MATHEMATICS EDUCATION: A NECESSARY TOOL FOR ECONOMIC AND SOCIAL RECONSTRUCTION

Abstract

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Mathematics education is an indispensable tool for science and technology, without which a nation can never be socially and economically reconstructed. This paper, therefore examines: the concept of economic and social reconstruction, mathematics, science and technology education, and achieving economic and social reconstruction through mathematics education.

Introduction

Mathematics education as defined by Odili (1990) is the process of shifting from methods of teaching which has to do with acquisitions of computational skills to the method of learning mathematics which enhances the understanding of mathematics and its application in other fields of study and real life situation or world of work. The emphasis here is on preparing the individual for life in the community and reforming the society for relevance, adequacy and competitiveness in the world.

Buflon (1988) sees mathematics as a rich, vibrant and accessible activity with innumerable applications and uses. Its role in nation building has been revealed by various civilizations. For example, the use of mathematical ideas by the Egyptians in building their world famous pyramids. Mathematics education serves as the fulcrum upon which scientific innovations and technological breakthrough revolve.

The FME (1998) in appreciation of the importance of mathematics education for national development through economic and social reconstruction, has compelled every child to learn mathematics from nursery through primary to secondary education. However, in spite of the importance attached to the subject, it is painful to point out that the role of mathematics education in economic and social reconstruction has not been fully felt in Nigeria. Hence, this paper tries to examine concepts of economic and reconstruction, the importance of mathematics and its relationship with science and technology, strategies in mathematics education that would help in achieving social and economic reconstruction.

The Concept of Economic and Social Reconstruction

The concept of economic is the adjective form of the noun economy. Economy according to Hugo (1978 involves the system of relationships in a society. Determining the allocation of scarce economic resources and concerned with production, distribution and exchange.

Lipsey (1979) viewed economy as any specified collection of interrelated marketed and non-marketed productive activity. From the above definitions, the central problem of economy is the existence of limited resources and unlimited wants. Nigeria has been suffering from tremendous economic problems.

Asiodu (1999) stated that since 1981, Nigeria has been in economic stagnation and decline. The Gross Domestic Product according to him registered a negative growth rate (minus 5.5%) in 1981 and (3.4%) in 1986.

The concept 'social' is an adjective form of the noun society, which according to Webster (1947) pertains lo the welfare of human society. Olalobou (1995) 'social' as of or concerning human society, its organization or quality of life, human group involving two or more persons. The basic feature in these definitions has to do with quality. A report compiled by the Federal Office of Statistics and National Population Commission titled "Poverty and Welfare in Nigeria" sponsored by the World Bank as cited in Asiodu (1999) ranked Nigeria below Kenya, Zambia in Programme poverty level. More so, in the Human Development Index (IIDI) by the United Nations Development (UNDP) Nigeria was the 13th poorest nation in the world based on the indices below.

- Standard of living
- Life expectancy
- Level of education
- Purchasing power as yardsticks for measuring economic performance.

Another aspect of economic problem that is being experienced today in Nigeria is unemployment (Okoye, 1987). The current wave of youth restiveness in the Nigeria Delta and the rifts in the North are all side effects of unemployment. We are not ignorant of lives lost, wasted manpower and
negative social impact it has on the nation. The question that comes to mind is: what are the strategies in mathematics education that should be adopted to help in achieving economic and social reconstruction. Before this pertinent question is examined, it is necessary to consider the importance of mathematics education and its relationship with science and technology.

Mathematics, Science and Technology Education

Mathematics, Science and Technology are so intimately linked: either could be the result or the course of other. Harness (1977), in this words: “technology answers the question of what can be made out of what is known (science) and mathematics defines the quantity and application of what is known”. The results of scientific research are easily understood when translated into mathematical language and without such research, technology cannot be in existence. The world today is fast becoming a global villages as a result of developments in information and communication technology. The key instrument in this globalisation is the computer. The invention of the computer machine, for instance, has its roots in mathematics. The linear programmer is indispensable tool in computer industry.

Considering the above importance and achievement of STM, what impact has it on our nation, Nigeria? Bearing in mind that STM, science and technology are indispensable components in economic and social reconstruction challenge, of which mathematics is fundamental to both. Integrating culture with mathematics, science and technology require a merging of school and society especially where the social and culture values plus technological orientation are absorbed into the school system. Such according to lyobhebhe (2002) has been the practice of developed countries in Europe and America that have built this technological orientation and culture into their societies over centuries. He further commented that inability of Nigeria to develop human resource in science, technology and mathematics over the years has shown itself in low productivity as manifested not only in high prices of industrial products in the domestic market but also in the slack competitiveness in the international market.

