

## SCIENTIFIC AND TECHNOLOGICAL LITERACY IN AFRICA: ISSUES, PROBLEMS AND PROSPECTS' DIMENSIONS (IPP)

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### ABSTRACT

*This paper examined the scientific and technological literacy in Africa with special focus on issues, problems and prospects dimensions. It delved into scientific literacy, technological literacy and education in Africa. It highlighted some factors that militate against scientific and technological literacy in Africa. The paper discussed the basic requirements for sustainable scientific and technological literacy advancement in Africa. Hence, conclusions and recommendations were made.*

**Keywords:** Scientific, Technological, Literacy, Issues, Problems, Prospects

### INTRODUCTION

Africa is often regarded as one of the underdeveloped continents in the world. This is compounded by the clutches of poverty ravaging the continent. Could not this phenomenon be attributed to the absence of scientific and technological development in the continent? Is there sufficient literacy in Africa to foot this need for scientific and technological development? Oguniyi (1986) defined scientific and technological literacy as an aspect of cultural literacy which entails a functional understanding of the nature of science and technology. He contended that in the conditions of modern life, a scientifically/technologically illiterate person is considerably circumscribed in playing his full potential in the socio-economic development of his community.

Corroborating the ideas enunciated above, Champagn and Lovitts (1989) were of the opinion that a scientifically/technologically illiterate person is forced to live a marginal existence and is vulnerable to exploitation by others to the extent that he is not able to achieve his liberation and self-actualization. Nwagbo (1999) further defined scientific literacy as the use of scientific knowledge acquired by an individual to solve personal and civic problems confronting him in the society. Research reports on the level of scientific and technology literacy revealed that it was very low (Bajah, 1983; Ali, 1986).

However, the developed nations of the world started by building a very strong and virile scientific base upon which all other things are built. To this end, pre-eminence was accorded science in their school curriculum and students were introduced to scientific concepts at a very early age. The invention of the internet popularly known as the information super-high way has turned the whole world into a global village. Other advancement in technology like the office automation, teleconferencing, e-mail and voice mail etc have made a significant impact in our lives. These are products of scientific and technological literacy and Africa must not be left out.

With these precursors, it becomes obvious that no nation or continent in the world can attain scientific and technological advancement without a sound and vibrant scientific

and technological education. Hence, this paper seeks to identify the issues, problems and prospects of scientific/technological literacy in Africa with a view to proffer solutions.

## ISSUES

It is pertinent to note that scientific and technological literacy do not grow from the blues: there are practical ways to grow scientific and technological literacy. The major issues are manpower development, an efficient curriculum design, distance learning programmes, public enlightenment campaign and finance.

The greatest resources a country can have are human capital and natural resources. These resources are inherent in Africa. Our major problem is how to harness these resources for our development. Nnaji (1993) argued that one of the reasons for the west not investing in Africa is the lack of elevated skilled manpower which we are neglecting. He is of the opinion that high skilled manpower requires training. The conclusion that can be drawn from the above assertion is that our methods of training manpower must be rigorously overhauled in order to obtain better results. Biebeman (1996) also observed that every country needs efficient and well trained workers.

Furthermore, an efficient curriculum design is a 'sine qua non' for a viable scientific and technological literacy in Africa. The scientific and technological education curriculum should be structured in a way as to serve as a catalyst to the social, economical and political advancement of the continent bearing in mind that the objectives and philosophy of science and technology are achieved within a short period of time.

However, a high percentage of Africans are illiterates and one of the ways of increasing the literacy rate is to encourage distant learning which will accommodate drop-out citizens; citizens who want to enhance their educational background, citizens who lack formal education and those who require in-service training. This could be achieved through correspondence for distance students and the formal setting of receiving lectures after office hours and weekends.

Invariably, there is need to create public awareness on the importance of scientific and technological literacy for the development of the individual, nations and the whole continent. This can be achieved through the provision of information incentives such as leaflets, media, seminars, workshops and conferences etc.

The issue of adequate finance for scientific and technological literacy in Africa cannot be over emphasized. It is paramount to any concerned government of the day. This will allow them excel in scientific and technological development.

## PROBLEMS

Adeniyi (2002) said, a lot of contending factors militate against the rapid development of scientific and technological advancement in Africa. Some of these factors have been identified by researchers and scholars (Ihechere, 1997; Gayus, 1996; Oladepo, 1997). Among the problems are poverty, depressed economy, inflation, military intervention, lack of project continuity and poor implementation of programmes.

