
POTENTIAL OF MATHEMATICS IN SCIENCE AND TECHNOLOGY

USEFUL FOR ECONOMIC EMPOWERMENT IN NIGERIA

OGOCHUKWU AGATHA AKUNNA

DEPARTMENT OF STATISTICS

FEDERAL POLYTECHNIC OKO, NIGERIA

akunnaogo@yahoo.com; +2348037145614

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BIBIANA NKIRUKA ONWUBUMPE

DEPARTMENT OF STATISTICS

FEDERAL POLYTECHNIC OKO, NIGERIA

onwubumpebibian@gmail.com; +2348020991599

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Abstract

The paper discussed on the relevance of mathematics in science and technology, which in turn is beneficial for economic empowerment in Nigeria. Issues addressed in the paper are: need for economic empowerment in Nigeria, science and technology as a means of economic empowerment, potential of mathematics in science and technology, ensuring quality mathematics education. The paper pointed out that: the economic hardship in Nigeria, which is associated with unemployment, can be ameliorated through engaging in entrepreneurship for economic empowerment; science and technology is associated with economic empowerment because it is applied in provision of goods and services needed for generation of income, mathematics is relevant in enhancing operations in science and technology because mathematics serves as a language of science and technology; fostering effective use of mathematics in science and technology demands that all stakeholders in mathematics education should be diligent in ensuring quality mathematics education. The paper made some recommendations on the basis that mathematics is valuable in science and technology useful in ensuring economic wellbeing of the populace in Nigeria. The paper concluded that mathematics has economic value since it is utilized in science and technology useful for economic empowerment.

Key Words: mathematics, science and technology, economic empowerment, entrepreneurship, income

Introduction

In this era of oil subsidy removal, Nigeria is a nation experiencing economic hardship, aggravated by unemployment. To wage war against the economic hardship, it is necessary to ensure economic empowerment of the masses. The purpose of economic empowerment is generation of income. Economic empowerment is a situation by which one has means of generating income to handle financial needs for a happy living and it can be achieved through entrepreneurship (Odo & Ifeachor, 2024).

To encourage economic empowerment in Nigeria, utilization of science and technology in entrepreneurship is very essential. Akunna and Onwubumpe (2019) acknowledged that a means by which a nation with developing economy can enhance productivity geared towards becoming a nation with developed economy is having strong focus and anchor in science and technology. Science focus on the study of natural phenomenon while technology deals with utilization of knowledge obtained from science in production of materials and devices to make human environment conducive and pleasant (Onwubumpe & Obiora, 2024).

An essential discipline for effective operations in science and technology is mathematics. Acquisition of deep knowledge in mathematics demands fostering quality mathematics education and that pertains to ensuring great interest and diligence in the teaching and learning of mathematics.

The paper is a discussion on the relevance of mathematics in promotion of science and technology needed in ensuring economic empowerment in Nigeria. Issues the paper discuss are:

need for economic empowerment in Nigeria, science and technology as a means of economic empowerment, potential of mathematics in science and technology, ensuring quality mathematics education. Certain recommendations are made in the paper.

Need for Economic Empowerment in Nigeria

It is painful that a lot of people in Nigeria, mostly youths with higher education, are experiencing economic hardship because of unemployment. Nigeria Millennium Development Goals Report of 2013 has it that two-third of Nigerians are living in poverty and unemployment rate is 37.70 percent (Ogbogu, Okagbare and Oluwatobi, 2017). Unemployment is a painful economic problem for it can lead people to suffering and engaging in social vices that can retard socio-economic development. Onyishi (2015) pointed out that unemployment could lead to frustration and cause a graduate engage in armed robbery or prostitution due to idle mind. The unemployment, associated with economic hardship being experienced in Nigeria, calls for economic empowerment by encouraging entrepreneurship.

Simply stated, entrepreneurship is establishment of business serving as a self-employed job for obtaining of income (money). Effiom (2017) stated that operationally, entrepreneurship is the willingness and ability of a person or persons to acquire educational skills to explore and exploit investment opportunities, establish and manage a successful business enterprise. According to Nwosu, Nnabuenyi and Igwe (2015), entrepreneurship borders on self-reliance for it is establishment of business in which one works as self-employed person for the purpose of making a living and solving people's needs. Kennedy (2014) explained that entrepreneurship is more than simply 'starting a business' for it demands that an entrepreneur should identify opportunities, allocate resources, and create value by the identification of unmet needs/opportunities for change.

Oviawe in Ezeife and Amechi (2021) noted that entrepreneurship is important in ameliorating some socio-economic problems especially poverty, unemployment and all sorts of social vices in the society. Fostering entrepreneurship requires the use of science and technology.

Science and Technology as a Means of Economic Empowerment

Science and technology has greatly influenced human activities in this modern era such that it can be employed for economic empowerment. It is hard and perhaps impossible for self-reliance and sustainable development to be witnessed in a nation without a cling to science (Nwosu, 2016). Aigbe and Omidih (2016) acknowledged that technology is the: knowledge used to change various resources into many goods and services used by a society; application of scientific principles to produce products needed by a particular society. Due to potential in science and technology, advancement for the wellbeing of man has been made in agriculture, health care, modern communication, transportation, automation, computerization, etc (Akunna & Onwubumpe, 2019).

