Review

The teaching of mathematics in secondary schools as a tool for self-reliance and re-branding process in Nigeria

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Mathematics teaching is an interaction between the teacher and the learners that leads to acquisition of desirable mathematical knowledge, ideas and skills necessary for applicability in our everyday life. This paper therefore looks at the concept of self-reliance, the concept of mathematics teaching, problems and prospects of mathematics teaching and finally takes a look at mathematics as a tool for self reliance in solving our daily problems for the re-branding process in society.

Key words: Chinese local MBA, Learning approaches, management graduate students, deep and surface learning approaches.

INTRODUCTION

Mathematics as a tool for national development, Ilori (1994) stated that societies and government around the world recognises the importance of mathematics for 'national development'. The fabric of society has become more and more underpinned by mathematical ideas. As a result, a major development in mathematics education in this millennium has been the increased amount of mathematics that all citizens are expected to know. Technological leaders and political leaders need mathematics education that takes into account both the new uses of mathematics and technology and new ways in which mathematics can be done with information technology.

Wherever a person belongs in a society, he utilizes knowledge of mathematics in one form or the other. Not to speak of a president of a nation, an engineer a businessman, an industrialist, a banker and a financer or a finance minister; a planner or a boss in a parastatal, even a labourer has to calculate his wages, make purchases from the market and adjust the expenditure to his income. Whosoever earns and spends uses mathematics. Counting, notation, addition, subtraction, multiplication, division, weighing, measuring, selling,

buying and many more are simple and fundamental processes of mathematics which require immense practice. The knowledge and skills in these processes can be provided in an effective and systematic manner only by teaching mathematics in schools (Kulbir, 2006). Despite its utility, mathematics has been one of the subjects which Nigerian students especially at secondary schools level develop dislike for and likewise perform poorly (Odili, 2006). The re-branding process in Nigeria which was launched by the former president Umaru Musa Yar'adua on March 17, 2008, was directed towards positive perception of Nigeria at home and abroad. At the launching, the president described the "Re-brand Nigeria Campaign" as a re-awakening call on every Nigerian irrespective of tribe or religion. Re-branding Nigeria is a philosophical approach that can compel a change in the negative perception of Nigeria's image at home and abroad (Salisu, 2009). The big question is, "what can be done to improve the teaching and learning of mathematics being a tool for self-reliance in Nigerian Secondary School system in order to re-brand Nigeria as a society? Kolawole and Oluwatayo (2004) stated that the more knowledge of mathematical concepts with the corresponding knowledge of their application to real life seems to be deteriorating.

To develop scientifically, technologically, economically, politically depends on the manpower the country has acquired.

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This man power includes the mathematics teachers, engineers, medical doctors, technologist and others. In order to produce future scientist and technologists in quality and quantity that are self-reliant, the knowledge of mathematics is paramount. However, students and people frequently ask these questions; How can the teaching and learning of mathematics be improved in our secondary schools as a tool for self-reliance? What importance is mathematics in achieving the Late Yar'adua Re-branding campaign? Therefore this paper takes a look at the concept of mathematics teaching, problems and prospects of mathematics teaching and mathematics as a tool for self-reliance for re-branding the process in Nigeria society.

The concept "self-reliance"

According to Oxford Advanced Learners Dictionary (2001), self –reliance is seen as a person who is able to do or decide things by himself rather than depending on other people for help or assistance. The Oxford African Encyclopaedia for Schools and Colleges (1974) looks at self-reliance as a person that does not rely on any person, he performs independently to achieve his pre-determined goals. Therefore "reliance" is seen as an individual who is able to do, decide things and act independently to achieve his predetermined objectives.

The concept "mathematics/teaching"

Odili, (2006) defines mathematics as a body of knowledge, a collection of techniques and methods, the product of human activity for solving problems. Oxford Advanced Learners Dictionary (2001) defines mathematics as the science of size and numbers (which arithmetic, algebra, trigonometry and geometry are branches).

New Encyclopaedia Britanica defines it as the science of structure, order and relation that has evolved from elementary practices of counting, measuring and describing the shapes of objects. It deals with logical reasoning and quantitative? Mathematics is a major aspect of our educational system since its application cuts across all areas of human endeavour. For instance from social or economics perspective mathematics is a key element in our day-to-day living that every human being practices in one form or the other.

Teaching as seen by Kalu (1999) is an activity which enables pupils or learners to learn and acquire the described knowledge, skills and disposition necessary for becoming functional members of the society Bidwell (1993) viewed teaching as a series of interaction between the teacher and the learners with the explicit goal of changing one or more of the learner's cognitive or effective states. Therefore, mathematics teaching can be seen as the interaction between the teacher and the learners to acquire the described mathematical knowledge, skills, ideas necessary for becoming functional members of the society.

Problems and prospects of mathematics teaching in Nigeria secondary schools
Problems of mathematics teaching

Despite the effort of the government on the development of mathematics teaching and provision of opportunities for the improvement of teaching, there are still problems of mathematics teaching and learning. Odili (2006) outlined some of these problems as follows:

1) Lack of curriculum integration.
2) Shortage of mathematics teachers.
3) Lack of instructional materials.
4) Poor government policy.
5) Poor classroom organisation by teachers.
6) Lack of equipped mathematics laboratory for practical.
7) Over population of students which may impedes effective demonstration during practical.
8) Teachers impatience and un-preparedness.
9) Poor remuneration of teachers.

