

Utilising Mathematics Skills in the Education System in Achieving the Millennium Development Goals (MDGs) in Nigeria

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Abstract

Achieving the Millennium Development Goals, by the year 2015 is possible if the challenges of extreme poverty, HIV/AIDS pandemic and mass illiteracy among others are overcome. Since the Mathematics as a tool for development is evident in all fields of human endeavour, its utility in a nation like Nigeria cannot be over emphasized. It also serves as the bedrock for development in all ramifications. This paper highlights the significant role of Mathematics in achieving MDGs as at when due.

Furthermore, the inability to apply Mathematical skills at various levels in the education system, in Nigeria affects national development. And it was recommended that providing the Mathematics education curriculum should be designed to meet the needs of Nigeria by raising the academic quality of the curriculum, particularly within the primary and secondary education sector.

Iji, Abakpa and Takor (2013) stated that any where human activities are carried out, there exist mathematics either as arithmetic, algebra, calculus, geometry, trigonometry or statistics that uses signs, symbols and/or proofs to describe relationships. On this basis, Otunu-Ogbisi (2009). defines mathematics teaching and learning as the act of imparting and acquiring of skills, knowledge, aptitude, abilities and attitude capable of making the individual functional and productive for effective all round achievement of a nations developmental goals. Mathematics, like any other subject is therefore seen to be important to the extent to which it supports and contributes to the purposes of general education (Oteze, 2011).

Odumosu, Oluwayemi, and Olatunde (2012) made a good attempt to enumerate mathematics application areas, as the carpenter's hammer, tailor's tape, artist's pencil, barber's clipper, hair dresser's comb, journalist's pen, broadcaster's microphone, doctor's stethoscope and lawyer's wig. They further qualified mathematics as an essential ingredient in manufacturing industries and essential tool in economic activities, bride of the sciences, chief bride's maid of social science ladies in waiting for engineering, cosmetology of arts and unavoidable servant of management sciences. In fact, the National Science Foundation (2009), in one of its briefings implied that the applications of mathematics to problem areas depend on the understanding of the concepts and the principles of mathematics by the problem solver.

Attaining the Millennium Development Goals (MDGs) which in the education sector is to eliminate illiteracy through basic education as well as maintain gender equality in the delivery of instructions in schools is a welcome development. The Universal Basic Education (UBE) Programme has enshrined these two goals in their objective which state to ensuring the acquisition of appropriate levels of literacy, numeracy, manipulative, communicative and life skills, as well as ethical, moral and civic values needed for laying a solid foundation for life-long learning, among others.

To be able to attain these MDGs before the 2015 deadline, different educations had recommended many avenues which included Science, Technology, Engineering and Mathematics (STEM) Education since the world today is embedded and governed by science and technology due to increasing discoveries, explorations, inventions and innovations (Jack, 2013). Acquisition of mathematical skills which emphasizes a purposeful study of mathematics and its application to the social and economic life of a nation also entails basic knowledge, skills, attitudes and values that are necessary for development. Mathematics education is therefore perceived as a major tool for rapid social and economic development. The more industrialized countries of the world utilized their mathematics to develop their economics. Local enterprises can still be competitive in the global trade environment with enhanced innovation and scientific content in their operations in all areas (Jack, 2013).

Mathematics as a school subject is taught solely for the purpose of developing the learner's habit of effective critical thinking, providing competence in the basic skills ability to communicate through symbolic expressions, ability to differentiate between relevant and irrelevant data, making relevant judgement, among others. Thus transferring the relevant skills learnt to everyday problem solving areas for individual self sustenance, wealth creation, entrepreneurship and national development which are necessary for the attainment of MDGs has been in difficult task. This paper therefore is to highlight how mathematics skills acquisition and its utilization have shaped the attainment of the Millennium Development Goals.

History of MDGs

In the year 2000, many world leaders from over 150 countries gathered at United Nations Headquarters in New York to brainstorm on the emerging realities of the moment. It has become clear to most of them that many United Nations resolution and development targets had reminded elusive while some important projects and programmes are either unimplemented or they could not yield the anticipated outcomes. The interactions, awareness and negotiations led to the United Nations establishing the Millennium Development Goals (MDGs) to guide plans and programmes of nations and development partners. The year 2015 was chosen as an important milestone at which point a comprehensive assessment of goal achievements would be made. The United Nations Development Programme (UNDP 2002) identified 8 major Millennium Development Goals (MDGs) to include eradication of extreme poverty and hunger, achievement of universal primary education; reduction of child mortality, improvement of maternal health, combating HIV/AIDS, malaria and other diseases, promoting gender equality; ensuring environmental sustainability and establishing a global partnership for development.

