

## DEVELOPING ENTREPRENEURIAL SKILLS THROUGH SCHOOL MATHEMATICS EDUCATION

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### **Abstract**

The paper explains the meaning of entrepreneurial skills and how it can be developed in students through mathematics. It highlights the importance of mathematics in science and technology which is the panacea in the development of science and technology in the country. It emphasizes that for effective development of entrepreneurial skills in students through mathematics, the present method of teaching mathematics which are teacher-centered, drill and rote learning must give way for more effective methods of teaching like students-centered, problem solving and problem-based learning which has the ability of developing in the child a creative mind which is a major factor in developing entrepreneurial skills in students, hence, the place of mathematics education in developing entrepreneurial skills.

### **Introduction**

Mathematics education in Nigeria has come a long way. In the traditional society before the introduction of formal education, mathematics was used mainly in taking stock of daily farming and trading activities. Most traditional societies have their counting system which was either module five or twenty. These could be seen in market days and other counting systems. The methods of teaching then was practically oriented topics like numbers and numeration, geometry where taught using practical method through construction of houses and measurement of farm lands.

However, the coming of the missionaries introduced formal education in Nigeria in 1942 (Obodo, 1997). In this system of education mathematics occupied a central position in the school curriculum. This has remained the position in the Nigeria education till today, even with the introduction of 6-3-3-4 system of education. In this system, mathematics is a core subject from primary to secondary level of the education system. This important position occupied by the subject in the school curriculum is borne out of the role of mathematics in scientific and technological development (Baiyelo,

1987) which is the basis for developing entrepreneurial skills.

### **Objectives of Mathematics Education as the Basis for Developing Entrepreneurial Skills.**

The report of the mathematics conference held in Benin between 6<sup>th</sup> to 7<sup>th</sup> January 1976 gave the summary of the National Objectives of primary and Secondary Education as it relates to mathematics education to include:

1. to lay a solid foundation for the concept of numeracy and scientific thinking,
2. to give the child opportunities for developing manipulative skills that will enable him function effectively in the society within the limits of his capacity,
3. to develop in the child the ability to adapt to his changing environment
4. to provide the basic tools for further advancement as well as prepare him for trades and crafts of his locality,
5. at the secondary level, to build on the foundation of the primary level, so that the child can make a useful living professionally, economically, politically and socially.
6. secondary education should also prepare the child for higher education (Nwosu 1976)

### **Entrepreneur and Entrepreneurship Skills.**

To Frank (1967) and Peter (1970), entrepreneurship is about taking risk. The behaviour of the entrepreneur reflects a kind of person willing to put his or her

career and financial security on the line and take risk in the name of an idea, spending much time as well as capital on an uncertain venture. The act of entrepreneurship is often associated with true uncertainty particularly when it involves bringing something really novel to the world, whose market never existed.

An entrepreneur is a person who is willing and able to convert a new idea or invention into a successful innovation. Entrepreneurship forces across market and industries, simultaneously creating new products and business model. Entrepreneurship is widely regarded as an integral player in the business center and economic growth.

### **The Role of Mathematics in Science and Technology as the Basis for Developing Entrepreneurial Skills**

Developing entrepreneurial skills in students is not independent of science and technology for which mathematics is its bedrock. Baiyero (1987) observed that mathematics is widely regarded as the language of science and technology. This observation was also made by Abiodun (1997) when he stated that while science is the bedrock that provides the spring board for the growth of technology, Mathematics is the gate and key to the sciences. Ukeje (1997) in acknowledging the importance and contribution of mathematics to the modern culture of sciences and technology stated that “without mathematics there is no science; without science there is no modern technology and without modern technology there is no modern society”. In other words mathematics is the servant and

the queen of science and technology and the indispensable single element in modern societal development.

Science and technology is needed for developing critical and creative mind in students which are factors that are necessary to develop entrepreneurial skills in students, and then mathematics education is an indispensable tool for developing entrepreneurial skill in students.

Since the introduction of formal education in Nigeria, mathematics education has gone through several reforms, from the period of tradition mathematics through the era of modern mathematics to the present new general mathematics. This reform had always been necessitated by the realization of the role mathematics should play in scientific and technological development as well as responses to societal needs and demands. (Aguele, 2004).