Prospects of mathematics teaching

Looking at the numerous achievements recorded in mathematics education in Nigeria in the 21st century, there are more challenges ahead of mathematics teaching. There have been efforts in mathematics curriculum development to correct these problems, but there appears to be more challenges in mathematics teaching and learning as summarised:

i) With the establishment of more institutions and efforts of ministries of education, there is possibility of improving mathematics teacher's supply in the near future.
ii) With the knowledge of mathematics, sciences and technology and in particular the mathematics application to the development of the society is the centre piece of essence of engineers, Technicians and scientists clubs and national competitions. To stimulate creativity, improvisation, interest in mathematics and technology and productive work in and out of school.
iii) With the establishment of more institutions and efforts of ministries of education there is a possibility of improving teachers supply in the near future.

Mathematics as a tool for everyday living

Mathematics is quite rich in concepts which directly translate to proper life skills. The importance of mathematics to everyday living cannot be over emphasized. The mathematics curriculum in Nigerian secondary schools is developed

and structured around four major concepts Number and Numeration, Algebraic processes, Geometry, and Menstruation and everyday statistics (Kolawole and Oluwatayo, 2004). These concepts have direct bearing on people's way of life.

Taking the concept of commercial arithmetic under numbers and numerations, several life skills that can be taught ranges from how to prepare "ready reckoners" for some groceries at shops, how to budget wisely and be able to live within one's means. It helps both wives and businessmen and women to do their business effectively. It also helps to describe the population of a country, a state, a Local Government Area, a town or a family.

The concept of time can be understood by the use of clock; the time to wake up is indicated by the use of the clock. It is the clock that indicates the time to wake up in the morning, prepare for school, have recess, have specific lessons, time to complete studies, get married, retire from the public or private service, etc. These helps to plan and make life worth living.

The concept of length helps one to determine the size of his/her shoes, shirts, pieces of cloth required to sew a garment, determine the distance between two towns or villages. The knowledge of weight helps to determine the number of kilogramme of meat required to prepare a delicious soup for a family.

The concept of ratio and proportion has wide range of applications in chemistry, especially in the balancing of chemical equations and mass-volume relationships. Furthermore, the application of ratio and proportion had been recognized in taxation, income tax computations, import and export duties, exercise and local duties and insurance. The use of chemical for either weed or pest control require a sound knowledge of ratio in mixing the chemical. Similarly a mason requires the knowledge of ratio and proportion for mixing of concrete.

The problems involving inequalities frequently occur in industry and in ordinary life. Many of these problems can be solved graphically and solutions reached. For small and large business to thrive it must minimize cost and maximise profit and this requires the use of linear programming.

Re-branding the transport industry requires developing the transport system to match the intended modernization. This will result in development and effective use of the railways, airways, waterways and roads for transportation of goods within the country. Here, a lot of mathematics is used directly and indirectly in developing these networks of transportation. The marking and construction of play fields, courts and pitches for athletic track, football, basket ball, hockey and others, require the knowledge of geometry such as Pythagoras theorem, constructions, measurement of angles and so on.

The knowledge of geometry is a mathematical model of shape, size patterns and motion in two and three dimensions (Kolawole and Oluwatayo, 2004). For example,

in measuring both local and global distances, the knowledge of geometry is very vital.

In buying a carpet for the home, even in estimating the number of cement blocks required to build a house, we cannot do without geometry. The mason requires the knowledge of geometry for setting of foundations and its constructions. An individual can be re-branded with the use of mathematical concepts to cut, cost, save time and maximise profit without compromising standard or quality. The concept of variation, (direct, indirect, joint and partial variations) had been found vary useful tools in economics, sciences, technology, industries and others. Direct variation can be useful to tailors, the more the time he spends on a design the more amount of money he charges the owner of the cloth. Similarly, indirect variation is a useful tool for teaching population education. For example, the larger the population of a family, the less attention or care is given to members. Partial variation is also used to determine the total cost of electricity bill in a house. The Power Holding Company of Nigeria (PHCN) uses the concept of partial variation to work out the PHCN bills per month. The cost of servicing meter is usually constant or fixed while the cost per unit of electricity consumed during a month depends on usage of the electricity for the month, which varies. Statistics, deals with collection, organisation and interpretation of information based on the number of things. It makes possible, advances in science and technology as well as supplying framework for improved decision making in management and public affairs. It is very important for educational planning and budgeting, statistics helps us to know the pupil -teacher ratio, number of drop outs, enrolment ratio and prediction of out- come of educational programmes. Governments use statistics to know the population of a country, state or local government area for sharing of amenities, planning and managing resources.

The application of probability in re-branding the Nigeria citizenry for self-reliance is very important. Ability to predict the outcome of an election or the possibility of winning a war or football match. It is used for forecasting weather based in previous events. The applications of mathematics for everyday living are numerous and cannot be exhausted. When these applications are used in the process of teaching and learning, it will help to make the students better and hence a better citizen in the society.

Odilli (2006) sees mathematics as a subject that helps students to form the habit of clarity, brevity, accuracy, precision and certainty in expression and this will go along way in giving us the much needed unity in this country. In preparing students for life, we may consider the power of mathematics in character building. It also demands hard work from the learner, which is what is much needed in our society today in line with the re-branding agenda.

CONCLUSION AND RECOMMENDATIONS

Teaching and learning of mathematics for life skills and self reliance implies making the learners see mathematics beyond the classroom boundaries. It means that learners must be brought to the real world of issues and relate the mathematics they learned to the realities of life. The essence of teaching and learning mathematics for self-reliance is to promote responsible citizens as a sure way in the re-branding process.

Based on this research work, the following recommendations are made:

1) Mathematics teachers should endeavour to relate mathematics concepts to real life situations.
2) Government should employ more mathematics teachers and supply adequate instructional materials and equip mathematics laboratory for effective teaching and learning of mathematics in Nigerian secondary schools.
3) Mathematics curriculum planners should ensure that, there is proper integration of the curriculum in all secondary schools in Nigeria.

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