

AFRREV STECH

An International Journal of Science and Technology
Bahir Dar, Ethiopia

Vol.1 (3) August-December, 2012:126-133

ISSN 2225-8612 (Print)

ISSN 2227-5444 (Online)

**Integration in Science Teaching - Learning: Problems
and Prospects**

Afuwape, M.O., Ph.D.

Faculty of Education
Olabisi Onabanjo University
Ago-Iwoye, Ogun State

E-mail: researchpartners2000@yahoo.com

Abstract

The paper examined the nature, issues and prospects of Basic Science and Technology in Nigeria. It further suggested ways of solving the current emerging problems in the course, some of the further suggested ways of solving the current emerging problems are: Institutions of learning in Nigeria especially schools and faculties of education must accommodate Basic Science and Technology as a course. Recruitment of resource personnel that are grounded in pedagogy and andragogy of Basic Science and Technology is a must. Training and re-training programmes for teachers of Basic Science and Technology is a must-Establishing Institute of Children Science or Basic Science and Technology is a must in Nigeria. Young eagle must fly with the assistance of colleagues, fathers and mothers of science education through a

united, strong and dynamic Basic Science and Technology Teachers' Association. It is this association that will fly the flag of development through teaching, upholding to a slogan "No Development, No Surrender".

Introduction

The entry point to Integration in Science is to view the concept science and science education. According to (Naughton, 1994) Science helps us to understand our world by interpreting the laws and principles that govern it. Science blends logic and imagination to explain and predict events through scientific inquiry. It demands evidence. In the real sense of it, science is the systematic study of natural phenomena; helps us to understand and relate better to nature and the universe at large. The study of science allows students to experience the richness of and excitement of the natural world. As adults, they will face complex questions requiring scientific thinking, reasoning and the ability to make informed decisions. For purposes of clarity and in order to give due emphasis, science is divided into Physical and Information Sciences, and Biological and Health Sciences, Mathematics and Technology.

Integration in Science - Teaching gave rise to Integrated Science, now known as Basic Science and Technology, a school subject defined by UNESCO - UNICEF (1971) as an approach to the teaching and Learning of science in which concepts and principles are presented so as to express the fundamental unity of scientific thoughts and avoid premature or undue stress on the distinctions between the various scientific fields".

Science plays an important role in human life; the efficacy of science in the provision of domestic needs, security, materials and social amenities cannot be over emphasized. This is an indicator to why science education should be taken very seriously with all it requires for development efforts of a nation. Thus, Nigeria as a developing country will have something to show for developments, not importing almost everything needed while existing manufacturing industries and establishment's go into extinction now and again.

Integration is a universal phenomenon prominent in science than other fields of studies for obvious reasons: in the first place, when applied to science teaching and learning, the word integrated means that the concept of the fundamental unity of science; the commonality of approach to problems of scientific nature' and are helped to gain an understanding of the role and

functions of science in everyday life and the world in which they live (D' Arbon 1972).

In line with the view of D' Arbon, Gang, (2010) postulated that there is a need to emphasize the integration of advance technology and education, which are the ideas and theories of the educational development in the new century, and it is important that teachers integrate technology into their lesson, since this experience is essence of modern education. Technology in the classroom can facilitate individuals of different cognitive ability to share common knowledge and forms a new feasible foundation for quality education.

Integration is relevant to pupils and students need and experiences; stresses the fundamental unity of science; lays adequate foundations for subsequent specialist study; and add a cultural dimension of science education.

Integration; a weapon for understanding science, has come to embrace and propel science to the grass root through Basic Science and Technology.

Issues on basic science and technology (BST)

Basic Science and Technology Education; where science takes shape, is confronted with series of issues. Good enough, it is still a subject to be taken at the first nine years of formal setting in Nigeria but at two levels. Basic one to three will offer the subject as Basic Science and Technology, while, Basic four to six, offers it as Basic Science and Basic Technology.

