International Journal of Operational Research in Management, Social Sciences & Education
Vol. 2, No. 1 September, 2016
Hard Print: 2536-6521
Online: 2536-653X

The Influence of Secondary School Mathematics on Entrepreneurship Development and Job Creation in Cross River State

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Abstract

This paper focuses on the influence of secondary school mathematics on entrepreneurship development and job creation in Cross River State. A survey research design was used for the study and a random sampling technique was used to collect information from 150 self-employed men and woman for the study. That researcher used questionnaire which consists of the mathematics topic taught in the secondary school to sample the opinions of the businessmen and women in the influence of secondary schools entrepreneurship development and job creation. A valid and reliable instrument was used with the reliability coefficient of 0.73 obtained using split half method. Data collected were analyzed using percentages. The findings include that mathematics education should be taken seriously especially at the secondary school level since it made that business topics like profit and loss, interest, percentages, proportion, ratio, number and numeration should be taught well in secondary schools and more emphasis should be placed on creating an awareness of the option of self-employment, generating interest and desire for people to learn about the entrepreneurial process and develop the skills necessary to start and run businesses of their own successfully.

Keywords: *Influence, Mathematics, Entrepreneurship, Development and Job Creation*

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http://internationalpolicybrief.org/journals/international-scientific-research-consortium-journals/intl-jrnl-of-operational-research-in-mgmt-soc-sci-edu-vol2-no1-sept-2016

Background to the Study

One of the deepest aspirations of any civilized society is the harmonious integration of young people into the mainstream of business and society as a whole. Today, entrepreneurship has become an important issue because of the quest of government to develop economy. No wonder Olagunju (2008) defined entrepreneurship as an undertaking in which one is involved in the task of creating and managing an enterprise for a purpose. This means that the task involved planning, organizing and coordinating activities and resources necessary to manage the enterprise. According to (Wennkers, Thurik & Busi, 1997) "Entrepreneurship is the ability and willingness of individuals, both on their own and within organizations, to: Perceive and create new economic opportunities (new products new production methods, new product-market combinations). Introduce their ideas in the market, in the face of uncertainly and other obstacles, by making decisions on location, form and the use of resources and institutions; compete with others for a share of that market.

Besides being simple and direct, this definition synthesizes the historical aspects of entrepreneurship such as risk, uncertainty, innovation, perception decision-making and change, regarding the contribution of entrepreneurship to economic development in terms of wealth distribution, it does not matter "who" is in fact the entrepreneurial agent, but 'what' kind of activities are being developed and 'how', or to 'what extent', they are perceived as a social gain. Most of this interest results from a general perception that small and medium size companies, under the direction of entrepreneurs, are major contribution of job creation and economics growth. Such a view, shared by economists, politicians and a significant part of society is, in fact, the reason why many countries are trying to promote entrepreneurial activity (Audretsch &Thurik, 2001). Many studies have been developed, or are being carried out, in order to analyze the links between entrepreneurship and growth. So far, evidence show that this relationship is complex (Reynolds, Hay, By grave. Camp & Autio 2001) and the more data are necessary in order to determine the causal mechanisms of this association (Reynolds, By grave Autio, Cox & Hay 2002) however, the evidence available is convincing enough to establish the required development and implementation of public policies that can influence the level of entrepreneurial activity in a country or region.

According to Okeke and Anakpa (2010), when the situation of a particular country is being considered, political status, manufacturing industries, scientific and technological status. As far back as 1975, Ezeilo had noted that there can be no real development scientifically and technologically without the corresponding development in mathematics both as convinced and practiced. In a similar view, Moore (2006) defined mathematics as a logical language for expressing ideas of shapes, quantity, size, order, changes and medical setting. The prosperity of any country depends on the volume and quantity of mathematics offered in its school system (Awodeyi, 2004). The need to acquire knowledge in mathematics in the world over has become very obvious. This is because it is relevant to everyday living and in various disciplines. In fact, nations that do not take great interest and precautions in mathematics remain underdeveloped. It has been well noted that many field of studies and professions need mathematics knowledge for growth and national development. The mechanics, soldiers, doctors, nurses, archeologist, geologist, laboratory technologists, agriculturists, businessmen etc all need mathematics tool to operate their jobs. As a follow up, it has been a compulsory subject for both primary and secondary school levels in Nigeria. Its usefulness in

technological development of the nation as well as to mankind (Imoko, 2004; Uloko and Usman, 2008) further stresses the need for it. This may be the reason for Eraikhumen (2003) to assert that, a sound background in mathematics is a necessary condition for the study of science and science related subjects for scientific and sustainable development.

