

ISSN 1118 - 5481

NIGERIAN
JOURNAL
of
Curriculum
and
Instruction

Volume 10 No.1, December, 2001

SCIENCE EDUCATION AND NATION BUILDING: CURRICULUM IMPLICATIONS

Fidelis A. Onwioduokit (Ph. D)

Abstract

This paper discussed the curriculum implications of Science Education in nation building. It has been observed that many attempts have been made to develop Science Curricula at the Primary and Secondary levels but hardly any significant restructuring and redesigning has been carried out at the tertiary levels to portray the much needed national development. Even at Primary and Secondary levels where much has been done, there still exist some gaps between the curriculum and the local environment of the learner. The paper also considered the insufficient teaching and infrastructural facilities as well as poor training of science teachers, who are the operators of the curriculum, as areas to be grappled with to enable Science Education enhance nation building.

Introduction

Education, simply stating, is a process, an activity or experience, which brings about the required changes in the behaviour of the learner. In other words, while it could be true that one could be learned without being educated, one cannot be said to be educated who has learnt nothing. Learning that does not culminate in a change in behaviour is considered worthless and cannot produce an educated man (Akinpelu, 1981).

On the other hand, science is a body of knowledge about nature and natural events that have been systematically and objectively acquired and made subject to further scientific probing. Science Education, therefore, is concerned with the changes in learners' behaviour as a result of exposure to the knowledge and principles of nature and natural events. It focuses on developing scientific literacy in the citizenry as well as developing in individuals scientific knowledge and skills that can be directly or indirectly utilized for the development of the society. In this conception, science education is recognized as a discipline, a field of study.

The second conception of science education comprises all subjects in the faculty of science as well as science education. This paper incorporates the two conceptions. The focus of this paper is to discuss the role of science education in nation building. The paper also addresses curriculum issues, quality of science teachers and materials as they affect nation building.

Role Of Science Education In Nation Building

The term 'Nation Building' suggests that nation is undergoing development stages. It is indeed, under construction. The crucial areas of development include economic, agricultural, industrial and technological, health, human and mineral resources, politics and education. Of all these, education holds the key to national development.

As stated in the National Policy on Education (NPE 1981), the Federal Government of Nigeria has adopted education as an instrument par excellence for effecting national development. The five main national objectives of Nigeria as stated in the Second National Development Plan and endorsed as the necessary foundation for the National Policy on Education are the building of:

- (i) A free and democratic society;
- (ii) A just and egalitarian society;
- (iii) A united, strong and self-reliant nation;
- (iv) A land of bright and full of opportunities for all citizens and;
- (v) A great and dynamic economy.

These national objectives indicate the desired directions for nation building. Considering these, science education has a crucial role. Denga (1997) considers Science Education as:

A gate-way to industrial development, a fulcrum on which technological development pivots. The national socio-economic, political and industrial development hinges on the scientific status of the nation.

Implications Of The Link Between Science Education And Nation Building

Discovering the role of Science Education in nation building has certain implications to:

- a. Curriculum development.
- b. Provision of teaching material and infrastructural facilities.
- c. Teachers' training and methods of instruction.

(a) Curriculum Implications

As far back as 1982, Alonge (1982) commented on the State of Science Education Curriculum in Nigeria indicating that:

- (i) The content of science taught seems void of the local environment;
- (ii) The successful products of science education or education in science do not generally identify with the technological needs of the society; and
- (iii) The pride of science as an enjoyable creative and humanizing enterprise laden with discoveries and things yet to be discovered seems dented as the curriculum cannot bring this to bear.

Since after these observations, many attempts have been made by various curriculum development bodies and agencies to improve the quality of Science Education Curriculum. Foremost among these has been the Science Teachers' Association of Nigeria (STAN), established in 1957. As viewed by Ogunleye (1999), the efforts of STAN at enhancing science education in Nigeria can be categorized into four areas as follows:

- (i) Setting goals and objectives for science education;
- (ii) Determination of subject matter content;
- (iii) Assessment of learning outcomes; and
- (iv) Production of learning materials.

STAN has published many textbooks, position papers and journals on various issues and levels of Science and Mathematics Education.

Other bodies that have made significant impact on science curriculum development include West African Examinations Council (WAEC), established in 1953; the Comparative Education Study and Adaptation Centre (CESAC) – established in 1968; Nigerian Educational Research Council (NERC), established in 1971; the Nigerian Educational Research and Development Council (NERDC), formed in 1988 by merging CESAC and NERC.

In spite of the various attempts made to improve the quality of Science Education to bear upon national development, nine (9) years after Alonge's remarks, African Development Bank Groups (1991) carried out a study as quoted by Onwioduokit and Efut (2000) to discover that curriculum and instruction in African schools (including Nigeria) still reflect a good deal of colonial orientation. It is therefore pertinent to observe that:

- (i) Though much work has been done in the area of Science Curriculum development, much more work is still yet to be done. There has not been a breakthrough yet.
- (ii) The immediate environment of the Nigerian child is still not fully captured and integrated into the curriculum.
- (iii) The rigidity of examination syllabus and questions have not allowed for adequate reflection on the local environment.
- (iv) The various curriculum reforms in Science have only been done at the primary and secondary levels. Institutions of higher learning will need to work on and re-design their programmes in order to produce the needed man power in Science and Technology required for nation building.

