THE RELEVANCE OF PRIMARY MATHEMATICS EDUCATION IN NATIONAL DEVELOPMENT

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Abstract

The nation is in great need of national development and it envisages that education is a vital tool for meeting this need. This paper therefore, discusses the development, objective, content and relevance of primary mathematics education in Nigeria. It was revealed that the mathematical ideas and concepts learnt at the primary level provide a good foundation for equipping every individual for life after school and pursuit of higher education. This is however faced with some challenges like the continued use of non-specialist teachers. The paper then recommended among other things that the guideline in the National Policy on Education (2004), on the use of specialist teachers in mathematics at the primary level should be properly implemented.

Introduction

The development of any nation rests basically, on the rate at which it is self-dependent in all ramifications. Such national development is characterized by a high level of modernization and. industrialization, economic stability, improved scientific and technological practices, good standard of living, improved human and material resources, high level of literacy. According to Chike -Okoli (2004), development is of human potentialities because they constitute the objects and subjects of development. In essence, she opined that the pursuit of national development should emphasize people, because it is the people that will develop all the indices of national development. Haggis (1991), had earlier stated that theoretical and empirical evidence abound which prove that investment on the training of the labour force plays a crucial role in economic development. According to him, some studies carried out by world Bank and other agencies have shown that in developed and developing countries, investment in education has been an important factor leading to increased productivity and hence to economic growth.

The primary task of education according to Kalu (1987), is to enhance human control over the natural environment, to hasten the collective realization of human needs, and to promote the effective utilization of creative abilities. Similarly, Adamaechi and Romaine (2000), Stated that education is generally accepted as a form of investment in human beings which in turn, results in some economic benefits and plays a vital role in a nation's future wealth and development. A nation's economic, social, cultural and political life therefore, rest squarely on the number of its citizens that had acquired basic education (Obiagwu, 2001).

This implies that education is a very important tool for attaining the objectives of those controlling it and this will differ from one time to another and from one country to another. In the Nigerian context, it anticipated that education would transform all aspects of life within the society, thus the relevance of primary mathematics education in national development would form the major consideration of this paper.

Development and Objectives of Primary Mathematics Education

Mathematics means different things to different people. To some, it is the language of Science and technology; to others, it is the king, queen and servant of the sciences; while to some others, it is the study of numbers, shapes, symbols, patterns etc. Lassa and Paling (1983:2), defined mathematics as "a way of finding answers to problems; a way in which we use information, use our knowledge of shapes and measures, use our ability to calculate, and most importantly, think for ourselves in seeing and using relationships. This definition focuses on mathematics as peoples' way of solving everyday life problems.

Primary mathematics education, which is mathematics, offered to children at the primary level forms the basic foundation for mathematics in the Nigerian education system. It has undergone several changes from the - colonial era to the present day. For instance, between 1930 and 1960, primary mathematics consisted mainly of topics described purely as arithmetic processes and books like Efficiency Arithmetic and Shilling Arithmetic were adopted. Some experts considered these textual materials as being very poorly written and the curriculum at that time was merely a listing of content in form of syllabus. Moreover, syllabus teaching and learning at that time was regionally based since there

was no nation-wide broad mathematics at that time.

A major move to address the problem of imbalance in the education system was through the 1969 Curriculum Conference. This resulted among other things, in the development of the National Policy on Education first published in 1977 and the introduction of a new series of teaching curricula. With regards to the primary school, the new teaching curricula included the Primary Education Mathematics Curricula. In the new Primary Education Mathematics Curriculum, the objectives, content and activities for each level of primary schooling are clearly outlined. Five broad objectives of primary school mathematics are as follows: -

1. Acquisition of functional numeracy on how and when to use arithmetic operations on both whole and decimal fraction numbers.
2. Acquisition of certain mental attitudes, which facilitate the developing of problem- solving attitudes and strategies.

3 Acquisition of techniques of representation and interpretation of numerical and other data.

1. Indication of abilities in measurement, approximation and estimation of number and quantity.
2. Development of spatial concepts and the ability to represent these using such tools as maps and scale drawing.

From these five broad objectives of primary mathematics, the specific objectives stated in terms of pupil behaviour were derived. Also the main concepts to be covered for each year of primary schooling were derived and they include: -

Main Concepts and Their Placement In Primary Maths. Curriculum

Concepts	year covered					
	1	2	3	4	5	6
1. Number and Numeration	x	x	x	x	x	x
2. Basic Operations in Mathematics	x	x	x	x	x	X
3. Measurement	x	x	x	x	x	x
4. Practical and descriptive geometry		x	x	x	x	x
5. Everyday Statistics				x	x	x

It is believed that this curriculum together with its main concepts, are series of pupil-centred activities designed to give pupils hands-on experience in their study of mathematics as well as relevant to the needs of the country (Federal ministry of Education, 1977). Having considered briefly the development and objectives of primary mathematics, this paper shall further examine how primary mathematics education contributes in the strive to attain national development.