At different times and in different cultures and countries, mathematics education has attempted to achieve variety objectives. These objectives include:

1. The teaching of basic numeracy skills to all pupils
2. The teaching of practical mathematics (arithmetic, elementary algebra, plane and solid geometry, trigonometry) to most pupils, to equip them to follow a trade or craft
3. The teaching of abstract mathematical concept (such as set and function) at an early age
4. The teaching of selected area of mathematics concept (such Euclidean geometry) as an example of an axiomatic system and a model of deductive reasoning
5. The teaching of selected area of mathematics (such as calculus) as an example of the intellectual achievement of the modern world
6. The teaching of advanced mathematics to those who wish to follow a career in science, Technology, Engineering, and Mathematics (STEM) fields
7. The teaching of heuristics and other problem solving strategies to solve non-routine problems.

Considering the increasing evidence of the effect of entrepreneurship in economic growth (Auretsch &Thurik, 2001) and that economic growth is a powerful force of reducing inequality and poverty (World Bank, 2001) which are direct result of a better distribution of wealth in an economy, it is easy to observe the existing connections between entrepreneurship and economic development. However, in spite of widespread interest in entrepreneurship as the engine of economic growth, the link between mathematics, entrepreneurship, economic development and job creation in the sense of wealth distribution are not much explored. Therefore the study tends to investigate the influence of mathematics education on entrepreneurship development and job creation.

Statement of the Problem

The Nigerian economy is characterized by widespread and deep-seated level of unemployment. This negative socio-economic phenomenon results from poor industrial base, inadequate social infrastructure, under-funding, negligence, and failure of the educational system to produce graduates with requisite skills relevant to social needs. Unemployment is a state of joblessness under which sustainable national development is unattainable.

Consequently, there is overriding need to overhaul the educational system with emphasis on entrepreneurship training/education which provides graduates with necessary skills and attitude that will make them self-employed, self-reliant, employers of labour and productive members of the society. Of course this has not been implemented yet. Moreso, there has been a great concern the world over by mathematics educators about the degree of business mathematical understanding displayed by students in primary and secondary schools. This

situation calls for a progressive analysis of the problems inherent in the teaching and learning of the subject as to improve the success rate. Since there will be no nation without mathematics, there is need to examine the influence of secondary school mathematics on entrepreneurship development and job creation.

Purpose of the Study

The purpose this study is to investigate the influence of secondary school mathematics on entrepreneurship development and job creation. Specifically:

1. To determine the percentage of entrepreneurs who indicated that mathematics topics are imported for entrepreneurship development.
2. To evaluate the percentage of entrepreneurs that needed the knowledge of secondary mathematics for job creation.
3. To look for the ways mathematics should be taught in secondary schools to enhance entrepreneurship development and job creation.

Research Questions

The following research questions guided the study.

1. What percentage of entrepreneurs indicated that secondary school mathematics topics are important for entrepreneurship development?
2. What percentage of entrepreneurs needed the knowledge of secondary school mathematics for job creation?
3. What are the ways mathematics should be taught to enhance entrepreneurship development and job creation?

Significance of the Study

In the area of job creation, entrepreneurship training equips trainees with requisite skills, attitude and knowledge for perceiving business opportunities formation and management of enterprise profitably. Also, entrepreneurship training is effective tool for entrenchment of sustainable national development. Conclusively entrepreneurship training is central to the attainment of economic progress in a market economy characterized by socio-economic deficiencies manifesting in unemployment and under development. The training enables the beneficiaries to be self-reliant, economically empowered and employers of labour.

Literature Review

Economics regard land, labour capital and entrepreneur as the main factors of production the main task of entrepreneur is an individual who creates a new form of business; continue to managed it until it is successful Udoh (2009) says an entrepreneur is the originator, the sole aid ultimate creator of wealth. An entrepreneur is defined as an individual who has the ability to seek, search and find business opportunities in his environment, who has the ability to initiate appropriate action which can ensure business success. Information sourced from the net (www.translators.com2010-2011) on entrepreneur should have qualities of many individuals in himself. Other sterling qualities include, creative innovative, risk taker, capital generator, leader, motivator, adaptive to suggestive, energetic, committed, high perseverance person able to assume responsibility, able to deal with failure, tolerant for ambiguity, good manager self confidence, flexible to changes dynamic, profit oriented, optimist, versatile, knowledgeable in technology, intuitive, achiever, resourceful, goal directed, problem solver.

According to Adeboluyi (2007), entrepreneurship skills are simply business skills which an individual acquire to enable them effectively function in the turbulent business environment as an entrepreneur or self-employed. Entrepreneurship has been defined as a process where individual seek to use their talents, efforts and resources to create an/or grow ventures that capitalize on business opportunities and thereby create value (Williams, 2011). The entrepreneurship process is a series of creative activities that will bring birth and growth in both small and large organizations.

