

## Science and Technology Education for Sustainable Development

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### Abstract

Science and technology in any country is an essential requirement for a strong economy and sustainable development. The countries having strong and meritable science and technology institutions are indeed the advanced countries in the world and their people enjoy a high standard of living. Furthermore, it is important to continue such advancement. The sustainability of the science and technology institutions is insured by effective planning by the teachers and students of science and technology education and the government as well. This paper therefore focuses on the importance of science and technology education in the growth and development of the nation, challenged facing science and technology education from the attainment of sustainable development in the country. Conclusion and recommendation were propounded which include. All stake holders in science and technology education from policy makers to implementers including parents must have input in technology education for sustainable development in the country.

**Key words:** Education, Science, Technology, Sustainable development.

### Introduction

For any nation to attain sustainable development, there is need to recognize science education as a priority area of education for her citizens Jimith(2013). Science is derived from a Latin word 'scientia' which means what is to know what is a fact, truth or certain. Science according to Otivet(2013) is the bedrock upon which any nation can be built. This means that no country can be globally recognized without talking about a scientific advancement. Science is an act of doing and is more concerned with various investigative processes and activities with regard to developing, acquiring and controlling knowledge, skill, capacity and attitude about the natural factors of the environment. Meky(2012). This implies that science education is described as a process of teaching or training especially in school to improve ones' knowledge about environment and to develop ones' capacity by systematic inquiry as well as natural attitudinal characteristics (Denyut 2013). Science education has been recognized worldwide as a prerequisite in technological development. Science education involves the study of science in depth and in addition, educational knowledge and concepts are learned and verified. No country can be globally recognized without talking about its scientific advancements. Science education according to Alam(2014) identifies natural phenomena appropriate to child interest and skills. Science education also equips teachers and learners and the society at large with knowledge, skills, equipment and freedom to perform noble tasks useful for improving socio-economic standard and sustainable development.

Science education courses are designed to produce capable scientists who contribute meaningfully to academic excellence of the society to raise the economic level and sustainable development of the nation. Science and technology can be used to attain sustainable development. A better education in science and technology for the citizens can bring better things for the society by assisting individuals to develop into more responsible citizens who will help to build a strong economy, contribute to a healthier environment and bring about a brighter future for everyone and fast development. The more science and technology literate individuals are, the stronger their society can be developed, specifically the lessons and skills science and technology gives us. It can have effects and more responsible citizens, a strong economy, a healthier environment and a brighter future for every individual in the country.

Our societies and nations at large are dominated and even driven by ideas and products from science and technology and it is very likely that the influence of science and technology education on our lives will

continue to increase in the years to come. Scientific and technological knowledge, skills and artefacts invade all realms of life in modern society(Hallalac 2014).

The workplace and the public sphere are increasingly dependent on new as well as upon more established technologies. Science and technology education is very crucial for our actions and decisions as workers, students, as consumers and so on.

Modern societies need people with scientific and technological qualifications at the highest level of education as well as a general public which has a broad understanding of the contents and methods of science and technology education, coupled with the insight into their role as social forces that shape the future.

Science and technology education is the major cultural products of human history and all citizens, independently of their occupational needs should be acquainted with them as elements of human culture (Irwin 2013). Science and technology education is obviously important for economic growth and development of any nation. One might expect the increasing significance of science and technology education to be accompanied by a parallel growth in interest in these subjects and in an understanding of basic scientific ideas and ways of thinking. (Thompson2014). This does however, not seem to be the case, especially in the more developed countries like Europe. The evidence for such claims is in part based on hand facts educational statistics relating to subject choice in schools, enrollment in tertiary education and so on.

### Importance of Science and Technology Education to National Growth and Development of the Nation.

The importance of science and technology education to national growth and development of any nation cannot be over emphasized, the growing importance but increasingly problematic, enrolment in, and status of science and technology in many countries provides the obvious background to a growing concern about science and technology education in schools, higher education, media and the public (Michael 2012). science and technology will not be possible without science education. Science and technology education is the key driver to national growth and development of any nation because technological and scientific revolutions underpin economic advances, improvement in health systems, education and infrastructure.

National growth and development in science education is the fundamentally altering the way people live, connect, communicate and transact with profound effects on economic development to promote technological advancement, growth and development of any country, developing countries should invest in quality education for youth and continuous skill training for workers and students.

The science and technological revolution of the 21<sup>st</sup> century are emerging from entirely new sectors, based on microprocessors, telecommunications, bio-technology and Nano technology products are transforming national growth and development across the world, as well as the lives of all who have access to their effects. The most remarkable breakthrough growth and development come from the interaction of insights and applications arising when these technologies converge.

Through the breakthrough of science and technology in health services and education, have power to better the lives of poor people in developing countries. Access and application of technological equipment's are critical service and differentiators between countries that are able to tackle poverty effectively by growing and developing their economies and those that are not. The extent to which developing economies emerged as economic power house depends on their ability to grab and apply insights from science and technology and use them creatively. Innovation is the primary driver of technological growth and development as well as driver of higher living standard(Anthony 2013). It's an engine of national growth and development. The potential of technology is endless and still largely untapped in Africa and other developing countries of the world. To promote national growth and development, there should be technological advancements. Developing countries should invest in quality education for youth and continuous skill training for workers and managers should ensure that knowledge is shared as widely as possible across the societies and country at large.