The same thing goes for Basic seven to nine. At this juncture, this paper cannot but to be grateful to National Council of Education for this new nomenclature (Integrated Science to Basic Science and Technology). However, the challenge of updating the "Resource Educators" is necessary for the government, if the subject(s) will be handled well. This new position of the National Council of Education in Nigeria is strengthened by

American National Research Council (2002) points out that rethinking and assessing curriculum, teaching, assessment and teachers' specially development depends on whether they facilitate understanding study and whether they agree with the Seven Principles of Learning with understanding put forth in the 1990s. In according with the Seven, Principles, curriculum design features "Structured learning activities that, in a real or simulated fashion, allow students

to experience problem solving and inquiry in situations that are drawn from their personal experiences and real-world application” {National Research Council, 2002}

Teaching design and implementation need to "recognizes students" preferences for and varying abilities to process different symbol systems, such as language (written and spoken), images, and numerical representations, by employing multiple representations during instruction. Structured learning environments in which students can work collaboratively to gain experience in using the ways of thinking and speaking used by experts in the discipline" (National Research Council, 2002).

It is not out of content to relay the fact that Basic Science and Technology is to introduce young learners to science during the first nine years of formal setting in Nigeria, but in a situation where students are not studying. Science at Senior Secondary, it should be proper for them to continue with Junior Secondary Basic Science and Basic Technology at advance level i.e integration at advance stage instead of short changing them to do one compulsory single science subject that negate the purpose of integration in their life. The students should build on the J.S Basic Science and Basic Technology for enriched reality of change acquaintance and with world of performances. Consequently, Senior Secondary School non-science students should continue with Basic Science and Basic Technology instead of compulsory single science subject. The one science subject could be rather a narrow choice. Where a student wishes to do one compulsory single science subject we will recommend Basic Science and Basic Technology and where three science subjects are required for placement,

Basic Science and Basic Technology should be taken as a replacement for one when two are passed.

Taking a look at institutions offering Basic Science and Basic Technology in Nigeria as discussed in Afuwape (2006) "Integrated Science from 1960s - 2005 in Nigeria; which way to go? One will think, science has gained ground at grass root level. Again, Science and Technology should have turned the country into a full blown development but situational reports negate this assertion to an extent that up till now, majority of institutions offering Basic Science and Basic Technology are still referring to it officially as Integrated Science. Possibly, this type of error allowed for some schools, individuals and establishments to still be mentioning primary science that has no provision in the National Policy on Education.

What about students graduating from Secondary School and Colleges? Hardly would any higher institution i.e. universities record a good number of students coming in at a particular year to study Basic Science and Basic Technology. This could raise question of "Teaching Effectiveness and Attitudinal enhancement" during course of study in these institutions. Why should students not be coming to university to study the course "Basic Science and Basic Technology" while talking of development! It is absolutely zero. Graduate of Basic Science & Technology Education are tomorrow's Curriculum Developers, Science Educators (BST), Developmental Psychologists (pedagogy & Andragogy), Administrators of Establishments i.e Education and other Social Institutions, Researchers in Science Education e.t.c. It should not be forgotten that development of a nation is measured through science and technology. The politicians' account of achievement is majorly in the area of Science and Technology i.e construction of road, building of houses for the masses e.t.c. It could now be concluded that without Basic Science and Basic Technology there is no development, no wonder Afuwape and Aanu (2010) affirmed in Erinsho (2004) that for science to meaningfully impact on development, a new approach in science education that is incorporate the fundamental principles and concepts that are rooted in the traditional cultural

Environment, daily experience and resources within the communities is necessary. Reflection of this in teacher of Basic Science and Technology (BST) is a big challenge that should propagate development through teaching using the coercive BST Teacher slogan of **"NO DEVELOPMENT, NO SURRENDER"**. It should be noted that poor development in Africa especially Nigeria prompted the curriculum review that brought about inauguration of Aiyetoro Comprehensive High School Basic Science for the first two lower forms, where material developed served as reference point for the 1968 National Educational Research and Development Council (NERDC). Thus, failure of Nigeria to develop is the responsibility of Basic Science and Basic Technology teachers. It should be proper to say that machineries to achieve this aim must be put in motion. If not, the nations unemployment problems will persist for life and poor economic complexities will remain until the grassroots causal agent is trashed out by supporting and encouraging the teaching and learning of Basic Science and Technology in Nigeria, the Foundation subject of all the Sciences, a dear need for national development. I make bold to say, it is not too late to wake up from our slumber. And as a matter of urgency "with due respect" all professors of

“Basic Science and Technology” are presently challenged. I think it should be irrational if other professors are not involved; the issue of previous knowledge and entry behaviour is fundamental in education and Basic Science and Technology precede the field of science. It thus means that others in the field of science cannot but to partake in the development of Basic Science and Technology for a meaningful performance in any line/unit of endeavour. If by now the nation is worried and concerned with the issue of development, we should have proposed Institute for Children Science or Basic Science and Technology Education in the country. If not, now is the time for us to achieve it.

