

CHALLENGES AND PROSPECTS IN SCIENCE AND TECHNOLOGY EDUCATION IN NIGERIA

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Abstract

This paper examines the challenges and prospects in science and technology education in Nigeria with a view on the concepts of science and technology education, science and technology education towards national development. Also mentioned in this paper is the national policy on science and technology education for sustainable national development and their challenges. The paper made plea for urgent need to effectively implement the national policy on science and technology education, review the curricula content, develop our local science and technology to meet our local needs, provide adequate funding, manpower and enabling environment for the advancement of education in Nigeria.

The evolutions and successes of the world today are products of science and technology. A close and careful examination of the wonders and achievements of science and technology would make one to believe and generalize that science and technology (ST) have the solutions to world and human problems. By the nature of science and technology, man has been able to expand and exploit his environment for his benefits. However, this does not rule out some cases of mishaps.

Science and technology has proven beyond all reasonable doubt that earthly resources are inexhaustible and can be regenerated through continuous scientific and

technological means via education. Education, which is the process of acquiring basic skills and knowledge, is fundamental for science and technology to thrive.

Education by its nature is seen as the foremost instrument/agent of change in any society. This is sequel to the fact that education alone has remained the basic tool for rapid, social, economic, political, moral, scientific and technological development of any society – Nigeria inclusive.

It is obvious that science and technology are also agents for rapid and progressive socio-economic development, effective and qualitative education is needed for its sustenance. Hence, no nation can develop more than its development in education (Edobor and Maliki, 2006).

According to Agboghroma and Umudhe (2007):

The utilization of science and technology in national life marks the difference between development and under-development. This is why some nations of the world are classified as either developed or under-developed as a reflection of their state of scientific and technological development. While the developed world is characterized by their attainment of sophistication in science and technology, the under-developed countries lack such characteristics.

Agboghroma and Umudhe were of the view that for a nation to be regarded as developed, the level of science and technology must be very high and sophisticated. They affirm the views of Edobor and Maliki (2006) that “no nation can rise above the level of its scientific and technology attainment”.

Meanwhile, for any nation (Nigeria inclusive) to attain sustainable national development there is obvious need to recognize science education as a priority area of education for her citizens (Ogunmade, 2006). In the same vein, Imiere (2004) asserted that the quest for national development vis-à-vis scientific technology, growth and self-reliance should be matched with corresponding progress in the science and technology education.

This paper examines the challenges and prospects of science and technology education in Nigeria alongside ST education towards sustainable national development.

Concepts of Science and Technology Education

Science is derived from Latin word “scientia” which means what to know, what is a fact, truth or certain. Science is a body of knowledge and process studied for the possibilities it offers for the development and advancement of technology. It is a way of

providing explanation for certain events, occurrences and phenomena in nature using acceptable laws, principles and practices (Besmart-Digbori, 2008). Science is the branch of knowledge that is empirically acquired through observation, experiments or tests and logical analysis. According to Onah (2003), “Science is the bedrock upon which any nation can be built”. This implies that the building and development of a nation is based on science and without science no nation can advance. Science is an act of doing and is concerned with various investigative processes and activities with regards to developing, acquiring and controlling knowledge, skills, capacity and attitude about the natural factors of the environment (Mbajiorgu, 2003).

Technology is derived from Greek word “techne” and the Latin word “technicus”. These two terms mean “art” or “craft”. The Greek word “techne” was generally used to designate “a bag of tools” and was later responsible for the general definition by many people that technology is the study or mastery of the use of tools in the manufacturing and industrial sectors (Grace, 2010:P148).

Technology can be defined “as a systematic and scientific application of practical skills and the theoretical knowledge to solve problems, particularly those problems that can hinder scientific development”. A good technology must have the following qualities.

- It must be relevant to the needs and aspirations of the nation.
- It must be relevant to the peculiar culture i.e. local content.
- It must be practicable.
- Technology must be scientific.
- It must be efficient.

Science and technology education is recognized globally as the bedrock of civilization and development. It is the application of scientific and technological knowledge in creating or using tools, techniques, resources and processes to harness human and natural environment for the purpose of individual well-being and societal development.

Science and Technology Education for Sustainable National Development

Science education as described by Pember and Humbe (2009) is the process of teaching or training especially, in schools to improve one’s knowledge about environment and to develop one’s skill of systematic inquiry as well as natural attitudinal characteristics. Also, technology education which is the systematic and scientific application of practical skills and theoretical knowledge in solving problems are no doubt the instrumentalities needed for sustainable national development. A sound and affordable education in science and technology for Nigerian child can also mean

better things for the society by helping the child to develop those skills and knowledge that would make him/her a responsible citizen who would help build a strong economy, promote healthier environment and sustain national development.

