

THE PLACE OF MATHEMATICS EDUCATION IN ADDRESSING ENTREPRENEURSHIP DEVELOPMENT AND JOB CREATION IN NIGERIA

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Abstract

Entrepreneurship and job creation development has become a great concern to mathematics educators in view of the unprecedented increase in unemployment in Nigeria. The basic problem in mathematics education is how to make students apply mathematical knowledge and skills in future outside the classroom context. Mathematics education provides a solid foundation for everyday life in individual by developing the ability of precision, logical, abstract thinking and ability to be accurate in solving real life problems. Entrepreneurship and job creation encourages self employment or self-reliance which depends highly on the proper acquisition of knowledge and skills in mathematics education. Entrepreneurs have the passion among other traits that enhance their business because the business creates jobs for them and they believe that their business success is their personal success. The paper discusses on the meaning of entrepreneurship, entrepreneurship development in Nigeria, mathematics education and entrepreneurship development, and factors that enhance entrepreneurship and job creation in Nigeria. If the individual has mathematics skills and knowledge, he can take decision on his own, consultant and could be able to solve problems hence he can stay on his own as an entrepreneur. He can be an employee of mathematics educators.

Keywords: Mathematics education, Entrepreneurship development, Job creation, Nigeria

Introduction

Mathematics is an activity oriented subject to which practical activities that involve individual participation is very important. Chado and Zakiriyya (2013) observed that without mathematics, there will be no Science, without Science there will be no technology and without technology there will be no modern society. Kurumeh and Imoke (2006) described mathematics as the queen of science and technology. According to Odiogo (2009), mathematics sharpens the mind and gives individual the ability to react in the right direction in times of need. Mathematics gives more power to individual thinking. Mathematics was in use even before the advent of formal education in taking daily stock of trading and farming activities in the society. Okafor (2012) stated that Nigeria Transformation Agenda cannot be sustained without mathematics because mathematics has economic value, since no business can thrive effectively without mathematics. Mathematics remains a subject that equips learners with knowledge and practical skills

needed to interpret, simplify, solve problems, assess risks and make proper decision in life. Mathematical activities are the bedrock of technology and entrepreneurship venture. It is virtually found in every sphere of human endeavour (Tsafe, 2012).

According to Fadare (2010), show me a man who does not need mathematics and I will show you a man that is dead but not yet buried. This is because the tomato sellers, petrol pump attendants, taxi drivers, typists carpenter/ furniture makers, barbers, traders in general and the employers at one time or the other apply mathematics in their daily work and transactions.

Abakpa and Agbo-Egwu (2014) pointed out that mathematics develop life-long skills in the learners that enable them contribute meaningfully to the development of the society. Skill is the means by which an individual adjusts to life. The mathematics skills include computation, numeracy, multiplication, problem solving, approximation, estimation and measurement. According to Federal Republic of Nigeria (2004) one of the objectives of mathematics education is acquisition of appropriate skills (entrepreneurial skills), abilities and competences both mentally and physically as equipment for the individual to live and contribute to the development of his society. Obrien (2002) in Abakpa and Agbo-Egwu (2014) stated the broad goals of mathematics education in Nigeria as follows:

- Transmitting arithmetic skills (computational skills in problem solving and measurement)
- Developing skills in thinking creativity to handle abstractions.

These demonstrate the importance schools and Government attach to teaching and learning of mathematics in order to achieve functional education that promotes entrepreneurship development.

Alio and Okafor (2015) defined education as a form of learning in which knowledge, skills and habits of a group of people are transferred from one generation to the next generation through teaching or research. Mathematics education is the practice of teaching and learning mathematics along with problem solving techniques and issues relating to curriculum (Ugboduma and Alio, 2014). Mathematics education is a tool for economic development. Otunu-Ogbisi (2009) described mathematics Education as the acquisition of skills, knowledge, aptitudes, abilities and attitude capable of making the individual functional and productive for effective all round achievement in the development goals. Alio and Okafor (2015) stated that no nation can advance economically and technologically without laying emphasis on teaching and learning of mathematics education. Mathematics education promotes thinking capabilities of individuals by making them to be creative, rational in reasoning, reasonable and imaginative in action.

Inweregguh (2015) pointed out that mathematics education can never be separated from everyday living because there is no profession that does not require it for solving one problem or another. James (2005) reported that not only the academicians, scientists, engineers need mathematics, but a shopkeeper, a grocer, a housewife, sportsmen, mechanics, net-work recharge card sellers need mathematics skills to succeed in their enterprise. Mathematics education enhances the thinking capabilities of individuals by making them to be more creative, reasonable, rational as well as imaginative and more useful to the society.

