SCIENCE AND TECHNOLOGY EDUCATION AND NATIONAL DEVELOPMENT

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Abstract

Science and Technology are twin tools that form the bedrock for any meaningful scientific and technological development of any nation. This paper therefore, solicits the sincere co-operation of the federal and state governments, the society at large and the educators including the professional classroom science teachers to brace up and face the 21st century challenges posed by a progressive world. This paper sees the need to re-visit the National Policy on Education-Science and Technology Policies inclusive, which covers the 6-3-3-4 (Four Tier) system of education. The paper is further concerned with the nation's slow pace in building and promoting nationwide effective science communication system and the pioneer space journey. This paper X-rays the great task borne by all teachers in general and science and technology teachers in particular. Finally it sees the great development in a nation through the acquisition of science and technology education.

Introduction

Science and Technology are two important and inseparable knowledge any nation must always strive to acquire through education, they form the bedrock for any meaningful scientific and technological development of any nation.

As the Nigerian nation progresses into the 3rd millennium which is the 21st century, the greatest challenge that probably faces her will be that of survival in the midst of numerous challenges in an intensely competitive world, completely master minded by the great might of science and technology.

Historically, the impact of science and technology has never been closely felt and experienced by mankind before as it has been in the recent years.

We could imagine life without some of our modem luxuries such as radio, television, electricity, transportation, telephone system and a litany of others. Nor could we think of the sick in the hospitals or at home without proper and adequate drugs and other vital medical facilities to aid the medical personnel effectively and sufficiently carry out their duties of saving lives.

There is no doubt, that the rest of the world is making revolutionary advances in science and technology education. For instance, there is huge revolution in the area of information/communication technology. Other areas are scientific creation (cloning) of humans and animals e.g. "Dolly" the sheep, robotics, genetic engineering thus producing genetically modified foods, artificial intelligence and the manufacture of anti viral drugs for killer diseases such as HIV/AIDS, Ebola and malaria, In spite of our knowledge of all these scientific and technological feats, the Nigerian nation is apparently not fully ready and willing to commence the scientific race alongside with other nations.

The teaching and learning of the science based disciplines in our primary, secondary and tertiary institutions is drastically on the decline and it poses great concern. This sad experience could be confirmed by going through the Senior Secondary School Certificate Examination (SSCE) and the Joint Admissions and Matriculation Board (JAMB) results and other tertiary examination results made public. This negative development will surely send bad signals. Our highly qualified and experienced teachers in these various science subjects are seen in their teeming numbers fleeing this country to "greener pastures" outside, as teachers, scientists, and other related professions.

Now the salient questions remain unanswered; Which way Nigeria? Should our former attitude and behaviour towards teaching and learning science and technology be maintained and continued? Can this nation survive the great challenges of the 21sl century when the scientific and technological base continues to weaken and fall in disarray?

In this complex world if this nation is to survive and be self reliant in the competitive and growing world economy, all the citizens of this great country must begin in earnest the collective task of

laying a sound foundation for science and technology education in our school systems from primary to tertiary levels. The three tiers of governments (Federal, States and local councils) are expected to encourage science and technology teachers and students by way of better pay, in service training, seminars and workshops participation, and provision of laboratories and other facilities and infrastructure in conjunction with scholarship and grant awards to students. Accomplishing most if not all the aforementioned obligations by the governments, the most recent over prolonged strike action that lasted for over six months by the Association of Senior Staff of Universities (ASSU) could have been averted. However, at the achievement of these vital needs, the teachers should remain dutiful and dedicated to their profession to achieve the objectives of science and technology education.

National Development Plan and National Policy

In the national objectives of Nigeria as stated in the Second National Development Plan and endorsed as the necessary foundation of National Policy on Education of 1981 and revised (1998), among other things emphasized were the:

A. Need for a united, strong and self-reliant nation.
B. Need for a great and dynamic economy and,
C. Need for a land of bright and full of opportunities for all citizens.

Furthermore, the primary education, which by the same policy is the key to the success or failure of the whole system has some of the following objectives:

1. The inculcation of permanent literacy and numeracy and the ability to communicate effectively.
2. The laying of a sound basis for scientific and reflective thinking.
3. Developing in the child the ability to adapt to his changing environment (through public enlightenment campaigns and seminars).
4. Providing basic tools for further educational advancement including preparation for trades and crafts of the locality.
5. The last but not the least, thus, giving the child the opportunity for developing, manipulative skills that will enable him to function effectively in the society within the limit of his capacity. Furthermore, within the frame work of this National Policy on Education is the secondary education, which has its specific aims in parts:

A. To equip students to live effectively in our modem age of science and technology.
B. To inspire the students with a desire for achievement and self improvement both at school and in later lives, and finally,
C. To develop and project Nigerian culture, art and language as well as the world's cultural heritage.

The 6-3-3-4 **System of Education**

The policy towards this system is very much on. This was an innovation by the Federal Ministry of Education in conjunction with the Federal Military Government in the 1980s, All things being equal to successfully achieve the aims and objectives of this system, the joint co-operation of all and sundry involved in the implementation of this policy ranging from teachers, examinations bodies, the governments and educational establishments must endeavour to play their roles without fear or favour.

Again, the national policy on admissions into tertiary institutions on the ratio of 60% into the sciences as against 40% into the arts and social sciences or humanities was a positive thought in the right direction. What the educational system and the schools need to do at this daring need to effect the 60% for the sciences should be absolute hard work, dedication to duty and sincerity of purpose by the science teachers and schools, to teach and encourage students who have registered to study the science disciplines to succeed for national development.