Science and technology is very important in the growth and development of any nation, that is why every nation must take it very serious in all institutions of learning. Many of the developed worlds were able to achieve so much in science and technology because of science education. For instance, Russian government wouldn't have been able to achieve much in science and technology if not for the position they placed physics in science education (Pavkor2013).

Without science education, information and communication technology would be impossible. Science and technology will not be possible without science education. (Arin 2012). For instance, engineering, medicine, architecture, etc. will not be possible if there is no one to teach the students the core subjects needed for these courses.

#### Challenges Facing Science and Technology Education in the Attainment of Sustainable Development in the Country.

Science and technology education is the field concerned with sharing scientific knowledge and methods with people not traditionally considered part of the scientific community. Science and technology education should be able to transform the typical teacher centered classroom lecture into a discovery and problem solving area. This encourages creativity and originality (Gofwen 2012). Sustainable development is actually a very broad concept to define because it is continuously evolving. It tends to investigate and emphasize the development of the present without compromising the future of the upcoming generations (Henry 2013). Sustainable national development can be seen as the process of improving the range of opportunities that will enable people to achieve their aspirations and full potential over a given period of time while maintaining the resilience of economic, social and environmental systems. Basically, it is a knowledge base which revolves round three basic concepts which are the economy, the environment and the society (Cosmas 2013).

Many countries of the world have embraced the need for education to achieve sustainable development, though, lack of vision and awareness has impeded progress in Nigeria, and this can be partially attributed to lack of planning, proper supervision and implementation of well-designed policies (Mhiz 2012). Addressing the above mentioned critical issues, the Nigerian government can prevent or reduce delays or derailment of sustainable development projects and ultimately attain sustainability. For any nation to achieve this, especially Nigeria, the relevant focal points for sustainable development must be identified and addressed.

There are key challenges that must be addressed in order to attain a sustainable development in the country. One of the challenges facing science and technology education in the attainment of sustainable development is in the area of basic education in the country. Different countries have varying definitions for basic education in the country. For some, the ability to read and write is defined as basic education, while some have to complete a particular class or obtain a type of certificate to qualify as having a basic education. However, in many countries of the world, the current level of basic education is too low, thereby severely hindering national plans for a sustainable development in future (Dawam 2012). In Nigeria, basic education comprises both the range of formal schooling as well as wide variety of non-formal and formal public and private educational activities offered to meet the learning needs of groups of people of all ages. Science and technology teachers are the key factors to be considered when talking about the attainment of sustainable development of any country. There are shortage of qualified science and technology teachers in Nigerian schools. The so called science and technology teachers are not professionally qualified (Frank 2013). They may have the knowledge of the subject but lack the method on the study of teaching primary science or basic technology in school. Attitude of many teachers is also a challenge towards technology education. They have been teaching for many years without upgrading their certificate by going for in-service training. This affects their output and it is a problem to the development of science and technology education and sustainable development of the nation.

Methods of teaching by science and technology teachers is also a significant challenge in the attainment of sustainable development. Many science and technology teachers still hold to chalk and talk method of teaching which is not appropriate for science and technology teaching in this dispensation. In many countries of the world, the recruitment to scientific and technological studies is falling, or at least not developing as fast as expected or planned for. This lack of interest in science often manifests itself at school level at the age where curricular choices are made. In some countries like Nigeria, there is a

noticeable decrease in the numbers of students choosing some of the sciences (Sati 2012). This trend is consolidated in admission to tertiary education. A similar trend occurs in some areas of engineering and technology studies. It should however be noted that there are large and interesting differences between the various European countries and between the different disciplines within science and technology. The fall in recruitment has been particularly marked in physics and mathematics which is a challenge in the attainment of development in the country.

Gender gap in the choice of scientific and technological subjects at both school and tertiary level pose a challenge in the attainment of development in the country. Many countries have had a long periodically steady growth in female participation in traditionally male fields of study, but this positive trend seems now to have been broken in some countries (Elviz 2013).

#### Conclusion

Many challenges abound when it comes to science and technology education for sustainable development. Good quality of science and technology education is essential in achieving the level of economic growth and development and to tackle poverty and make sustainable development. Science and technology education has made life a lot easier and also better especially in the advancement of information and communication aspect of development. In spite of the advancement in almost all sectors, still implications of science and technology education make a major difference in all areas of development. Without proper implementation of science and technology education, no nation could grow and all those nations under developed technologically will remain in the lowest ladder of development. Therefore, the future of any nation for sustainable development depend more on the implementation of science and technology education in the country.

#### Recommendations

Since science and technology education is the part of the national strategy for sustainable 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 interpretation of science and technology education by policy makers as well as the implementers of policies in science and technology education. In view of these, the following recommendations were made:

- New policies should be made to clarify the importance of science and technology education in the country
- The requirements (Human, Material, Economic) in various sectors of society on the benefits of science and technology education should be addressed.
- Government should demonstrate clearly her political interest in working to rebuild the country's economy through science and technology education
- The government of the country should make science and technology education a priority in its broad national development strategy.
- Science and technology education should be supported by foundations, business, NGO's and international development agencies.
- The gaps between science, technology and the public should be bridged.
- Government should encourage and support the establishment and development of professionals of science and technology education and organization especially teacher organization nationwide.
- There should be effective and adequate monitoring of educational practices through planning stage to implementation stage of science and technology education in schools.

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