DEVELOPING INDIGENOUS INSTRUCTIONAL STRATEGIES FOR EFFECTIVE SCIENCE EDUCATION

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Abstract

Developing and promoting indigenous instructional strategies for effective science (chemistry) education is sine quo non. This is because teaching chemistry is unpopular and irrelevant in the eyes of students which lead to gaps between student’s wish and teachers’ lessons. A historical perspective of the Nigeria instructional system of education from pre-colonial, colonial to post-colonial era is discussed. The types and challenges of the instructional system were identified with ways of developing instructional strategies for effective science education. In view of the factors discussed in the paper, the author recommends; training and retraining of teachers on improved instructional strategies using traditional (indigenous) methods, recruitment of indigenous teachers among others.

Keywords - indigenous, instructional strategies, science education, chemistry

Introduction

Developing and promoting indigenous instructional strategies for effective science (chemistry) education is sine quo non. Research has shown that chemistry teaching

- Is unpopular and irrelevant in the eyes of students (Yager, 1992).
- Does not promote higher order cognitive skills.
- Leads to gaps between students’ wishes and teachers teaching.
- Is not changing, because teachers are afraid of change and need guidance (Yager, 1992).

A factor common to all of the above seems to be the lack of relevance of teaching chemistry. Although school chemistry programs, are set out to develop conceptual appreciation of the way scientists do things and the importance of the teaching providing a useful education is doubtful. The stress on conceptual understanding and the appreciation of the nature of science tends not to be relevant for functionality in our lives i.e. it is its relevance to the home, the environment, future employment and most definitely for future changes and developments within the society. The understanding tends to be geared to internal concepts within the subject itself (Njoku, 1995).
Generalizing, chemistry curricula tends to put the subject first, and applications second. Inadvertently, relevancy is in the processes and products we utilize in society and only afterwards in the understanding (which is utilizing scientific principles in solving problems or making decisions). Thus, in terms of relevant conceptual learning, we would see that current curriculum approaches are not providing the impetus to promote the popularization of chemistry that is expected. We need to find ways to initiate teaching based on societal and environmental situations and then develop the conceptual learning that allow students to appreciate the relevance of the science (Yager, 1992). Indigenous instructional strategies tend to be the best alternative for effective science (chemistry) education which is also directly associated to relevance of chemistry education.

**The Meaning of Indigenous Instructional Strategies**

Instructional strategies are methods that are used in the teaching – learning process to ensure that the sequence or delivery of instruction helps students to learn. The term ‘indigenous’ means, native, original, aboriginal, homegrown, local or ethnic, it also refers to ethnic groups that have historical ties to groups that existed in a territory prior to colonization or the formation of a nation, which normally preserves a degree of cultural and political separation from the mainstream culture and political system of the nation’s state within the border of which the group is located (Bangbose, 1987).

The term ‘instructional’ means pedagogical, educational, informational, teaching or scholastic education, on the other hand, it is to acquire the knowledge, skill and values both personal and social, deemed appropriate for the society (Bangbose 1987).

**Historical Perspective of Nigeria’s Instructional System**

Nigeria’s instructional system has metamorphosed from the pre-colonial era to the colonial and finally to post colonial era. The pre-colonial era, instructional system is basically the induction of a person or group into the society and in preparation for adulthood. The person or group (children or adolescent) are engaged in participatory education through ceremonies, rituals, imitation, recitation and demonstration. Career activities are practical farming, fishing, cooking, weaving etc; while recreational subjects include dancing, racing, wrestling, acrobatic display etc (Fatunwa, 1974).

The colonial era ushered in formal education into Nigeria by the Christian Missionaries in the year 1842. The missionaries were Rev. Thomas Freeman, Bishop Samuel Ajayi Crowder and G.A Collman, they built churches and established schools as an integral part of missionary activities. Their aim and instructional strategies was designed to train adherents on clergy and cleric for the purpose of evangelism and missionary work.
Within the same period under review, educational activities of one form or the other were in the Northern provinces, prior to the proclamation of the protectorate of Northern Nigeria in 1900 with Lokoja as the headquarters; organized educational activities had been going on in the North. These were, however, for most part, Quoranic schools, schools for religious instruction and the reading of the Quoran. The Mallams were the instructor in 1913, (a year before amalgamation). The introduction of the western brand of formal education into the North was done by Lord Lugard who was the first High Commissioner (Fafunwa, 1974).

**Post - Colonial Era**

The present system evolved from the outset of independence in the year 1960. The request of Ashby commission in April, 1959, with the change to conduct an investigation into Nigeria’s needs in the field of post school certificate and higher education over the next decades, was the foundation for the development of the present system of education in Nigeria. The main concern during this period in the education system is for the improvement of standards.

**Types and Challenges of the Present Instructional System**

The present educational system is faced with unprecedented crises. Crises of supply and demand, crisis of teachers and teacher effectiveness, crises of secret cults in the educational system, crises of lack of effective administrative leadership, crisis of examination malpractice etc. Most of these problems are reflection of the present Nigerian society (Cajas, 1999).