Relevance of Primary Mathematics in National Development

Nigeria as a nation places high value on the subject mathematics. This fact could be deduced from the core status accorded to the subject right from the primary level. However, before identifying the relevance of mathematics in national development, it is necessary to consider some rational for studying mathematics at the primary level.

According to Lassa and Paling (1983), children need to satisfy certain needs, which they encounter at an early age, such as the ability to count and make simple calculations with numbers, the' ability to know about money and be able to make simple calculations; ability to measure, recognize shapes and know some of their properties. These needs when satisfied are then applied on dealing with specific problems. This means that we teach primary mathematics because of the usefulness of mathematical ideas and concepts in domestic, business and professional life of each individual. Thus primary mathematics provides a good foundation for equipping every individual adequately for life after school.

On the other hand, we also teach primary mathematics to prepare the pupils adequately for secondary education. It lays a good foundation for future advanced studies in mathematics and other related subjects. This is because for several topics handled in mathematics at the secondary and tertiary levels, the basics are usually laid in primary mathematics. Moreover, Obodo (1997), believes that we leach primary mathematics so as to enable the pupils develop a habit of effective critical thinking which will lead to effective and objective thinking. This according to him, is the basis for developing a scientific attitude to the world around them. It is against this background of the content of primary mathematics and the rational for teaching them, that the contributions of primary mathematics in national development will be discussed. They include:

Relevance of Number and Numeration in Everyday Life and in Other Subject Areas/Fields

The concept numbers and numeration are part of everyday life. For instance, the set of counting or natural numbers denoted by N=(l,2,3,4...) developed by the ancient Indians and Arabs, arose out of the need to count and keep record of their sheep and other objects; while the set of whole numbers enabled them to measure whole units. The set of irrational numbers (of the form p/q where p and q are integers and q is non-zero) was developed to enable mathematics have a system in which division was possible. Decimals are applied when using things like money, weighing or measuring. Negative numbers arc used on things like thermometers to show centigrade temperatures bellows freezing point. People devised means of keeping record of the number of belongings they had. Families kept record of how many people live in various houses. Thus, the concept of number and numeration is applicable when determining the population figure of a nation. The knowledge of the population figure is very vital in improving the standard of living and the quality of life of its' people. It also promotes the health and welfare of its' citizens especially, among high-risk mothers and children.

Again, mathematics is seen as a language with counting and numbers regarded as the alphabets. Mathematics language and numbering systems arc highly relevant in computer programming and modem technology. Digital computers use binary numbers. The binary system uses only the digitals O and 1, which are called bits. Where O represents (no current passing), and 1 represents (passing current). Some computers like IBM 7090 use the octal numbering system, while some others like IBM 360, 370 etc use the hexadecimal numbering system. The octal and hexadecimal numbering systems save much space while storing data than the use of binary numbers. However, the knowledge of binary, Octal and hexadecimal numbering systems can be of great help- when debugging programmes, comprehending computer operation and selecting computer equipment (Obodo, 2000). To do this, the knowledge of place value is of great importance to computer programmers.

Relevance of the Basic Operations in Mathematics

The four basic operations in arithmetic, which include the operations of addition, subtraction, multiplication and division, are applicable in everyday living and in various fields. Operations on arithmetic are vital in commerce and industries such as carrying out petty trading, large business transactions, buying and receiving change and production of goods. These are all able to determine how successful their businesses are by constantly keeping careful records of all money transactions in their ledger or computer files. Adding the total expenses and taking this away from the total income usually determines the balance carried down. This process is equally applicable in the banking sector in attending to customers, who are depositing, withdrawing, borrowing or asking for interest and balance. Also in building, the workers, hired labours, and cost of materials are properly determined and catered for in accordance with the terms of agreement.

The Relevance of Measurement.