Overload Task on the Teachers

There is no doubt in the statement that teachers in general in this country are overloaded with

the task of teaching in schools from nursery to the university levels. At each level of studies, the pupils/ students' population is quite overwhelming. The teachers are faced with lack of or inadequate teaching materials, facilities and infrastructure to carry out their professional jobs. The hopelessness of teachers especially in tertiary (universities) institutions was exactly highlighted in this regard during the last ASUU national strike that lasted for over six months from late December 2002 to late-June 2003. Worst of it all, teachers in this country don't receive the desired respect and honour from the society they are living in.

It is pertinent to note that no nation in the world stands for development and nation building without the enormous contribution of teachers towards the production of the needed manpower or human resources for the industries, schools, hospitals and other related areas. According to NCCE (1995) in Isyaku et al (1998:"91"no nation can rise above the level of its teachers". Therefore, science teachers deserve some financial rewards or encouragement and some other incentives to be fully motivated to organise and impart their knowledge to the young and old for the speedy development of our great nation, Nigeria. According to Buskirk (1976), "our true source of power in the world has not been our armies and certainly not our diplomacy but rather high productivity".

National Awareness, the "Sputnik" Russian Experience

It is very essential for the Federal Government of Nigeria to constantly create awareness of the value or benefits of science and technology education for the development of this nation in all aspects of life. Due to the national sensitivity and consciousness in the field of science and technology, about four decades ago in 1959 precisely the Russians became the first nation in the world to venture into the unknown world-the great space beyond, by launching their first spacecraft and first astronaut. This brilliant and scientific move silenced and shouldered the whole world, while putting the American government and her great scientists into scientific chaos, doubts and dumbfounded, not knowing or recognizing their strength to perform. The Nigerian government needs to create adequate awareness, motivate and encourage potential interests through whatever means it could for the promotion of science and technology education for national development.

Science **and Technology** Education **and National Development**

From the previous information we now understand the constitutional empowerment to the government and the entire citizenry to study and acquire the knowledge and skills from science and technology for national development. The importance of science and technology as areas for studies and acquisition of knowledge cannot be over emphasized. The areas are of immense importance for the mental, physical, social and even economic development of individuals and our nation as a whole.

The acquisition of science knowledge goes a long way to promoting the living conditions of the entire citizenry, via personal hygiene, improved feeding habits and proper dieting, proper control and management of the environment including sanitation to mention just a few. As science awareness is created in all aspects of it, individuals will tend to spend less money on disease attacks, ill heath, and medical treatment. By so doing the nation (governments) on the other hand will spend less on such areas and could re-direct such funds towards adequate and general education for all and sundry as provided for by both the country's Constitution of 1979 and National Policy on Education (as revised 1998).

When citizens of any country or nation are well and healthy, then there is strength and the will to carry out some productive activities for national development. The by-products of science and technology are everywhere around us. But the most easily seen and felt are the material ones, namely, motor cars/vehicles, aeroplanes, electricity, telephones, building and a host of other products.

Shedda Village and Science **and** Technology

The establishment of the science and technology village located at Shedda, about 80 kms from the capital city, Abuja is informed by the desire to have a befitting and adequate research centre for higher technology and applied science and technology activities for national development, The concept of the science village is highly commendable and I hereby appeal to the Federal Government to fully utilize the village in achieving the nation's yearnings and aspirations of greater technological heights. The centre will also hopefully give individuals and institutions or establishments a wide range

of research and development opportunities in the areas of science and technology for national development.

This is a century of developments of various types by the nations of the world. Again this is an anticipated century of space racing by the "third world" or undeveloped countries of the world. As I rejoice with the rest of the citizens that our country Nigeria has been working hard to have her first satellite launch into space. I equally regret the circumstances that prompted the postponement of the nation's first satellite launch on July 25th 2003 as informed by the Nigeria Television Authority (NTA). That singular launch would have boldly printed our name in the golden book of the space travellers. Thereby motivating both the young and old scientists and the government to prepare for more events to come. However, we are watching events and fully solidly behind the -Federal Government in her science and technological break-through.

Recommendations

1. For national development and for a nation to move forward, the Federal Government cannot do it alone with the finite oil resources. There is need for a concerted effort by all and sundry in the country to assist, motivate and encourage the studies of science and technology in any form possible.

   The Federal Government should endeavour at all times to honour its obligations whenever there is a signed agreement with teachers or labour unions in order to avoid unnecessary strike actions that may disrupt the national programmed activities and thereby de-railing or delaying national development.

3. Parents who are capable should endeavour to establish family library at home to enable their children or wards with curious minds to seek and develop their talents especially in the sciences. Also, such parents can plan trips or excursions to some vital industries, game reserve centres etc, to expose and enhance the children's interests in nature.
4. The Government should find the appropriate means to carry out information dissemination and public enlightenment campaigns on matters of serious concern such as the endemic HIV/AIDS, Ebola disease, space journeys and scientific creation of animals and humans instead of natural creation. Again, the consequences of the genetically modified foods that is controversial in Tanzania and the U.S.A now. All these attempts will surely work towards national development.

Conclusion

It may be wise to conclude that, as soon as any nation succeeds in the struggle for political freedom, the next immediate thought of that nation should be economic freedom or self-reliance either with the availability of materials both natural and otherwise or adequate human resources. Although this will be achieved through the appropriate training and development of manpower.

For any nation to be wealthy that nation must surely invest on her citizens and depend on its extensive use of science and technology and this will mean the development of science policy alongside with the social and economic policies.

Furthermore, for Nigeria to move forward scientifically there is the urgency for the Federal Government to quickly complete all the facets of the science village at Shedda and make the centre fully functional or operational for effective science communication and dissemination of scientific information within and outside the country for national development.

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