(b) Teaching Materials And Infrastructural Facilities

Besides the curriculum, the provision of materials and facilities for science teaching at all levels of education is crucial if science education most positively influence nation building. Contrary to expectations, there has not been any significant breakthrough in the provision of science equipment to schools, in spite of all emphasis and policy statement. African Development Bank Group (1991) research showed that teaching materials have reflected a similar pattern as the curriculum and that the provision is still grossly inadequate.

For instance, much has been said about primary science as the foundation upon which further science learning is built (Onwioduokit, 1995). But it is disheartening to note that materials for primary teaching are not available in public schools, not to mention the availability of a laboratory. This is not peculiar to public primary schools. Public secondary schools and higher institutions of learning have a similar experience. There are some secondary schools whose students will only carry out practical work a day or two to the Senior Secondary Certificate Examination (SSCE) with borrowed equipment, through out their 6-years stay in the school. It is obvious that such hasty arrangement cannot inculcate scientific skills and attitude expected from involvement in practical works. Students may end up passing the examination but cannot be meaningfully involved in nation building.

It should be noted that besides the inculcation of laboratory skills, practical work in science is expected to acquaint the learner with science processes as well as debunk some traditional cosmological ideas, which are inimical to national development.

Akin to the problem of insufficient science materials for teaching is the fact that scarce materials are only used for stereotype experiments. Immediate needs and problems of the society are not addressed even at the University level. It suffices it therefore to say that for science education in Nigeria to bear upon nation building;

- (i) Sufficient materials and infrastructural facilities should be provided in schools at all levels.
- (ii) The current move to introduced Universal Basic Education (UBE) should fully incorporate the provision of laboratories and science equipment in primary and secondary schools.
- (iii) Practical work should be made to take into consideration the societal, industrial and technological needs of the nation.

(c) Teachers Training And Teaching Methods

The present way science teachers are trained leaves much to be desired. A situation where student teachers offered all teaching courses in science facilities and only take method course(s) in their Department is, perhaps not helping the situation. Years of experience with such students clearly shows two things:

- i Students do not understand the concepts involved in the Senior Secondary Curriculum they are expected to teach after graduation. This is often made known during teaching practice sessions.
- ii Most students do not do well in the courses they are taking in the Faculty of Science. High failure rate and poor results abound yearly.

A proper dissection of the aforementioned problems shows a yawning gap between secondary school and university science in most students. This gap could be as the result of the one that had existed between the primary and secondary schools science. And until this gap is bridged there will continue to be a vicious cycle.

In order to break this cycle, it is suggested that Departments, sub-Department and Units of Science Education (as the case may be) should:

- (i) Develop and mount teaching course contents that truly reflect what the students will be teaching after graduation. This could either be incorporated into Science method classes or made a course in itself and is without prejudice to their courses in the Faculty of Science.
- (ii) Micro teaching facilities (which is absent in most Facilities of Education in Nigeria Universities) should be acquired and used in the training of science student teachers.

There has to be a good balance between the knowledge of the study matter and the method of disseminating the knowledge.

Conclusion

Education is seen as a bedrock of national development. Industrial and technological development of a nation therefore pivot around Science Education. It therefore implies that the quality of education provided in science to the citizenry will determine the quality of such development. This paper discussed the curriculum implications of Science Education Programme that is expected to enhance nation building. It is the view of the author that the science curriculum at all levels of education be tailored to adequately reflect local environment and needs. Teaching materials and infrastructural facilities should be provided as well as proper training of science teachers, carried out.

References

- Akinpelu, J.A. (1981). *An Introduction to Philosophy of Education*. London: Macmillan Publishers.
- Alonge, E.I. (1982): The Relevance of Traditional Mathematics in Modern Education: A Quest for Relevant Science in Africa. *Journal of STAN*, 21 (1). 24 – 44.
- Denga, D.I. (1997). Science and Mathematics Education as Key to Nigerian Technological Boom in the 21st century. *Akamkpa Journal of Science and Mathematics Education*, 1(1), 96 – 100.
- Federal Ministry of Education (1981). *National Policy on Education* (revised edition). Lagos: Federal Government Press.
- Ogunleye, A.O. (1999). *Science Education in Nigeria: Historical Development Curriculum Reforms and research*. Lagos: Sunshine Int. Publications (Nig.) Limited.
- Onwioduokit, F.A. and Efut, O.I. (2000): Enriching Physics Education in Nigeria to Cope with Challenges of the Present Millenium. In M.A.G. Akale. (ed.) *Enriching Science, Technology and Mathematics Education*. Ibadan. Heineman Educational Books (Nig.) PLC 305 – 312.
- Onwioduokit, F. A. (1995). Teaching Physics Concepts in Primary Science Modules. *Journal of Research in Education and the Humanities*, 3 (1), 10 – 19.