VISION AND MISSION OF MATHEMATICS EDUCATION IN NIGERIA

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Abstract

A nation cannot develop meaningful technology without science just as science cannot develop without mathematics. It is on this basis that the topic vision and mission of Mathematics Education (ME) in Nigeria was chosen by the writer. The paper started proper by reviewing the history of ME in Nigeria before and after independence. It then went further to enunciate the problems of ME in Nigeria which includes: Students' population explosion, Curriculum and curriculum changes and Shortage of qualified mathematics teachers. The highlights of the paper then dwell on the vision and mission of ME in Nigeria to include; the use of Information Communication Technology (ICT) in the teaching of mathematics, the establishment of mathematics laboratories in schools and the establishment of mathematics welfare board by all tiers of government.

Introduction

Balogun *(1997:* 262) citing Kuku (1989), staled that a nation cannot develop meaningful technology without science just as science cannot develop without mathematics. The importance of mathematics can clearly be seen, considering the utilitarian aspect of mathematics in preparing a pupil for a useful living, Counting, notation, addition, subtraction, multiplication, division, weighing, measuring, selling, buying are some simple and fundamental processes of mathematics which have got an immense practical value in life. It is on the basis of the usefulness of mathematics in the society, that the writer chose the topic, "vision and mission of mathematics education in Nigeria".

The paper started proper by looking at the historical review of mathematics education in Nigeria before and after independence. It then dealt with the problems of mathematics education in Nigeria which includes; students' population explosion, curriculum and curriculum changes -and shortage of qualified mathematics teachers. On the highlights, (he paper treated the vision and mission of mathematics education in Nigeria in the 21*[1] century. Here, the writer discussed the use of Information and Communication Technology (ICT) in the teaching of mathematics, the proliferation of mathematics laboratory and the establishment of mathematics welfare board by the three tiers of government.

Mathematics Education in Nigeria Before Independence

Mathematics Education in Nigeria started long before the advent of the Christian missionary. According to Nigeria Certificate of Education Course Book On Primary Education Studies Cycle 2 (1990:105), mathematics was invented because man needed it to solve his domestic and economic problems like buying and selling. To substantiate this in the Nigerian context, cowries were used by towns and villages in Africa as a means of exchange for goods and services. Also, before the advent of the missionaries, different tribes were already making use of the local calendar e.g. Afor, Nkwo, Eke and Orie in Igbo language. This shows that the counting of the days of the week was advanced. More so, the counting also reflected Base Four in Number bases which is under Arithmetic in Mathematics.

Formal education was introduced by the missionaries between 1842 and 1860 with the establishment of a primary school al Badagvy by the Wesleyan Methodist Missionary Society in 1843. Instructions were then given in the four R's - Reading, Writing, Arithmetic and Religion in the elementary (primary) schools for the general education of the converts, teacher-catechists, interpreters, servants and cooks (Badmus, 1985:2).

During the colonial era, before I960, most primary schools in Nigeria adopted Efficiency Arithmetic Series, A Shilling Arithmetic by C. Pendlebury and W.S. Beard, and Arithmetic (series) by Larcombe. In a study commissioned by the Council of the Mathematics Association of Nigeria on "The Evaluation of Mathematics Education Component of the Primary School Curricula between 1930 and 1960", Badmus found that the above books were in use in most parts of Nigeria during this period. All the examples used in the books were related to English culture while Nigerian pupils had to struggle doggedly with the mechanical operations using formulae and rules without understanding. They made no provision for individualization, (Badmus, 1985:3-4).

Mathematics Education in Nigeria After Independence

Following the grant of independence to Nigeria in 1960, the wind of change in the school curriculum across the world brought innovations between 1962 and 1965 into primary and secondary school mathematics curricula in Nigeria. The rest of that decade of the 1960s saw gradual introduction of modern mathematics programmes into some areas of secondary school classes. The retraining of mathematics teachers attached to these classes was done in summer mathematics institutes organized between 1965 and 1970- During these years, the proportion of students examined under these programmes by the West Africa Examination Council (WAEC) who were successful in the years was greater than the proportion of students who were successful under the traditional mathematics syllabuses.