Methodology

A survey research design was used for the study and a random sample technique was adopted to collect information from 150 self-employed men and women which include electricians, mechanics, potters, ice-cream manufacturers, auto and motor cycle parts manufacturers, plastic manufacturers, bakers, printers, typist and business center operators in Boki and Ikom Local Government Area in Cross River State. Data was collected with questionnaire items which consist of the mathematics topics taught in secondary school on the influence of secondary mathematics on entrepreneurship development and job creation. The instrument was validated by two experts in mathematics department from Cross River State College of Education, Akamkpa. Spearman's correlation coefficient was used to establish reliability coefficient of 0.73, using split-half method from 30 entrepreneurs in Boki Cross River State. Data collected were analyzed using percentage and 40% was the bench mark for the decision on the mathematics topics in secondary school which influence entrepreneurship development and job creation.

Results and Interpretation

Research Questions 1

What percentage of entrepreneurs indicated that secondary school mathematics topics are important for entrepreneurship development?

Table 1: Percentage distribution of Mathematics Topic which influence entrepreneurship development

Mathematics Topics Relevant to Entrepreneurship Development	Number of Entrepreneurs	Percentage (%)
Number and numeration	150	100
Mensuration	115	76.6
Plane Geometry	124	82.7
Trigonometry	106	70.7
Probability	108	72
Statistics	137	91.3
Algebraic Processes	112	74.7
Proportion and Ratio	150	100
Profit, loss and Percentages	150	100
Simple and compound interest	150	100
Set and Logic	127	84.7

The table shows the number of entrepreneurs and percentages that indicated the topics in secondary school mathematics influence entrepreneurship development. In table 1, all the entrepreneurs indicated that the topics in secondary mathematics were relevant for entrepreneurship development. Thus 150 (100%) entrepreneurs indicated that number and numeration, profit loss and percentages and simple and compound interest are very important for entrepreneurship development in Anambra State. 115 (76.7%) entrepreneurs indicated that the knowledge of mensuration, 124 (82.7%) entrepreneurs indicated that the knowledge of plane geometry, 106 (70.7%) entrepreneurs indicated that the knowledge of trigonometry, 108 (72%) entrepreneurs indicated that knowledge of probability, 137 (91.3%) entrepreneurs indicated that processes, 127 (74.7%) entrepreneurs indicated that the knowledge of algebraic processes, 127 (84.7%) entrepreneurs indicated that the knowledge of set and logic are relevant to entrepreneurship development of the state for a more improved situation.

Research Question 2
What percentage of entrepreneurs needed the knowledge of secondary school mathematics for job creation?

Table 2: Percentage distribution of Mathematics Topics which influence job creation

Mathematics Topics Relevant to Job Creation	Number of Entrepreneurs	Percentage (%)
Number and numeration	150	100
Mensuration	109	72.7
Plane Geometry	121	80.7
Trigonometry	123	82
Probability	130	86.7
Statistics	118	78.7
Algebraic Processes	121	80.7
Proportion and Ratio	134	89.3
Profit, loss and Percentages	150	150
Simple and compound interest	125	83.3
Set and Logic	113	75.3

The table shows the number of entrepreneurs and percentages that indicated the topics in secondary school mathematics influence job creation. In table two, the result of the research question two indicated that all the entrepreneurs indicated that all the mathematics topics are relevant to job creation in the state. 150 (100%) of the entrepreneurs indicated that number ad numeration, profit, loss and percentages are topics relevant to job creation. 109 (72.7%) entrepreneurs indicated that the knowledge of mensuration, 121 (80.7%) entrepreneurs indicated that the knowledge of plane geometry, 123 (82%) entrepreneurs indicated that the knowledge of trigonometry, 130 (86.7%) entrepreneurs indicated that the knowledge of probability, 118 (78.7%) entrepreneurs indicated that the knowledge of

statistic, 121 (80.7%) entrepreneurs indicated that the knowledge of algebraic processes, 134 (89.3%) entrepreneurs indicated that the knowledge of proportion and ratio, 125 (83.3%) entrepreneurs indicated that the knowledge of simple and compound interest and 131 (75.3%) entrepreneurs indicated that the knowledge of set and logic are relevant to job creation in the state.

Research Question 3

What are the ways mathematics should be taught to enhance entrepreneurship development and job creation?

