

VISION AND MISSION OF INTEGRATED SCIENCE EDUCATION IN THE 21ST CENTURY

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Abstract

This paper defines Integrated Science, examines the genesis of Integrated Science in Nigeria, defines vision and mission respectively. The researcher discusses the vision of Integrated Science education in Nigeria in form of its aims and objectives which include: provision of sound basis for continuing science education, enhancement of the scientific literacy of the citizenry, etc. The researcher also discusses the mission of Integrated Science education in Nigeria in terms of its philosophy which include: active involvement of pupils in the learning process, ability of the pupils to use and classify given information, etc. More so, the researcher discusses, in detail, major constraints to the vision and mission of Integrated Science education in Nigeria which include; lack of qualified Integrated Science teachers, poor method of teaching, etc. The researcher proffers useful recommendations.

Introduction

The critical words in the theme of this conference are VISION and MISSION. Before we go into detailed definitions of the two. critical words above, it is pertinent to know what Integrated Science is, and the brief history of the subject in Nigeria.

What is Integrated Science?

In an attempt to define Integrated Science, science educators have looked critically into the subject and have expressed their views. To Bajah (1983) Integrated Science is meant "to unite all of us who have specialized disciplines in science". This definition by Bajah looks at Integrated Science from the curriculum developer's angle, in which case people from the various science subjects are brought together for the purpose of shaping a science curriculum that incorporates the contributions of all of them. Jegede (1985) sees Integrated Science as "the gateway to the study of single science subjects". This view sees Integrated Science as the first form of science a student or pupil encounters in the school. In his own definition, Foecke (1974) sees Integrated Science as "seeing nature in the unity with which it sees itself. Here, Integrated Science is viewed as an- approach to looking at nature in its totality.

History of Integrated Science in Nigeria

In 1968, the West African Examination Council (WAEC) now West African Secondary School Certificate Examination (WASSCE) contacted the Science Teachers' Association of Nigeria (STAN) for the purpose of improving WAEC's science syllabus. Subject Curriculum Development Committees were therefore set up to consider both the changing needs of Nigerian pupils and international trends in their respective subject areas and drawing on their teaching. The committees were working on separate subjects - Biology, Chemistry, Physics. Later, another committee was set up consisting members of the afore-mentioned subjects to work on Integrated Science and the result of their deliberation was documented in STAN's Curriculum Development Newsletter No. 1 which marked the beginning of Integrated Science teaching and learning in Nigeria.

Integrated Science curriculum materials were designed for the first two years in the secondary school. These included pupils' text, workbook and Teacher's Guide. These materials were revised to meet the requirements of the National Policy on Education, i.e. 6-3-3-4-education system.

Distinction Between Vision and Mission

Having acquainted ourselves with the meaning of Integrated Science and its genesis in Nigeria, it is appropriate to look at many definitions of VISION and MISSION. Yoloje (1998) defines VISION as "*mental image* or object of an aspiration". This means that vision of education is a mental image of what education should aspire to be. Vision is a menial creation, a mental and

intellectual perception of a desired end, situation, outcome, condition or environment that an individual or group, organization or system would deliberately wish to create and to see materialized, Obani (1998). El-Namaki (1991) describes vision as "a process of direction setting"¹ and goes on to state that direction setting "connotes the identification of something in the future". Rowe et al (1986) define vision as "a concept for a new and desirable future reality that can be communicated throughout the organization..." You may want to ask for the reason behind holding a vision. Reason for vision may arise from a need to control a country's destiny, a need for creative strategies, demands of turn-around or recovery; and a need to change the corporate culture of a country.

Mission

Mission is defined as the special duty which someone is directed to perform. It can also be described as the actualization of visions which are sometimes ambitious dreams. Whereas vision is more conceptual, mission is more practical - a kind of "translation of the ideals or realities of visions into pragmatic actualities. Mission deals with concerted efforts to establishing the dreamed ideals of visions.

Mission is a single-minded activity or set of activities directed at achieving definite desired goals. Mission represents the processing of the raw materials provided by vision into the finished products the desired ends.

Vision of integrated Science Education

The vision of Integrated Science education implies looking ahead or dreaming of what the future of Integrated Science Education in Nigeria-will be in the 21st century. The vision of Integrated Science Education in Nigeria could be discussed in terms of its aims and objectives. The principal reasons why the Nigerian government started Integrated Science programme are as follows: -

- a. to enhance the scientific literacy of the citizenry;
- b. to provide sound basis for continuing science education;
- c. to enable pupils/students gain composite knowledge of his environment, and
- d. to enable pupil/student have a general view of the world of science.

(a) To Enhance Scientific Literacy of the Citizenry: This implies that the world is so engulfed by science that every living being deserves a rudimentary or general knowledge of it for his existence. Since everybody cannot or does not train as a specialist, the non-science person can learn science in the form of Integrated Science. More so, the majority of the children in many parts of the country do not get beyond primary or Junior Secondary School. Clearly, science needs to be introduced as an element in primary and Junior Secondary School education and such science must of necessity be the integrated type.

(b) To Provide Sound Basis for Continuing Science Education: This implies that children having had broad-base knowledge of science in form of Integrated Science at the Primary and J.S.S. Levels, they can proceed to specialize in any of the core science subjects (Physics, Chemistry, Biology) at the Senior Secondary School (S.S.S.).

(c) To Enable Pupils/Students Gain Composite Knowledge of His Environment: This implies that man's environment is not compartmentalized into subjects like Biology, Chemistry, Physics, etc. but involves the combination and interaction of these and some of the subject areas in other spheres of human endeavor. Hence a child needs to study Integrated Science which comprises Physics, Chemistry, Biology, Agric, Geography, etc in order for him to gain composite knowledge of his environment - man's environment needs to be understood in its totality rather than in fragments.