However, the Trend began to change in the reverse direction from 1971 when majority of secondary school enrolled their students for modern mathematics without proper retraining of their traditional teachers. There was serious public outcry on-this trend between 1975 and 1976. The Federal Military Government intervened and organized a National Conference on the Teaching of Mathematics in Nigeria, held on 6th and 7th of January, 1977, at Palm Royal Hotel in Benin City, (Badmus, 1997: 55-57 & Odili. 1986:44-45).

The Conference recommended that the Nigeria Educational Research Council (NERC) and Comparative Education Study and Adaptation Centre (CESAC) then, now joined to form Nigerian Educational Research and Development Council (NERDC) be commissioned to develop national mathematics curricula based on these objectives that emerged from analysis of the National Policy on Education. The curricula developed by these bodies were later critiqued by experts and professionals and ratified by the National Council on Education (Badmus, 1997: 57).

In response to recommendations from many conferences and seminars, the Federal Government of Nigeria established the National Mathematical Centre on the 1st of January 1988. The decree (Decree No. 40. giving it a legal existence was not promulgated until December 12, 1989. It is worthy to note that the National Mathematical Centre (NMC) has embarked on award of scholarships for study of mathematics/mathematics education. It should also be noted that teaching modules for. all levels have been produced by NMC.

The Mathematical Association of Nigeria (MAN) has also put in a lot of efforts to improve the teaching and learning of mathematics right from its foundation. Apart from sensitizing the mathematical community with its annual conference, the state branches have been organizing workshops and seminars for teachers in their respective states. They also organize competition for secondary schools pupils in preparation for national competitions. This organization has also produced high quality textbooks based on national primary and secondary mathematics curricula, (Badmus. 1997:61).

The Problem of Mathematics Education in Nigeria

The problems are as follows:

Students' Population Explosion: Gone are the days when a teacher is faced with 20-30 students in a class who consider themselves privileged and fortunate few to gain admission into secondary school. Such students were selected by means of entrance examination from a cream of primary school leavers. Such students were themselves ready to work on their own. The teacher was devoted and because of the small size of the class, he could attend to individual problems. The closer relationship between the students and the teacher could generate a kind of liking for the teacher by the students and hence for the subject he teaches.

The situation in our present day school system is alarmingly embarrassing. The thinnest class runs between 40 to 45 students and the number is greater in urban schools. Researchers have been conducted over the years as to the effect of class size on the amount of learning that takes place among children in the class. Although there are differing results about the effects of class size on the rate of learning, it is beyond doubt that less time would be available for individual attention in classes over forty students. Under such kind of situation, one would expect a reduced rate of learning because fewer students will have the opportunity to receive little direct attention from the teacher, (Osafehinli,
1986:274). :

Curriculum And Curriculum Changes: Curriculum changes in mathematics have occurred in several countries for one reason or the other but more importantly because of the desire to improve school mathematics teaching to meet the ever changing needs of the society, science and technology. In most of these countries, like Britain, France and USA, the nationals were responsible for evolving the right kind of curriculum which will suit their needs.

In Nigeria too, curriculum changes have occurred and for a long time, the tendency has been to transfer unquestioning!}' syllabus from the advanced countries of Britain and USA to Nigeria based on the good faith in the universality of the subject. Such understanding loses sight of some problems usually raised by a curriculum change. These include the right type of personnel, supply of funds for implementing the new

programme, experimenting personnel, experimenting and obtaining results on the new curriculum, following up the pilot scheme with a suitable system of evaluation, (Osafehinti, 1986:277).

Shortage of Qualified Mathematics Teachers

• Osafehinti (1986:275), opined that one of most important factors for acute shortage of teachers in general and mathematics teaching in particular, is low status accorded the teaching profession in the Nigerian society. A lady once said to a man "what is your pride? After all, you are a teacher". The teacher is not highly respected in the society as his colleagues in other professions and this had affected the attitude to teaching and suitability on the job.