Mathematics as observed by Abiodun (1997) is the major tool available for formulating theories in the sciences as well as in other fields. It is used to explain observation and experiments in other fields of inquiry. Adeyegbe (1987) observed earlier that there is hardly any area of science that does not make use of mathematical concepts to explain its own concepts, theories or models. Thus any one who neglects mathematics may not be able to go far in the sciences and in fact, other things of the world.

Practical work and observation of nature are the main source of scientific discoveries. Mathematical methods play a very important role in this. Mathematical

methods lie in the foundation of physics, mechanics, engineers, chemistry and so on.

According to Bermant in Harbor-Peters (2000), an important feature of the application of mathematics to sciences is that it enables us to make scientific predictions that are not drawn on the basis of logic and with the aid of mathematical methods, correct conclusions whose agreement with reality is then confirmed by experiences, experiments and practice. Thus, mathematics is the bedrock of science and technology, which is the springboard for the development of entrepreneurial skills.

Mathematics today is having an enormous impact on sciences and society. The influence may be silent and appear hidden but has shaped our world in many ways. Mathematical ideas have helped make possible the revolution in electronics, which has transformed the way we think and live today. The Information Technology (IT) of today has transformed the world into a global village. These advances in science and technology are made possible by the numerous developments in pure mathematics. Mathematical sciences have helped improve the ability to predict weather, to measure the effects of environmental hazards, projects the outcomes of electrons etc. Mathematical methods, structures and concepts have become indispensable to the functioning of the technological society. Indeed, in this period of hi-technology and internet super highway, no nation can make any meaningful achievement particularly in

economic development without technology, whose foundations are science and mathematics.

In the present age of science and technology, the development of entrepreneurial skills is largely dependent on science and technology which is also dependent on mathematics. Ukeje (1997) observed that improved scientific knowledge and the availability of modern technology even if indigenous will certainly increase economic productivity and viability. However, the state of science and technology is a function of the development and application of mathematics. Reference could be made of the ever-growing mathematical concepts and systems that are being applied effectively for the service of man. Examples of this abound in areas such as the application of system analysis to achieve cost effectiveness in various industrial and management systems, utilizations of fuzzy logic and fuzzy control for equipment manufacturing and economic in the solution of economic problems.

Today mathematics in its various forms had found application in economic, sciences, chemical and energy development, engineering and technology that it has become a variable and indispensable tool in the development of entrepreneurial skills.

### **Mathematics Education and Entrepreneurial Skills**

For mathematics education to take its proper place in developing entrepreneurial skills in our students, the

present methods of teaching mathematics in our schools which are expository, rote learning/memorization, recitations, large group instruction, drill etc must be dropped. This method according to Bot (2007) emphasizes the development of mathematics concepts and computational competences among learners using standard rules and procedures at the detriment of genuine understanding. They deny the learner active involvement and participation in the learning process because the teacher always provides explanations for any mathematical thinking and reasoning. These consider only the second faces of mathematics education.

However mathematics education must cover the four faces of mathematics to be able to develop entrepreneurial skills in students. The faces of mathematics according to Keith Delvin (2000) are:

- Mathematics as computation formal reasoning and problem solving
- Mathematics as a way of knowing
- Mathematics as a creative medium
- Application of mathematic.

This can only be possible if the teaching of mathematics will go beyond rote learning, drill and teacher centered approaches which is the case in our schools today, methods that make the learner to be actively involved, and give them genuine understanding of concepts should be used. These are students-centered, problems solving and problems-based learning.

These methods of teaching mathematics will shape the thinking of the learner and arouse his curiosity to find out

what is happening around him, to discover opportunities and utilize them, which are basic qualities of an entrepreneur.

### Conclusion

For Nigeria to be able to achieve the 1<sup>st</sup> MDG which is; eradication of extreme hunger and poverty by 2015, then the need for the development of entrepreneurial skills in our students can not be overemphasized. Since developing people that will be able to look around and make use of opportunities to be self-reliant is only possible with science and technology whose bedrock is mathematics, mathematics education should therefore take up the challenge of developing entrepreneurial skill in students through appropriate methods of teaching mathematical concepts.

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