Earlier on, (Bajah, 1995) had recommended the need to review the science teacher-training curriculum to reflect the demand for an up-dated thinking and performance of a modern teacher. At primary level the curriculum should lay more emphasis on foundation building: creating awareness and interest in science. This will entail helping pupils to answer basic questions and explanations about what nature/matter is, what happens in everyday life experiences etc.

At secondary school level the curriculum should focus on further clarifications and explorations of natural phenomena. Learning by inquiry, observation and experimentation should be encouraged to help students explore the natural and manmade worlds. The students should be guided in the identification and application of laws and principles of the scientific world.

Consequently, fathers and mothers of science education, planning, executing, guiding and leading for Basic Science and Technology to achieve the set down goals in your responsibility and now is the time.

The other important issue is the housing of Basic Science and Technology as a course or subject in our institutions. It must be an aberration, a disaster for any school/faculty of education not to accommodate the subject/course “Basic Science and Technology” an entity that focuses on the development of our society (Nigeria) as provided in the National Policy on Education. It’s like a house without foundation. Consequently, it is a challenge that must quickly be met, not considering what it will cost.

In addition, today’s research in BST is a challenge. Japan and America take interest in children science for concrete optional, optimal and proximal development not researching common issues of no significance.

Objectivity leads to achievement, Roburion (1998) in Hess (1970) and Bernstein (1971, 1973) obtained deareviance of conducive interactive strategies and their implementation; Bruner, Jolly and Jylva (1976) introduced the idea of "formats" and the role of "scaffolding" within which children scientific objectives are fulfilled.

These international recommendations are worthy of emulation, not the absolute and obvious.

Recommendations

It has to be pointed out that achievements in Basic Science and Technology (BST) depend on the following:

- Institutions of learning in Nigeria especially schools and faculties of education must accommodate Basic Science and Technology as a course.
- Recruitment of resource personnel that are grounded in pedagogy and andragogy of Basic Science and Technology is a must.
- Training and re-training programmes for teachers of Basic Science and Technology is a must.
- A redefined welfare package is a matter of must if development must be brought quickly through effective teaching of science and technology.
- It is not out of contest for science teachers to establish and monitor a strong, productive and scientifically based industry that specializes in a particular product of need by the Nigerian populace in order to show an application of classroom theories and practices. Establishing Institute of Children Science or Basic Science and Technology is a must in Nigeria.
- Young eagle must fly with the assistance of colleagues, fathers and mothers of science education through a united, strong and dynamic Basic Science and Technology Teachers' Association. It is this association that will fly the flag of development through teaching, upholding to a slogan "**No Development, No Surrender**".

References

- Afuwape, M. O. (2006). Understanding the Nature of Integrated Science. Science Teachers Association of Nigeria, *proceedings of the 47th Annual Conference* 225.
- Afuwape, M. O. and Aanu, E. M. (2010). Enhancing Integrated Science for Higher Studies: Teacher - Students Opinions. *Osiele Journal of Education Studies* Vol. 6, P7, 95 - 107.
- American Association for the Advancement of Science (1989) a project 2002: *Science for all Americans*. Washington D.C. AAAS.
- Bajah, S (1995). Goals and needs in science education - past and future. In A. Hofstein; B.S. EyIon & G. Giddings (Eds) *Science Education: From theory to practice* (pp3-6).
- UNESCO - UNICEF (1971). Planning for Integrated Science in Africa. *Report of the Workshop for Science Education Program Planners in English Speaking African Countries* (Ibadan, Nigeria September 20, October 4).
- D' Arbon J.A. (1972). A Study of the Concept of Integration of Science Subjects in Secondary Schools. In Cohen, David (Ed) (1977): *New Trends in Integrated Science Technology*. Lv. Paris. UNESCO.
- Gang, Ding. (2010). *Froot Education China* 5(i); 26-36 D01.10, 1007/511516-010-0004-3.
- Naughton, (1994). What is technology?" In Frank Banks (Eds). *Teaching Technology*. London: The Open University, 7-12.
- Robinson, W. P. (1998). Progress in early childhood education: 1960s and 1970s. *International Journal of Educational Research* Vol. 29(1), 7-24. ISSN0883-0355.