Mathematics skills and attainment of the MDGs

Otunu-Ogbisi(2009) noted that each of the MDGs needs the application of some mathematics skills and knowledge that are bedrock of all societal transformation and transfer of ideas into reality. This fact could therefore be extended to imply that mathematics being such an important element in the development agenda deserves some good attention if the achievement of the MDGs is anything to go by. Hence, the usefulness of mathematics in various fields so as to advice the Millennium Development Goals is highlighted as follows:

- Agriculture
- Education
- Gender Equality
- Health

Agriculture

The first MDG is concerned with poverty and hunger eradication and at the heart of the efforts to achieve it is agriculture. Mathematics skills and knowledge is needed in such area as measurement of land or area, average investment or expenditure, average return or income, production per unit area, cost of labour, time and work, seed rate, manure rate and so on. Also progress of a farm can be judged by drawing graphs of different items of productions.

The utilization of these mathematics skills will help in ensuring food security and ultimately lead to the eradication of extreme hunger and poverty.

Education

The second MDG is to achieve the universal primary education of both boys and girls everywhere; just as education is the bedrock of all sciences that transform a nation. Oteze (2011) noted that mathematics teaching can be structured such that knowledge is built on a foundation which ensures that learning grows out of useful experiences and experimentation, Ugboaja (2011) stated further by saying that the proper and meaningful study of mathematics should assist the individual in ordering, organizing and investigating his/her environment. Mathematics skills therefore will enable the children and other individuals who went through Universal Basic Education to calculate easily and be involved in mental processes in reasoning so as to develop and transform the nation.

Gender Equality

The third MDG is concerned with promoting gender equality and women empowerment. There has been a renewed debate on the controversial issue of gender differences and practices in the mathematics classrooms. This debate currently focuses on why variation exists between male and female achievement needs in the classrooms especially in science, mathematics and technology. (Liver, Davis-Kean & Eccles, 2004). However Okeke and Menkiti, 2014 have found out that if innovative techniques and materials are used, it improves and enhances students' achievement in mathematics irrespective of the gender. This bridges the gender gap in student's mathematics achievement especially at the basic education level. This will enhance mainstreaming of women to acquire mathematics skills alongside with the men in participating and going access to credit and land ownership.

Health

The fourth, fifth and sixth MDGs are all health related. These include reducing child mortality, improving maternal health combating HIV/AIDS, malaria and other disease. Mathematics skill is an essential tool for any professional within the health sector. According to Nusa beam, (2006) in Abubakar, Wokoma and Afebuome (2011), mathematics skills needed in the health sector include basic mathematical knowledge sufficient to calculate drug doses, concentrations, an understanding of the care statistical concepts most commonly represented in the medical literature, knowledge of algebra to understand calculations of acid base status, ability to appreciate whether or not result are mathematically plausible. The utilization of these skills in the health sector has made government's health care delivery system to be very efficient thereby leading to the attainment of the Millennium Development Goals.

The seventh MDG is all about environmental sustainability. Sustained efforts needs to be geared towards training enough environmental workers in quantitative and Information, Communication and Technology (ICT) skills to disseminate safe hygiene and drinking water practices so as to prevent the spread of communicable diseases.

The eight MDG is about global partnership for Development. The public and private sectors of the economics donor agencies, civil society groups, science, technology and mathematics are enveloped in a partnership to bring about a sustained development. Since as Ugbebor (2009) right professed that, mathematics is the language of science and technology, acquisition and utilization of mathematics skill is very inevitable in the development agenda. Ibidapo-obe (2011) further buttressed this fact when he said that scientific knowledge is fundamental to addressing the critical issues of economic transformation and globalization, reduction of unemployment, poverty, hunger, disease and the sustainable use of natural resources facing the world today.

Conclusion

The sustained prosperity of a nation depends upon the level and quality of its education system. Education empowers individuals and maximizes national intellectual resources in order to sustain social and economic progress for the benefit of all. Access to free compulsory education is a right and nations must address the appropriate length of the educational experience to meet national need for the development of their intellectual capacity. The attainment of the Millennium Development Goals through a robust mathematics education programme is a sin-qua-non if we hope to accomplish the goals in the other segments such as improvement in the health of the people, control of HIV/AIDs pandemic and poverty alleviation.

Recommendations

1. The existing mathematics teachers should know what MDG is all about and should be interested in attaining some if not all its benchmarks with minimum stipulated time.
2. All teachers should be encouraged to be gender sensitive and accommodating by encouraging all the students irrespective of sex role that they can all perform a given task in the same way.
3. Mathematics teachers should be encouraged to use appropriate instructional materials in teaching mathematics topics/concepts in order to link learners' past experiences and daily activities with classroom instructions. This is believed will enhance problem solving, communications reasoning and the needed connections to achieve the Millennium Development Goals.
4. The government programme on free and compulsory basic education should be properly implemented to enable all school-aged children to get access to formal mathematics education.
5. The mathematics education curriculum should be designed to meet the needs of Nigeria i.e. by raising the level of academic quality of the curriculum particularly within the primary and secondary education sector.

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