The African continent has been impoverished over the years, Average income per capita is in a dilemma since inception of economic problems confronting the continent. The implication of the capitalist theory calls for the inequality in economic distribution. This, however, makes the rich to get richer while the poor get poorer. This poses a very

difficult situation for parents who would be happy to have their wards in schools but cannot afford the basic requirements like books, writing materials etc.

Majority of Africans are illiterates and ignorant of the various opportunities opened to them in the field of science and technology and as such opt for other disciplines like the liberal arts.

Furthermore, the world has been experiencing a depressed economy, though it has been so prominent on the African economy. As a result, the government now finds it extremely difficult to carry out her responsibilities to her citizenry. She also finds it difficult to provide necessary infrastructural facilities needed to enhance effective teaching and learning of science and technology.

In terms of inflation, continuous hike in the price of essential scientific and technological books and other infrastructural facilities has mitigated against the study of science and technology especially in the African continent. These essential books and facilities have gone beyond the reach of the common man.

Another major problem of scientific and technological literacy in Africa is the long persistent years of the military intervention in the governance process perpetuated in Africa. This retarded the educational pace of most African countries especially in the domain of science and technology. Education was not given priority and the budgetary allocation to it diverted to other sectors of the economy. This necessitated the prevalent lack of project continuity in most African countries. As a result of the frequent coups, changes in government and assassinations have resulted in discontinuity of projects by incoming government.

African leaders are known to formulate very good and wonderful policies, but with poor implementation. The implementation stage of every programme is the most sensitive aspect which needs to be handled thoroughly and carefully in order to achieve the set objectives. With these impediments, science and technology grind to a slow pace in Africa.

## **PROSPECTS**

It is evident that Nigeria and Africa as a whole lag behind in preparing her workforce for the challenges of the rapidly changing global economy. For that the continent of Africa must invest copiously in scientific aspect and technological literacy programmes. Since, no nation would make any meaningful socio-economic stride without a viable scientific and technological programme; investment in this sector has become a "sine qua non".

The United Nations Education, Scientific and Cultural organization (UNESCO) has noted that revitalizing this sector is among the ways to improve economic opportunities for the youths. Furthermore, the 1991 policy of the World Bank harped on the development of a skilled labour force which makes an important contribution to development.

Ojimba (2012) harped that private and public training capacities powered by science and technology help to develop economies of countries especially the underdeveloped ones. Hence, Africa can be increasingly influenced by scientific and technological change and open to international competition. Furthermore, training in the private sector by private employers and in private training institutions can be the most effective and efficient way to develop the skills of the work force; hence enhancing scientific and technological literacy in Africa.

## CONCLUSION

Science and technological literacy in Africa, issues, problems and prospects dimensions have been critically analyzed above. One major issue is that science and technology are the backbone to any scientific and technological advancement in any part of the world. It is imperative in Africa that before any notable and standard advancement in scientific and technological literacy can be recorded; these issues and problems enunciated above must be critically examined. If these prospects are examined and imbibed by African nations, then we are in the route to scientific and technological literacy.

## RECOMMENDATIONS

A strong and sound scientific base is very essential to the African continent and any nation in particular. In this regard, the government of the various countries should, as a matter of urgency ensure that the teaching and learning of science and technological education is paramount in primary and post primary schools. To this end, the government should be able to provide adequate and necessary infrastructures that would enhance the teaching and learning of science and technology education.

Furthermore, Africa has sons and daughters who have distinguished themselves in the field of science and technology and are presently in other continents in search of greener pastures. These people could be motivated in order to keep them in Africa thereby contributing to the scientific and technological advancement of this great continent.

However, it is advisable for African leaders to establish finance, inspect and manage the affairs of various scientific and technological institutions in their domain. These institutes should employ only African scientists who are dedicated to the development and advancement of this great continent. The huge sums of money expended on irrelevant projects should be directed and harnessed to laudable projects and inventions that would make this continent proud.

Incidentally, the admission ratio of 60:40 in favor of science and technology is currently not being implemented in most African nations. Government should enforce this. Since a tree does not make a forest, efforts from individual's governments, donor agencies should be geared towards enhancing, scientific and technological literacy in Africa.

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