In spite of the importance of mathematics education in National Development, teaching and learning of the subject in schools to inculcate the basic knowledge and practical skills that promotes entrepreneurship has not been adequately encouraged. This might have been as a result of poor mathematics teaching strategies that do not emphasis practical mathematics teaching for day to day life activities and transactions. Other factors include lack of instructional materials, student's interest, and lack of incentives for the teachers, and poor sensitization. Obanya (2011), observed that lack of requisite skills

(entrepreneurial skills) and opportunities contributes largely to unemployment and poor entrepreneurship development in Nigeria. Inweregbuh (2015) stated that teaching and learning of mathematics in schools has failed to enhance creativity and problem solving skills that should make students become innovative in future. This has resulted in schools producing job seekers rather than job creators.

Entrepreneurship involves establishment of small and medium firms to make a living. Suleiman (2006) defined entrepreneurship as the willingness and ability of individual to seek for investment opportunities, establish and run an enterprise successfully. Entrepreneurship development involves gradual growth of entrepreneurial activities to enhance self-sustained business which create room for individual self-reliance in the society. Nwangwu (2006) described entrepreneurs as people who have the ability to seek and evaluate business opportunities, gather necessary resources, take advantage of them and initiate the appropriate action to ensure success. For proper entrepreneurship development in Nigeria, there is serious need for proper mathematics knowledge and practical skills which mathematics education provides.

An entrepreneur requires mathematics knowledge and skills to successfully succeed and accomplish his business undertakings. Entrepreneurial skills are long-term strategies that assist in curbing unemployment. Therefore, the challenge before mathematics educators is how best to deliver their lessons for learners to effectively apply these mathematics knowledge and skills in their daily activities for meaningful entrepreneurship development. This paper seeks to discuss the place of mathematics education in addressing entrepreneurship development in Nigeria.

Meaning of Entrepreneurship

The importance of modern organization lies in the specialization of functions which is encouraged by entrepreneurship. Small and Medium Enterprises (SMEs) is the engine that derive economic growth in every nation. They include soap/detergent producers, Tooth Brush and Tooth Paste making, water treatment and packaging, Food Processing and Bakery. Uveruveh et al (2015) defined entrepreneurship as the willingness and ability of an individual or a firm or organization to identify an environmental change and exploit such an opportunity to produce goods and services for public consumption. Ibe (2013) described entrepreneurship as the process of creating something different with value by devoting the necessary time and effort, assuming the accompanying financial psychological and social risk, and receiving the resulting rewards of monetary and personal satisfaction.

Sadiq (2008) in his view described entrepreneurship as a process involving round activities comprising identifications of enterprises, combination and allocating of resources, planning and controlling business management, mobilization and utilization of local materials, risk bearing, marketing, innovation and the creation of employment opportunities. It is taking up business enterprise quite distinct from obtaining a paid job. Entrepreneurship is the ability of an individual businessman with special qualities and attributes to seek out business opportunity in an environment, establish it and successfully run that business venture. Abakpa and Agho Egwu (2014) defined entrepreneur as someone who is willing to take risk that other people dare not take or as someone who starts and build successful business venture. The term entrepreneur is derived from a French word *entreprenre* meaning “go between”. Entrepreneurial ventures offer innovative products and services to the society. Entrepreneurship spirit and skills which mathematics education provides are pre-requisite for a successful enterprise.

Entrepreneurship Development in Nigeria

Entrepreneurship development can be traced to the middle-ages, when it referred to a person who was in charge of tasks like building and construction projects by applying all the resources at his disposal. The entrepreneurial tasks at that time did not involve any

financial risk but only to do the assigned work until resources are exhausted. In 16th century, entrepreneurship in Nigeria was used as a common term and entrepreneur was in focus as a person who is responsible for undertaking a business venture. During the colonial period, only few Nigerians could boast of personal or family capital to start any meaningful business.

After the Nigeria Independence in 1960, past and present Governments in Nigeria introduced various programmes to create jobs, reduce unemployment and encourage entrepreneurship development in the country. According to Uverueh et al (2015) these programmes include the Operation Feed the Nation (1976), the Nigerian Enterprises promotion decree (1977), the Green Revolution (1979), Operation Back to Land (1983), the Directorate for Foods, Roads Rural Infrastructure, the National Directorate of Employment (1986), the Structural Adjustment Programme (1986), the Family Economic Advancement Programmes (1993), the Peoples Bank, the Community Banks, the Micro Finance Banks, the Seven Point Agenda and Vision 20-2020. All these were aimed at reducing unemployment; create jobs and conducive atmosphere to enhance investment and entrepreneurship development in Nigeria. The effect of these development programmes was that it created opportunities for entrepreneurship development but lacks adequate basic entrepreneurship skills which mathematics education provides.