The application of science and technology for economic empowerment can be in provision of goods and services. Engaging in provision of goods and services can be associated with entrepreneurship, usually serving as a source of making income for comfortable and enjoyable living. Effiom (2017) emphasized that in this period characterized by science and technology, entrepreneurial skill development is hinged on science and technology. A prominent aspect of science and technology in this modern era is electronics. As pointed out by Okoli and Nwosu (2021), electronics has the potentials to enhance entrepreneurship because it can: provide electronic-based jobs, promote acquisition of entrepreneurial education, enhance work productivity, and boost business communication by entrepreneurs. In the same vein, Odo and

Ifeachor (2024) explained that electronics has made it possible the emergence of computer; and computer can boost entrepreneurship for economic empowerment because it can be utilized to: store information that can be retrieved, increase work productivity, offer educational value, and provide security. For promotion of science and technology needed for economic empowerment, utilization of mathematics is very beneficial.

Potential of Mathematics in Science and Technology

Mathematics is a field of study that employ objective reasoning in making calculations, analysis and drawings. Nwosu in Akunna and Onwubumpe (2019) stated that mathematics is a subject or discipline that deals with measurements, calculations and geometrical drawings; and critical thinking and analysis characterize its activities.

Mathematics is needed to understand some phenomena and concepts in science and technology. So, mathematics can be taken as the language of science and technology. Some of the uses of mathematics in science and technology are determination of unknown parameter, plotting and interpreting of a graph, derivation of formula, simulation and modeling, analysis and interpretation of raw data, and drawing of shapes (Nwosu, Oguagbaka & Akunna, 2015).

By virtue of mathematics being useful in science and technology, it can be seen as a resource that supports economic empowerment. Iji, Ogbole and Uka (2014) pointed out that everybody uses mathematics in one way or the other in solving life problems. Nations that desire high level of ingenuity in scientific and technological activities must ensure that the populace are adequately equipped with deep knowledge of mathematics. It can be deduced that effective use of mathematics in science and technology demands promotion of mathematics education.

Ensuring Quality Mathematics Education

Mathematics education can simply be viewed as activities concerned with teaching and learning of mathematics in schools. It is painful that mathematics education in Nigeria is not in a satisfactory state. Iji, Ogbole and Uka (2014) observed that mathematics education in Nigeria is in a depressed and worrisome state and there is mass failure of students in mathematics at the external examination. By virtue of mathematics being relevant in economic empowerment through its use in science and technology, it is necessary to ensure quality teaching and learning of mathematics in Nigeria through being diligence and focused by all stakeholders concerned with teaching and learning of mathematics.

Among the major stakeholders in mathematics education are mathematics teachers. Teachers are indispensable in actualization of quality education in that no educational system can rise above the levels of its teachers for they serve as the input resource in the teaching-learning process (Onwubumpe & Obiora, 2024). Mathematics teachers, as essential human resources, should be intellectually bright and morally good, and show sense of diligence in the teaching career. It is expected that teaching of mathematics should be such that can improve interest and academic achievement of students. A means to ensure quality education is avoiding teaching mathematics only on theoretical basis. Mathematics should be taught in a practical way through the use of instructional materials, which can be standard or improvised ones. Instructional materials appeal to more human senses; such results to better understanding of an education topic.

Other human resources that serves as stakeholders concerned with fostering quality mathematics education are students, the government, educational administrators and the general public (the home, media, the populace). Students studying mathematics should be highly focused in their study and avoid any form of distraction that will make them not to be dedicated in their

academic programme, bearing in mind that their performance serves as the output in the educational programme. The government and educational administrators should contribute towards ensuring quality mathematics education by adequately encouraging and motivating mathematics teachers for excellent jobs; they should ensure availability of adequate equipment and facilities needed for effective mathematics education. The general public can contribute towards promoting quality mathematics by avoiding any form of illegal and corruptive acts that can retard effective mathematics education; they should earnestly desire and participate in activities that can enhance quality in mathematics education.

Recommendations

Based on the value of mathematics in science and technology beneficial in ensuring economic empowerment in Nigeria, it is recommended that:

1. Science-based students and teachers should be highly devoted in deep study and acquisition of knowledge of mathematics.
2. Various human resources such as government, school administrators and the general public should put in their best for quality education in mathematics.
3. The masses in Nigeria should strongly value and embrace ethical life that will help foster the use of science and technology for economic wellbeing of the citizenry.

Conclusion

Alleviation of economic hardship in Nigeria requires economic empowerment aimed at generation of income. Economic empowerment can be through the use of science and technology in boosting entrepreneurship. It then implies that science and technology has economic value since it can promote self-employed job for making of income.

For effective operations in science and technology, mathematics is valuable for it serves as the language of science and technology. The application of mathematics in science and technology shows that mathematics is a discipline with economic value for it has a bearing with economic empowerment. Mathematics being valuable in science and technology needed for economic empowerment calls for promotion of quality mathematics education in Nigeria.

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