Table 3: Percentage Distribution of Demographic Information of Responsible

S/N	Items	Number of worker (accepted)	Accepted percentage (%)	Number of workers (rejected)	Rejected percentage (%)
1.	Qualified and competent mathematics teachers should be employed.	150	100	0	0
2.	Mathematics teachers should teach mathematics by using instructional materials.	143	95.3	7	4.7
3.	Writers of mathematics textbooks should prepare textbooks based on the new curriculum.	138	92	12	8
4.	Mathematics teachers should master the subject matter properly by adopting innovative methods that will improved economic development.	150	100	0	0
5.	Mathematics teachers should present mathematics contents using different method of teaching such as: demonstration method, group method, play way method, dramatization method to arouse the students interest.	147	98	3	2
6.	Mathematics teachers should adopt the method of varying teaching skills such as examples, questioning, planned repetition, gesture method and model performance.	136	90.7	14	9.3
7.	Mathematics teachers should focus instruction on the meaningful development of important mathematics ideas	115	76.7	35	23.3

8.	Mathematics teachers should form the idea of giving formative and summative evaluation such as class work, home work assignment, exercise, project, end of the examination, junior secondary school examination, WAEC, GCE to arouse the interest of the students in mathematics.	142	94.7	8	5.3
9.	Business mathematics topics like profit and loss, interest, percentage, proportion, ratio, number and numeration should be taught well in secondary school.	142	94.7	8	5.3
10.	Mathematics teachers should allow students to evaluate each others ideas and reasoning during mathematics lesson in ways that are not critical	132	88	18	12

The results from table 3 showed that 100% of the entrepreneurs suggested that qualified and competent mathematics teachers should be employed and mathematics teachers should master the subject matter properly by adopting innovative methods that will improved economic development 95.3% of the entrepreneurs suggested that mathematics teachers should teach mathematics by using concrete materials, demonstration method, group method, dramatization to arouse the students' interest, 92% of the entrepreneurs suggested that writers of mathematics textbooks should prepare adequate textbooks based on the new curriculum. 98% of the entrepreneurs suggested that mathematics teachers should present mathematics contents to the students as a discipline that is important to life. 90.7% of the entrepreneurs suggested that mathematics teachers should adopt the method of varying teaching skills such as use examples, questioning, planned repetition, gesture method and also model performance. 94.7% mathematics teachers should form the idea of giving formative and summative evaluation such as class work, homework assignment, exercises, project, end of the term examination, junior secondary school examination, WAEC, NECO, GCE to arouse the interest of the students in mathematics. Finally 94.7% of the entrepreneurs responded that business mathematics topics like profit and loss, interest, percentages, proportion, ratio, number and numeration should be taught well in secondary schools. The percentage of the entrepreneurs that rejected the option were stated accordingly.

Conclusion

It is a common knowledge that the system of education bequeathed to Nigeria by her colonial master is devoid of technical skill acquisition and self-reliance which could result in sustainable development. Undue emphasis was placed on clerical/administrative facet of

education. This distorted educational system continued in the wake of the country's independence resulting in the existence of army of graduates who are largely job seekers, who depend absolutely on white-collar jobs available in government establishments. Unemployment is a state of joblessness under which sustainable national development is unattainable.

However, economic realities contracted employment opportunities in the society. As a result, government and authorities in the educational sector have turned attention to self-employment generating platform with inherent feature of creating jobs and entrepreneurship is a central phenomenon in this regard. This paper argues that entrepreneurship results in job creation and sustainable national development entrepreneurship.

Consequently there is overriding need to overhaul the educational system with emphasis on entrepreneurship training/education which provides graduates with necessary skills ad attitude that will make them self-employed, self-reliant, employers of labour and productive members of the society.

Entrepreneurship training side by with mathematics fuels the drive for increasingly efficient use of resources/human and materials and serves as key to accelerating the generation, dissemination and application of innovative and creative ideas, which culminates in job creation, economic empowerment and foster sustainable national development. Conclusively entrepreneurship training with mathematics topics is a veritable mechanism for job creation and impetus to attainment of sustainable national development in Nigerian economy replete with socio-economic imperfections.

Recommendations

1. Qualified mathematics teachers should be employed and they should master the subject matter properly by adopting innovative methods that will improve economic development.
2. Business mathematics topics like profit and loss, simple and compound interest, percentages, proportion, rate probability, number and numeration should be taught well in secondary schools.
3. There is urgent need to reduce abstract concepts in mathematics to concrete forms in order to ensure that learners assimilate with ease what they are expected to learn in a given lesson or set of instructions. Therefore it is recommended that mathematics teachers should teach the subject by using instructional materials.
4. The security situation of the country needs to be improved to make business do able in the country.
5. Mathematics teachers should present mathematics contents using different methods of teaching such as demonstration method, group method, play way method, dramatization method to rouse the students interest.
6. Provide the children with the necessary skills in numeracy and expose them to ways of applying these skills to their problem.
7. Occasionally take the students out to see mathematics in action that is going on excursion to banks, markets, post office etc.

8. Introduce the child to the basics of record keeping and all aspects of accounting.
9. All administrative bottlenecks which made funds in accessible to entrepreneurs should be mitigated.
10. The entrepreneur education in Nigeria should refocus the teaching and training of students inculcating entrepreneurial skills that can help them to be creative, innovation, develop feasible business plan and setup new business ventures.

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