The average Nigerian Mathematics teacher has no motivation for teaching and lacks the morale, the zeal and dedication to duty. With an attitude not conducive to work, coupled with the demands of increasingly large classes and other constraints to mathematics teaching, such as lack of instructional materials, poor students' attitude to the subject and poor learning environment, the teacher is not able to do much in the classroom. When the situation becomes unbearable, he quits for other jobs or becomes self-employed (the group which constitute the new breed of businessmen) or' resigns into politics.

Vision and Mission of Mathematics Education in the 21st Century

The following are regarded as the vision and mission of mathematics education in the 21st-century:

The Use of Information and Communication Technology (ICT) in the Mathematics

ICT as a tool has been the most important application of computers in education so far. School children of all ages use word processors for learning to write and later for writing essays, poems, play and investigate reports. With this, what readily comes into the mind is the art of using computer for instructions-Computer Assisted Instruction (CAI). Iji (2003:173) citing Steinberg (1984) staled that in CAI, lesson production is guided by the learner's knowledge, skills, understanding, expectations as well as motivation. She further stated that the learner's education needs, not the computer hardware or software, determines the nature of the lesson. Computer is an open secret that the computer offers powerful features of facilitating learning. Such as tutor-like interaction with the learner. However, a lesson is presumed effective when the features are adequately and properly applied.

Apart from the use of computer as a stand alone for the purpose of instruction, there could be several connections. These connections could simply be referred to as a network. This several connections of many computers together is to allow teachers and students communicate with each other. It may give them the opportunity of obtaining information; participate in educational activities provided on the network, and to access the Internet.

With the above features, there is no gainsaying that if ICT is employed in teaching and learning of Mathematics in Nigeria in a large scale then it will help to remove the problems of students' population explosion and shortage of qualified Mathematics teachers. This will be done through the Internet facilities as a teacher would be able to teach as many students as possible.

The Establishment of Mathematics Laboratories in Schools

National Teachers' Institute Course Book On Mathematics Cycle 2 (1990:235), defined Mathematical Laboratory as a room containing relevant tools for teaching **and learning** mathematics in a practical manner. The Mathematics laboratory provides the student **with experiences** that he needs in order lo acquire the concept, principles and generalisations in Mathematics.

This may involve performing an experiment, viewing a film, playing a game, discussing, reading, programming a computer, building a model, solving a problem, making a survey, drawing a design, making a graph, presenting a mathematical skill, completing a test, proving a theorem practically, and so on.

With the above it is clear that if Mathematics laboratories are established in schools (i.e. primary, secondary and tertiary), it will help the students to learn properly the basic concepts of difficult Mathematics topics. According to Idahosa (2003: 193), good knowledge of basic shapes serves as prerequisite for the learning and understanding of: areas and volumes of complex planes and solids, Co-ordinate geometry, Calculus etc. Thus a teacher needs to be able to paint the picture of complex abstract mathematics in the minds of the students to facilitate learning and understanding.

Establishment of Mathematics Welfare Board at the Three Tiers of Government

The board should be charged with the following responsibilities:

1. To make sure that ICT is used to teach Mathematics.
2. To ensure that Mathematics laboratories are established for school (from primary to tertiary).

3. To look at other issues relating to Ihc welfare of Mathematics and mathematicians.

Implication for (he Legislators

Legislators at the three tiers of government should as a matter of urgency legislate and pass, into law the Mathematics Welfare Board. This body would be saddled with the responsibilities; of ensuring that Mathematics is taught with ICT and that Mathematics Laboratory should be a must for every school from primary to tertiary. Also, other positive issues that will improve Mathematics and mathematicians would be looked into and appropriate decisions taken.

Conclusion

The importance of Mathematics as clearly seen in the utilitarian aspect of Mathematics in preparing a pupil for a useful living and the fact that Mathematics Education leads to a very fast harnessing of a country's resources in view of science and technology, the subject should not be treated like other subjects. Thus the three tiers of government should ensure that Mathematics Welfare Board Ls established in their domains. It is only when high preference is given to Mathematics that the above vision and mission of Mathematics Education in the 21^{s_1} century can be accomplished.

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