Mathematics Education and Entrepreneurship Development

Mathematics education is education and training which allows mathematics students to develop and use their creativity and take initiatives, responsibility and risks in business (Nsikak-Abasi and Essien, 2013). Mathematics education provides a solid foundation for everyday life in individual by developing the ability of precision, logical and abstract thinking and ability to be accurate in solving real life problems. The place of mathematics education in entrepreneurship activities is such that most successful entrepreneurs are good at mathematics. Entrepreneurs with average mathematical skills of addition, subtraction, division, and multiplication can manage his entrepreneurial work effectively. They use effectual thinking to form new ideas and imagine new possibilities based on available resources. Effectual thinking is a heuristic reasoning that require imaginative and risk taking which enhances entrepreneurship development. Successful entrepreneurs do not use causal thinking in their decision making.

The creative reasoning skills using geometrical knowledge in mathematics education is very important for entrepreneurship development. Creative reasoning which mathematics education provides implies seeing ideas or objects in a different content either by recognizing their inherent potentials to be used in different way or situation or putting ideas together to create something new. Entrepreneurs with sound knowledge of mathematics education skills manage their entrepreneurial work more successfully than their counterparts who are not proficient in the subject. They do not lack computation ability which Mathematics education offers. Adequate basic foundation in mathematics education is a key to a successful career in any industry. Okpala and Anene (2013) reported that successful entrepreneurs are good in mathematics. Weintraub (2008) stated that many issues in business small or big organization like the ability to compute percentages, decimals, fractions, interpret financial statements, production, salary negotiations, incentive based job performance depends on basic mathematics knowledge.

Mathematics education creates and sustains entrepreneurship tasks in individuals and enhances development using combinatory skills. This aspect of mathematics involves counting and conversion of numbers and units. Numerical skills are important in entrepreneurship development because mathematics is the only language money hears. Entrepreneurial activities depend largely on counting, conversion of numbers and units for a successful enterprise.

The application of mathematics method like regression analysis in entrepreneurial practice in analyzing problems associated with insurance, prediction and optimization of business processes enables entrepreneurs to take reasonable decisions in business.

Mathematics education enhances the thinking ability of individuals through critical thinking by making them to be more creative, rational and imaginative. According to Hornby (2007), Critical thinking has to do with disciplined thinking that is clear, rationale, open minded and informed by evidence. It is needed by entrepreneurs to be successful in business for effective development in the society. The Japanese Auto-technological marketing slogan as pointed by Ede (2008) states that good thinking, good product. Mathematics education encourages critical thinking. Critical thinking brings about rational reasoning which is important in entrepreneurship. This implies that mathematical thinking plays a great role for an entrepreneurship success in business.

Practical work in mathematics education supports entrepreneurship development. Obodo (2004) observed that laboratory approach is a means of putting into practice one or more of the cognitive and psychomotor skills by processing knowledge of construction, measurement, arrangement, observation, classification and interpretation of data. According to Eze (2007), to evaluate teaching is to evaluate the extent the students have been inspired to think and create ideas. The ability of entrepreneurs to accurately calculate and interpret figures allows for better analysis of data, compute probabilities and statistics, target consumers and understand appropriate tax system.

Problem solving skills are achieved by entrepreneurs through mathematics education. Problem solving is critical in understanding and applying the knowledge of mathematics (Abakpa and Agbo-Egwu, 2014). An entrepreneur with adequate knowledge of problem solving strategies stands better chance of success in business. Problem solving encourages the development of creativity skills in individuals and promotes entrepreneurship venture.

The major duty of mathematics educator is to promote taught and inspire inquiry in students. The effective way of doing this is through proper use of instructional materials in teaching (Azurka, 2006). According to Obodo (2004) instructional materials make mathematical concepts real and demystify the mysteries of mathematics to the learner. Entrepreneurs make use of the knowledge of instructional materials learnt in mathematics instructions to create products designs useful to the society.

Mathematics education equips individual with adequate skills for entrepreneurship development. Esangbedo (2014) observed that ability to identify and analyze patterns, logic and critical thinking as well as the ability to see relationship and problem solving skills are some of the important mathematical skills that promote entrepreneurship development.

Factors that Enhance Entrepreneurship Development and Job creation in Nigeria

The entrepreneurship environment in Nigeria is replete with all manner of difficulties in the areas of policy, insecurity, infrastructure, market, capital and weak institutions among others. In spite of all the problems, Nigeria entrepreneurs have remained undeterred and resolute in creating job for themselves and delivering goods and services to the society. Some of the factors that have enhanced entrepreneurship development as pointed out by Usman and Iweka (2013) are as follows:

- **Determination**;- Many entrepreneurs that start business quickly discover that they have no tough mental fortitude to face the challenges in the business. Starting entrepreneurship may be difficult but with resilient determination it can be successfully accomplished. This resilient spirit of determination with high pain tolerance which mathematics education provides through problem solving teaching strategies enhances entrepreneurship venture.