Science and technology is fast replacing natural endowment as means of wealth creation as demonstrated by countries like Japan, South Korea, Taiwan, etc. These countries have become economic giants of the world today through the industrial technology they embraced. It is therefore important, for Nigeria to improve her science and technology education in order to meet with modern development trend and rank among economic giants of the world. In recognition of the vital role of science and technology in global phenomenon, Nigeria government has embedded it in her national policy on education (2004) as an instrument par excellence for effecting national development.

National Policy on Science and Technology Education

The aims of science are as follow:

- i. To inculcate a positive attitude towards science in Nigerian youths.
- ii. To provide Nigerians who can man the nation's economy, like taking care of the nation's mines, factories, etc.
- iii. To ensure a sound foundation of the basic principles and facts of the society as scientists and technologists.
- iv. To ensure that every person has such a grasp of science as to be ready to co-operate with understanding in the application of science to man's needs.

Challenges of Science and Technology Education in Nigeria

The effective implementation of science and technology education (STE) in Nigeria towards sustainable national development is not without some hitches. The nation present approach to education has failed to encourage individual initiative and efforts through research and development of ideas into concrete problem solving devices for which STE is known. Some critical areas of STE challenges include:

Funding

The success of any educational policy and programme depends largely on funding. Inadequate funding hinders the provision of sound and qualitative education while adequate funding facilitates quality education, provision of infrastructure, recruitment of qualified manpower, mitigates strike actions and enhances good working environment.

Lack of Instructional Materials

The instructional materials such as equipped workshops, libraries and laboratories needed by the teacher to explain the lessons for easy understanding by the students are grossly inadequate. Efang (2005) maintains that the availability and use of instructional materials have significant effect on the performance of the learner.

Attitude Towards Science and Technology

Many of our students have a negative attitude towards science subjects and they believe that science subjects are very difficult especially mathematics, physics and chemistry. The wrong attitude has negative effect on science and technology education in Nigeria.

Teachers' Attitude

Some teachers tend to be so conservative in their approach to teaching. They find it difficult to adopt new approaches in teaching their subject matter. Some are not committed and thereby discourage their students.

Inadequate Teachers

Science and technology teachers are generally in short supply in Nigerian education system.

Large Class Size

The ratio of teacher: pupil is a big challenge to science and technology education in Nigeria. According to the Federal Republic of Nigeria (2004), the teacher: pupil ratio should be 1:35 but this is contrary to what is observed in Nigerian schools today.

Poor Remuneration

Science and technology teachers are not adequately remunerated compared to their inputs in education.

Politics of Education

Most Nigerian politicians play prank with education. They pay lip service to education especially science and technology education.

Prospects of Science and Technology Education in Nigeria

In spite of the enormous challenges confronting science and technology education in Nigeria, there are great prospects for science and technology education in advancing the nation. Some of the efforts put in place for the enhancement of STE for national development include:

- ✓ The introduction of science fairs and clubs in schools.
- ✓ The introduction of junior engineers and technician scientists (JETS) competitions in schools.
- ✓ The establishment of special science and technical schools in the federation.
- ✓ The use of quota for admission and accreditation of courses into Nigerian universities and polytechnics as sixty percent (60%) for sciences and forty percent (40%) for Arts and Seventy percent (70%) sciences and Thirty percent (30%) for Arts respectively.
- ✓ The award of scholarships to deserving students studying science and technology subjects.
- ✓ Establishment of Polytechnics and Technical colleges in Nigeria.
- ✓ The establishment and implementation of the Industrial Training Fund (ITF) scheme.
- ✓ The organization and sponsoring of science and technology conferences, workshops and seminars to encourage science and technology education.
- ✓ The introduction of computer education in schools.

Conclusion

The development of science and technology education in Nigeria potends a great value for the nation because STE is the major tool needed for Nigeria's development. STE if properly implemented will accelerate the rapid social, economic, political and cultural development needed as a nation to be among the developed nations of the world. Science and technology education is believed to be the bedrock for sustainable national development that Nigeria need. It is hoped that with the tackling of the identified challenges facing STE, sustainable national development will be attained in Nigeria.

Recommendations

- Public and private partnership should be encouraged to develop STE.
- Research and Development Institutes should be adequately funded to promote researches in science and technology education.
- National policies on science and technology education should be implemented effectively.
- STE curriculum should be reviewed periodically.
- Local content STE should be promoted.
- Manpower development and re-training should be sustained.
- Regulatory bodies should be well supported.
- Government should provide the enabling environment for STE to thrive.
- Affordable and qualitative STE should be provided for Nigerians.
- Adequate funding should be encouraged.

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