Achieving Economic and Social Reconstruction Through Mathematics Education

Adamu (1979) opined that mathematics is a man's creation out of his day-to-day activities. This shows that mathematics education has the great capacity for man's survival and for alleviating man's suffering. Thus, mathematics education can contribute effectively towards economic and social reconstruction through the following strategies:

- The teaching and learning of application of mathematics tools.
- Emphasising the relevance of mathematics modeling to real life problems.
- Establishing the mathematics culture.
- The usefulness of the acquisition of mathematical methods and techniques through proper mathematics education.

The Teaching and Learning of Application of Mathematics Tools

Alele Williams (1988) asserted that the teaching and learning of proper application of mathematical tools could significantly improve some aspects of our existence. Brian (1988) observe mathematical applications in manufacturing industry grew out of the need to cut costs, improve technologies in control labour. He further stressed that mathematics of light transmission in optical fiber is driven by interest in application in telecommunication. The useful application of mathematical tools in dress making cannot be quantified. A well tailored and error free dress making cannot be quantified, A will tailored and error free dress is a product of pattern drafting. Pattern drafting have been effectively and efficiently utilized in developed countries (Davies 1971). For proper and effective pattern drafting, the knowledge of mensuration, averages, ratios, and constructions etc are indispensable tools, the use of pattern drafting in dress making will help boost our economy through cutting down foreign expenditures.

Emphasizing the Relevance of Mathematics Modelling to Real Life Problems:

Adewoye (1988) stressed that mathematics education has not made effective impact on society especially in underdeveloped and developing countries. He then suggests that one way of rectifying this situation is by emphasizing the relevance of mathematics and mathematics modeling to real life problems. Madu (1993) discussed and illustrated the relevance of the study of mathematics in solving basic agriculture problems of water resources system management. He specifically focused on the mathematics methods used in studying the response of crops to irrigation water. Since irrigation is
effective in incremental food production in Nigeria. Knowledge of relevance of the study of mathematics in this regard would enable the increased production which would help in the development of the country economically and hence boost Gross National Product (GNP) of Nigeria, since that is the main occupation practiced by over 70% of rural Nigerians in agriculture.

Establishing the Mathematics Culture

Mathematics culture means the ability, readiness and willingness to always think and act logically to use implication, and logical deductions in our decision making process, to be free prejudices to behave and act in accordance with the laws of causes and effects, in fact to be scientific in our behaviour and mathematical in our thinking (Ukeje, 1990). Mathematical culture is the underlying structure for solving man's problems. These problems are basically all social ones and include feeding, clothing and housing moving from place to place. Then Nigeria can only be developed through appropriate scientific and technological means backed by sound mathematical culture resulting from proper mathematical education at all levels of the education system.

On Importance of the Quantitative Technique Acquisition Through Proper Mathematics Education

In order to reduce the problem of unemployment to its barest minimum, the Federal Government of Nigeria (FGN) has taken a lot of measures, an aspect of such measures is the introduction of prevocational and vocational courses in junior secondary school/tertiary institutions (Ohuchem, 1987). Students of vocation/business/technical education are compelled to take courses in entrepreneurship, with the aim of equipping them with entrepreneurial skill (Nwachorkor, 2002). Entrepreneurial talent demands quantitative techniques which involves the use of numbers, symbols and other mathematical expressions in decision making process (Kothari, 1978) some of the important operations research techniques often used those days in business and industry are: Game theory, linear programming, network analysis, simulation and several other techniques. The acquisition and application of the technique are made possible through mathematics education.

Recommendations and Conclusion

Mathematics education has played a very important role in advancing a nation to attain impressive heights in food production and conservation, waste, management, health, nuclear as well as space technology. Nigeria must pay serious attention to mathematics education, if they hope to get any where near the height so far attained by the developed nations. To this end, the problems that faced mathematics education must be tackled from the root. Such mathematics problems include: <*> inadequate and unqualified teacher, establishing mathematics laboratory in schools. <*> Adequate plans must be taken in training and retraining of mathematics teachers. <*> Teachers should strive to improve their classroom performance by employing learning enrichment materials and should also develop effective methods and skill that can stimulate students' interest in the subject.
<*> All the relevant operations research techniques should be combined to form more sophisticated and advanced programming models, which vocational business/technical students should undertake.

In conclusion every society needs to encourage mathematics education at all levels, considering its importance in economic and social reconstruction.

References


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