nigeria has never had a sustained focus on the development and application of technology for the transformation of the national economy. The education curriculum was not designed to deliver leadership base in science and technology as basis for progressive national development. This led to nationalists to clamour for modifying the school curriculum led by Dr. Nnamdi Azikiwe, the leading nationalists attacked the University College, Ibadan "the million dollar baby", as academic, classical, expensive and utopian. They observed that while programs existed in the college for training Nigerians in Greek and Latin, no serious programs existed for training Nigerians as Engineers, Scientists and Technologists. They were anxious to establish a national University with practical oriented curricula. In fact, quoting from the publication "The Origin and Philosophy of the University" the author, *Professor B. I. C Ijomah*, said of *Dr. Azikiwe* that the main point that was made in the latter's 1937 book "Renascent Africa" was that there was no indigenous University in Africa which could reflect the culture, values and aspirations of Africans as advocated in 1920, by a group led by Ghana's *Casley Hayford*. Thus, *Dr Nnamdi Azikiwe* was determined to found an African University in which Africans would study in an African environment and within curriculum that will usher technology in the National mindset.

### Problems and Challenges to National Education Policies

Policies when documented are fair and genuine but the implementation often encounter bottlenecks hence objectives and goals are eventually rarely met. Babalola (2008) noted the problems associated with educational policy and planning in Nigeria, which includes those of power relation at the directive stage of planning, poor preparation and costing, and weak evaluation of projects. With respect to the implementation of educational policies, Olujuwon (2002) identified areas either not implemented or not satisfactorily implemented to evolve around the following; the development of national consciousness and unity, inter institutional cooperation, teaching and learning, areas of need and priority, training of staff in methods and techniques of teaching and indifference on the part of government.

A lot of funds are pumped into policy planning and documentation but it is disheartening when the policy in November 2, 2006, the Honourable Minister for Education at one of the official ceremonies in Abuja delivered the keynote address titled "science and technology for youth empowerment" specifically states as follows:

Our education system is malfunctioning creating in particular problems of scientific and technological manpower production. The situation is so pronounced today that the nation faces crisis of scarcity of scientific and technological manpower. In essence, we are producing less and less of leaders of tomorrow: the managers, the entrepreneurial class, the teachers, the doctors, the policy makers, the law enforcement makers, the professionals.

This is because the transition through the various levels of education is not in favour of technology and science career.

The situation has worsened today as many vocational and middle level manpower development institutions, the polytechnics (Yaba College of Technology and Kaduna Polytechnic, and others as currently being proposed) are being converted to degree-awarding institutions. Historically, no economy has ever become developed with this skew in their system of education and training for national manpower supply and/or human capital development.

The plans fail to yield through lack of implementation or bad implementation. Supervisory and financial problems are also some of the reasons for failure in the implementation of education policies in Nigeria.

### The Way Forward

From the foregoing, there is clear demonstration of governments' positive intentions for science and technology education having realized that it is the vehicle by which a nation can be lifted to attain scientific and technological sophistry. This is overwhelmingly but to pretend that there is no shortfall in enrolment and performance in science and technology education is deceptive.

The utter disregard for science and technology education as an instrument of development has caused incalculable damage to our corporate existence. The problems of mismanaged economy, mass unemployment, collapse of health and educational services, insecurity, inflation, collapsed infrastructure, etc can all be traced to the inadequate attention paid to science and technology in Nigeria. It is the lack of science and technology initiative by Nigerians that has led people to turn their energy to the lust for power, greed and self-destruction. Sadly enough, every Nigerian finds every other person guilty as charged, except himself or herself.

Government's policy on education has among other issues emphasized but not driven the following objectives:

- The training of the mind and the acquisition of appropriate skills, abilities and competencies – both mental and physical – as equipment for the individual to live and contribute to the development of the society.
- Ensuring that all schools are properly equipped to promote sound and effective teaching, and in particular, that suitable textbooks and libraries are provided for schools.
- Secondary education should be six-year duration and be given in two stages, a junior secondary school stage and a senior secondary school stage. The junior secondary school (3-year duration) will be both pre-vocational and academic. It would be free. The senior secondary school would be for those *able* and *willing* to have a complete six-year secondary education.
- A greater proportion of education expenditure would be devoted to science and technology and a greater attention paid to the development of scientific orientation.
- The ratio of Science to Liberal Arts students in the Universities was fixed at 60:40.

However, it is common knowledge that three decades after these objectives were set out to improve the standard of education in the country, not only have one of the objectives been realized, but also the standard of education has fallen far below what it was before.

Some aspects of government's policy on Science and Technology which are relevant to our discussions here include:

- Science and Technology shall form the basis for our development and shall influence our thinking and working processes.
- We must ensure adequate development of manpower in Science and Technology to guarantee the efficient utilization of abundant natural resources and reduce the drain on our treasury, and independence on outside sources for industrialization.
- The nation should be technologically self-reliant in the production of capital and consumer goods and raw materials.
- The educational system shall emphasize science at all levels and re-orient the entire society towards scientific thinking in order to develop new technologies and adapt existing ones to improve societal well-being and security.
- Major government projects involving imported technology shall be procured in an "unpackaged" form.

### How Then Can Nigeria Be Technologically Self-Reliant?

Instead of procuring the "unpackaged" form of technology, as stated in the policy framework, Nigeria not only buy "packaged", but "packaged, polished and sealed" technologies, thereby foreclosing any idea of adaptation. This has to STOP as technological institutes should lead the development and/or refinement of new technological break-through fit for the Nigerian environment.

Frustrated out of the system by lack of facilities to work with, Nigerian intellectuals and professionals have been seeking and receiving refuge abroad where facilities are provided and their services and contributions appreciated.

## CONCLUSIONS

Since science and technology are part of the national strategy for development, its literacy is essential. Part of what is needed to enhance that process is public pressure to encourage more Nigerians to study science and technology. Science and technology education has suffered enormous setback in Nigeria due to the low status accorded to it in general. Some of the problems emanate from the various interpretations of science and technology education by policy makers as well as by the implementers of policies on science and technology education. New policies are needed to clarify the importance, role of science and technology education, and to address the requirements in various sectors of society. In view of these the following recommendations are made.

### Recommendations

- All stake holders in science education from policy makers to implementers including parents must have input in national development.
- The government should demonstrate its political will in working to rebuild the Nigerian economy through science and technology education.
- The government should make science and technology education a priority in its broad national development strategy. · Science and technology education should be supported by foundations, business, NGOs and international development agencies.
- The gaps between science, technology and the public should be bridged.
- The government should encourage and support the establishment and development of professional science and technology organizations, especially teacher organizations nationwide.
- There should be effective and proper monitoring of educational practices from pre-planning stage through planning stage to post-planning stage (implementation).

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