Basic skills in measurement gained at the primary level arc relevant in everyday living and in various fields. Measurement involves measurement of length, weight, capacity, time, money, area, volume etc. This is relevant in areas such as surveying, building construction, architectural drawings etc. knowledge gained through this concept is relevant in functioning effectively in a carpentry.

workshop, in a grocery shop, as a petrol station i ^ , as a tailor or as a trailer dealing with such materials that require proper measurement. Without measurement, there will not be dosages on the drugs we take. In: fact, it will be very difficult if not impossible to produce drugs and other articles. Also there will be no speed limits for vehicle, no bearings to measure distances for aircraft travels and navigators. In large-scale farming, farmers require skills in measurement so as to determine what area of the land should be used for a particular type of crop. Acquiring abilities in the measurement of time are also indispensable in development because all human activities revolve around a specific time. For instance, railway and airways services depend greatly on (he use of the 24-hour chock. In relation to other subjects, most artworks, experiments in the sciences, practical in home economics cannot be possible without adequate skills in measurement.

Relevance of Practical and Descriptive Geometry

Knowledge gained in this area are applied in housing schemes, in building bridges, in engineering constructions, in surveying, architectural designs and in works of arts (Aminu, 2005), Patterns are derived from geometrical shapes and this geometrical patterns are applied in tessellation of surfaces, tiling, carpeting of floors and wall decorations and designing. For instance, if a man who is an interior decorator, wishes to tile a floor without leaving gap, such that a repeated pattern is formed, he requires some basic knowledge of two dimensional shapes, such as regular polygons.

Relevance of Every Statistics

Under this concept, pupils arc exposed to such topics like finding averages (mean median, mode), frequency tables, bar charts, pie charts, graphs etc. Kolawole and Oluwalayo (2005) stated that statistics provides a methodological basis for examining and understanding the world around us; makes possible many advances in science and technology and supplies a framework for improved decision making in management and public affairs. For instance, a company needs to know its average production, sales, profits, losses; a health worker needs to know the average weight of babies for each age level so as to determine babies that are under weight; a family, company, state or nation keeps records of average expenditure on wages and various sections. These information are easily shown on charts and graphs; for instance the last population census Figures could be represented using graphs and charts and then used for planning, distribution and management of resources. These statistical tools are very relevant in making long term and short term plans. They are therefore, important indices for monitoring ones' economics activities.

Challenges Facing Primary Mathematics Education

Despite the fact that a lot of progress has been achieved in the teaching of primary mathematics in Nigeria, some challenges are still being encountered. These challenges lend to limit the overall relevance of mathematics in national development because a faulty foundation affects an entire structure.

Teachers, most of who are not experts in mathematics, lack interest in the subject or even fear- it •are still handling primary school mathematics. Although the national policy on education (2004), section 4, number 19(c) (v), stipulates that there shall be specialist teachers of particular subjects such as mathematics, Science etc, this is yet to be fully implemented in most public and private schools. Most of these teachers do not adopt innovative and practically oriented techniques while teaching the students. 1'hey therefore, make the subject to appear more abstract than it really is. Thus, the syndrome of sustained haired for mathematics is nurtured from infancy and the junior primary so that by the time a pupil gels into primary 6, he or she would rather prefer not to have anything to do with the subject.

The large teacher - pupil ratio experienced in most primary school classrooms, makes it quite difficult for the teacher to give adequate individual attention necessary for the acquisition of mathematical concepts. This problem is further compounded by the lack of basic infrastructure and leaching materials required for effective learning. Information and communication technology is yet to be fully integrated in mathematics teaching and learning.

Finally, there is a general tendency to over simplify the relevance of mathematics in other subjects and in everyday life. Mathematics lessons are most often taught without making any

reference to its application in everyday living and relating to topics in other subjects. This affects the attitude of the pupils, because they are likely to perform effectively at tasks, which they consider, relevant to their needs and future career, The result is general poor performance in mathematics, right from the primary level, which is the foundation of the nations education system.

Remedies/Recommendations

In view of the challenges facing the teaching of mathematics at the primary level and it's relevance in national development, the following remedies are suggested as ways of making mathematics more effective:

(1) The use of specialist teachers at the primary level should be seriously implemented as stipulated in the national policy.

(2) Seminars, workshops, and conferences should be constantly organized for practicing teaching teachers to expose them to current innovations in the field. They should also be supervised to ensure that they are putting them into practice.

(3) Properly equipped mathematics laboratory with gadgets on information and communication technology like computer should be provided. Teachers should be computer- literate and taught how to use these gadgets.

(4) Curriculum experts and textbook writers should ensure that for each mathematics topic, a list of other related subject areas and life applications must be outlined.

Conclusion

In this paper, an attempt has been made to look at the concept of education and national development as it affects primary mathematics education. This paper described the development, objective and content of primary mathematics, in Nigeria. It also highlighted the relevance of mathematics in national development in terms of its application in everyday living and in other fields. It is therefore concluded that mathematics plays very important roles in national development, but this is not without some challenges.

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