**Crisis of ineffective administrative leadership**

Nigeria’s educational system suffers setback due to ineffective administrative leadership arising from changes in various regime from civil to military and vice versa. It was until 1999, Nigeria obtained civil rule and is still nurturing to be stable. Changes in education minister have subsequently affected previous policies and programmes. Many educational plans, policies and programmes were abated due to change in leadership. A few strike action in universities, polytechnics and colleges of education are based on agreement reached by previous regimes which present leadership find difficult to comply. The effect of this strike cannot be over emphasized. Prolonged strikes distort the academic calendar; to annul the effect, crashed programmes are adopted and half baked graduates are produced (half baked chemistry teachers) who are ineffective. Ineffective teachers produce poor students who engage in malpractice, cult activities, become thugs among others and the chain reaction lingers. The aforementioned crises are inter-related, inter-twined and inter-woven. The problems are a reflection of the present leadership in the society (Cajas, 1999).
Ways of developing indigenous instructional strategies for effective science education

(1) **Adopting Improvised Technique of Instruction**

Improvised technique of instruction is using locally (indigenous) made materials when customized materials are not available. This is done by demonstrating the concept by experimenting using improvised materials from the environment. An example is the sublimation experiment done in the class using camphor. Also, potash can be used as catalysts to speed up bean cooking process and alum for water sedimentation in water treatment while wood ash can be used to ripen fruits etc.

(2) **Using Nigerian languages as media of instruction peculiar to the locality or state**

Evidence from the second international science study showed that Japanese primary school children came first in primary science among the countries of the world with the Nigerian pupils coming last (STAN, 1992). It was observed that, most technologist in that country (Japan) were taught right from their youths in their own languages and hardly would one find an average Japanese on their streets who understand English.

Language in learning science plays major roles; it features as a subject in the school curriculum and also as the medium of instruction in other subjects (Penick, 1992). It is believed that scientific processes, principles, concepts, terms and thinking are difficult enough by themselves and the fact that Nigerians have to learn these in a second or third language compounds the problem. The pitiable side of the problems is that the enforcement of English language as a medium of instruction has probably contributed immensely to making Nigerian students perform woefully in exams both in English language as a subject and in the sciences, thereby making them ‘jack of all trades, masters of none.

Language influences the thought process of facts. Principles and generalization are not only to be regurgitated during examinations. Students will not be in the position to use the knowledge acquired since it has not been internalized, the lack of internalization of scientific development inhibits understanding. The situation is unacceptable and needs urgent redress (Penick, 1992).

(3) **Developing and strengthening of Tsangaya method of Instruction**

This is a combination of the Islamic and Western style of education. The Federal government has kick started it in some states of the federation. This Tsangaya
method is aimed at eradicating or minimizing street urchins (almajiri) to the barest minimum.
The street children in Kano State (Northern Nigeria) are accustomed to Islamic style of life as tradition. So incorporating western education in line with indigenous Islamic instructional strategies will greatly enhance effective science education.

(4) **Recruitment of indigenous teacher and continuous training of teacher on the use of indigenous instructional strategies for effective science education**

If the child is the centre of the educational systems, the teacher is the pivot of the educational process. Symposium, workshops, seminars, etc. should be organized periodically to train teachers on optimum use of traditional instructional strategy for effective science education. In the same vein, aborigines should be trained and employed to teach. Aborigines are the original indigenes that are custodian of norms and values, culture and belief etc, they can import knowledge to their natives. In education, teachers are the main determinants of effective quality implementation of educational objectives.

(5) **Incorporating indigenous entrepreneurial studies into the curriculum as career or discipline**

Indigenous textiles, fabric carvings, weaving, medicines, food etc when properly and hygienically produced can generate foreign currency. Food crops like ‘zobo’, ‘zogale’, ‘kuka’ among others have got universal acceptance for their nutritious benefit and efficiency in chemotherapy. These indigenous enterprises should be promoted and developed.

(6) **Incorporating indigenous recreational activities such as wrestling, dancing, drumming, acrobatic display into the physical health education curricular**

Interested students can participate and perform excellently in local competitions such as inter-house sports, inter-school or inter-state activities and can go beyond to represent the country at large in Olympic and other world tournaments.

Other indigenous instructional strategies presently developing and which need further enhancement are indigenous music, film (home video) sculptor, art work to mention a few.
Conclusion

Most often teachers are faced with the task of many syllabuses to cover within a limited time for the sake of students writing final examinations; hence the issue of taking time to develop indigenous instructional strategies for effective science education leaves much to be desired.

In view of the aforementioned factors discussed in the paper, the researcher recommends,

- Training and retraining of teachers on improved instructional strategies using traditional (indigenous) methods.
- Recruitment of indigenous teachers
- Making indigenous dialect a subject and discipline (career)
- Enforcing local content production of most instructional materials (teaching aids) among others
References