(d) To enable Pupil/Student have a General View of the World of Science: This means that even though the learner may specialize in any of the science subjects later in life, he will not be totally out of tune when discussions are going on in other branches of science. This is because he must have gained rudimentary knowledge of other branches of science from integrated science at the primary and J.S.S. levels.

Mission of Integrated Science Education

The mission of Integrated Science education implies those things that have been put in place by Nigerian government in order to achieve the vision of Integrated Science education as mentioned earlier. In order to accomplish the aforementioned vision of Integrated Science education in Nigeria, the sponsors of Integrated Science programme in Nigeria have specified the type of interaction that should take place in the classroom.

Among the methods to be used, the following are specifically recommended:

- (a) use of discovery teaching tactics;
- (b) the inclusion of problem-solving activities, and
- (c) the involvement of students in laboratory exercise.

The use of one or combination of the above-listed recommended methods of teaching will enable pupil/student to:

1. be actively involved in the learning process;
2. be able to think in an independent fashion;
3. recall information and experiences;
4. use and classify given information;
5. apply previous knowledge to a new situation;
6. observe carefully and thoroughly, and
7. report completely and accurately what is observed.

You will agree with me that if pupils or students in Nigerian Primary and Secondary Schools can perform the above-stated activities, the vision of Integrated Science education will be accomplished.

Constraints to the Vision and Mission of Integrated Science Education in Nigeria

The following are the major constraints of the vision and mission of Integrated Science education in Nigeria:

(a) Teachers

Teachers are the implementors of the content of the curriculum. And as such, the knowledge they impart to the students is very important in order to achieve the stated objectives of teaching Integrated Science. It is saddening that many teachers handling Integrated Science in our secondary schools are not qualified to teach the subject. They are either biologists, chemists, physicists, etc (Oludipe, 1997). Automatically, those teachers teach only the aspect of Integrated Science they understand. Hence, students will be confused and lose interest in the subject. Once the students do not show interest in the subject, the visions of the subject will be defeated.

(b) Method of Teaching

A teacher that did not undergo pedagogical training in Integrated Science Education may not be able to know and make use of the recommended methods for teaching Integrated Science. The common method being use is the lecture method. Lessons are hardly planned to illustrate Integrated Science as a child-centred and dynamic subject. Or else, what can one infer from a situation whereby a teacher teaches his students SOIL by just lecturing without taking them out to really touch, smell and feel the types of soil mentioned to them in class? Automatically, the students will not comprehend the concept taught and hence, develop negative interest in the subject. This will affect the vision and mission of the subject.

(c) Allotment of Time

The time allotted to Integrated Science in most secondary schools is not enough to teach the subject. The subject involves many activities, hence, spending insufficient time to teach it will not allow the few trained teachers on the subject to drive home all the necessary points to the students. Thus, the students will not be well informed and this will create negative impression about the subject in the students.

(d) Practicals

In most schools, laboratories are not provided to normally put into practice the Integrated Science concepts taught in the class (Oludipe, 1997) and the students at this level are very inquisitive in nature. So, if the concept taught in class is not shown to them to see, feel and touch, they will surely have negative impressions about the subject.

(e) Teaching Materials

Integrated Science as a subject is child-centred and activity-oriented. Therefore, students must be actively involved in the teaching and learning of Integrated Science. Most of our secondary schools - those who are fortunate to have laboratory - do not have equipment with which concepts of Integrated Science could be well explained practically. Hence, students will not be able to practicalise most of the concepts taught theoretically and this may lead to easy erasure of the concepts taught from the students' minds. Without mincing words, you will agree with me that the above-mentioned points have served as cogs in the wheel of the realization of the vision and mission of Integrated Science education in Nigeria.

Recommendations

The researcher recommends some strategies for making the visions of Integrated Science Education in Nigeria realizable and its missions attainable. The strategies are:

(a) Integrated Science Education Programme

This is the programme meant to train Integrated Science teachers. The training can be grouped into two ways: in-service and pre-service, respectively. The in-service programme should be for the teachers teaching Integrated Science who were not trained as Integrated Science teachers per se, while the pre-service programme should be for Integrated Science education students and science education students at both Colleges of Education and University levels respectively. All the science education students at both College of Education and University levels should offer Integrated Science as a minor teaching subject in their first and second years respectively, while those who offer Integrated Science as a course should continue with the course in their subsequent years.

Furthermore, the Integrated Science education programme (in-service and pre-service) should include the following major things:

- i. drills on the content of Integrated Science;
- ii. drills on appropriate use of language of instruction;
- iii. drills on application of methods of teaching;
- iv. drills on improvisation techniques, and
- v. drills on course evaluation techniques.

All the drillings into the above-mentioned vital areas can take the form of seminars, workshops, symposium and formal Integrated Science education programme at the Colleges of Education and Universities respectively. During the programme of any of the above-mentioned media, care should be taken to group the teachers concerned according to their areas of specialization in order for them to be well drilled on the topics outside their areas of specialization.

(b) Allotment of Time

The school authorities and the policy makers should increase the number of periods for teaching Integrated Science on the timetable of most of our secondary schools. This is necessary so that the students can be exposed to more investigative and problem-solving scientific activities than is being done presently.

Conclusion

So far, this paper has been able to critically look at the visions and missions of Integrated Science education in Nigeria and the major constraints to the visions and missions. The researcher is of the view that if the Integrated Science teacher education programme is given utmost attention, all other constraints will be a thing of the past. Thus, the vision of Integrated Science education will be realizable and its mission attainable.

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