- **Passion:-** Many successful entrepreneurs are usually motivated by intrinsic reasons and not only for money-related reasons. An entrepreneur is always driven by clear sense of purpose because of passion for his business. Aesthetic knowledge and skills which mathematics education provides encourages passion spirit in individuals and promotes entrepreneurship.
- **Vision and Belief-** Entrepreneurs that have visionary spirit and belief always succeed in business. Belief gives entrepreneur the strength and motivation to overcome obstacles in business as they are encountered. The ability to visualize possibilities is essential to entrepreneurial success. This is provided by mathematics education through knowledge of probability which help entrepreneurs to predict the way the economy of their business will behave in future and also calculate market situations in the production of goods and services.
- **Initiative:-** Successful entrepreneurs are ingenious, resourceful and always alert to business opportunities. They put ideas together and are willing to take risks that others fears to take. Abel (2006) stated that putting ideas together create something new. Knowledge of sequence and grouping which mathematics education provides help in putting ideas together and enhance entrepreneurship development.
- **Dream;-** Entrepreneurs take a business opportunity as a future oriented venture in line with his dream. Every successful entrepreneur believes in a dream to be independent in order to achieve his life ambition and mission. This skill is provided by knowledge of variables (dependent and independent variables) which mathematics education provides.
- **Discipline;-** Entrepreneurs have mental toughness that enable them to develop the discipline attitude to success and chances of turning his laudable dreams into reality. Discipline requires strong character because it leads to focus, focus creates clear vision, and clear vision strengthens one's belief and belief results in persistence. Knowledge of problem solving teaching strategies like polya teaching strategy in mathematics education inculcate discipline attitude in individuals and encourage entrepreneurship development.

Unachukwu (2009) in Usman and Iwuka (2013) summarized the activities that enhance entrepreneurship development as follows;

- The ability to create and build something out of nothing.
- The ability to engage in activities despite all odds and in fact surmounting these odds and possible turn them into favour.
- The ability to build a working team to complement talents and efforts.
- The ability of having vision matched with focus and determination of building an enterprise.
- The ability to aggregate, marshal and control resources judiciously.
- The willingness to undertake personal and financial risks.
- The willingness and ability of innovativeness and creativity.
- The skill for seeing opportunity where others fail to do so.

All these activities can be carried out effectively by entrepreneurs through proper knowledge of mathematics education for meaningful entrepreneurship venture.

Conclusion

The quality of knowledge and skills acquired through mathematics education is an important index that determines the quality and stability of entrepreneurship growth in the society. Mathematics education is needed and crucial in all aspect of life. The place of mathematics educators in promoting entrepreneurship development has been discussed and highlighted. Competence in mathematics knowledge and skills is important to entrepreneurship development. An entrepreneur who is exposed to adequate knowledge

and skills in mathematics has better opportunity of becoming a practical and industrious member of the society and can help to reduce unemployment by creating job for others.

Recommendations

The following recommendations should be given attention in addressing the place of mathematics education in Entrepreneurship development in Nigeria.

- Mathematics curriculum should be reviewed to inculcate practical mathematics teaching strategies to enhance entrepreneurship development in Nigeria. This will help school graduates to acquire necessary entrepreneurship skills in schools.
- Mathematics educators should relate their lessons to future achievement of the students using appropriate instructional materials and teaching skills that students can gainfully use in real life in the future to be self reliant.
- Mathematics should be taught by qualified mathematics educators. Employing unqualified teachers that are not specialists in mathematics education should be totally discouraged. This will help to promote proper teaching and meaningful entrepreneurship venture through adequate practical skills and experience.
- Mathematics educators should apply critical thinking level objectives in their teaching to help students achieve entrepreneurial skills that will enable them to become innovative in identifying business opportunities in future life.
- Students should be sensitized by the government and Education institutions on the importance of appropriate mathematics education literacy in addressing entrepreneurship development through adequate enlightenment campaign. This will awaken the interest of the students to take the study of mathematics very serious.
- Mathematics educators should be exposed to modern instructional strategies through workshops, conferences and seminars to help them keep abreast of modern teaching techniques that encourage entrepreneurship.
- Government should provide adequate incentives to the mathematics educators through promotions and allowances to encourage them in their work in order to achieve the entrepreneurship development need of the country.

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