An Investigation into the Impact of Application of Mathematics in Entrepreneurial Skills Development

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Abstract- *This study focused on the impact of the application of mathematics in entrepreneurial skill development The study was conducted in in Idemili North Local government Area Anambra State. Mostly people in Idemili North Local Government Area are known for their engagement with small and large skilled business for earning a living. A survey research design was used for the study. The Taro Yamane formula was used to select a sample of four hundred (400) entrepreneur from major commercial towns in the Local Government Area. The instrument of study was Ten (10) items structured questionnaire. The instrument was validated by two lecturers from mathematics department and measurement and evaluation unit of psychology department of Nwafor Orizu College of Education, Nsugbe. The reliability was established using Pearson Product Moment Correlation Coefficient(r) and a value of 0.85was obtained which was considered high enough. Three (3) research questions and two (2) research hypotheses were formulated to guide the study. The research questions were analyzed using percentages (%) and the research hypothesis was tested using Chi-square(X2) statistic at 0.05 level of significance. In light of the findings, recommendations were made that application of mathematics in entrepreneurial development studies essential for rapid and sustainable economic growth and development; reduction in unemployment and poverty.*

I. INTRODUCTION

An entrepreneur is a person with foresight, far sight; mind sight and insight into business ventures (Igbongidi, 2010). Entrepreneur is person who discovers new method and new market of production. This means that an entrepreneur takes calculated risks, enjoys business challenges and sees these challenges as stepping stones toward success.

Entrepreneur refers to as people that have willingness to take risks while others stand to talk, identify opportunities to which others are blind and develop optimum confidence in themselves well beyond that of others. It is also described with the following attributes: go-getter, business superstar, dreamer, visionary, innovation, inventor, creator, translator, achiever, Seer risks taken identifier, building promoter, initiator, and mentor (Igbonigidi, 2010).

Entrepreneurs are frequently thought of as national assets to be cultivated, motivated and remunerated to the grated possible content. They also change the way we live and work. If successful their innovations may improve our standard of living. In short, in addition to creating wealth from their entrepreneurial ventures, they create jobs and better the conditions for a prosperous society. Furthermore, entrepreneurs create Social Changes through their unique offerings of new goods and services by break away from tradition, indirectly supporting freedom and reducing dependence on obsolete systems and technologies. They also help in Community Development by investing in community projects and provide financial support to local communities. They Add to National Income through their ventures which literally generate new wealth. The act of being an entrepreneur is known as entrepreneurship. No one can succeed in entrepreneurship through sheer luck except through creative ideas, extensive research work, plenty of trials doggedness, innovative ideas, precise decision making, accurate problem

solving, good managerial ideas and consistent persistence and consistent persistence efforts. All these which can build entrepreneurship activities successful can be provided through the knowledge of Mathematics. (Odumosu & Olusesan, 2016)

Mathematics is a serving subject to all field of endeavor. The importance of this servicing subject to individuals, artisans, traders, school subjects, economic activities, political development, business advancement, technological knowhow and so on cannot be over- emphasized.

Mathematics Application on Entrepreneurial Development skills

1. HAIR DRESSING: It is a salon where you can make hair or cut hair to look more attractive. The area of Mathematics applied are: proportion, geometry, construction
2. BEAD DRESSING: It is art of forming or attaching beads to one another by stringing them with a sewing needle or beading needle and thread or thin wire for cloths, jewelry, shoes, bags, etc The areas of Mathematics applied are: Probability, Proportion, and Geometry.
3. DECORATION: It sis the art of making something or place to look more attractive on special occasion like house, church, funeral seasonal decoration etc. The areas of Mathematics applied are: Geometry, Statistics, Linear equation, Simple proportion.
4. ARTS: It is a person engaged in one or more of any of as broad spectrum of activities related to creating art, practicing the arts and demonstrating on art. The areas of Mathematics applied are: Geometry, Trigonometry.
5. ANIMAL HUSBANDRY: It is the management and care of farms animals by humans in which genetic qualities and behaviour considered to be advantageous to humans and further developed. The area of Mathematics applied are:: Statistic, Ratio, Percentage.
6. VULCANIZE: Is a process of Harding rubber by treating it with sulphur at a high temperature.

The area of Mathematics applied are:: Dynamics. Statistics.

7. CARPENTERS: Is a person who makes wooden objects and structures. The areas of Mathematics applied are: Geometry, Statistics.
8. CATERING: Is the process of preparing, preserving, and providing of foods and drinks for meeting or ceremonies or social events. The areas of Mathematics applied are: Statistics, Measurement, and Proportion.
9. HOUSEHOLD: Is anything being produce for the use or consumption of the family members. The area of Mathematics applied are:: Statistics, Geometry, Trigonometry.
10. DRIVING: Is the process of operating and controlling the direction and speed of a motor vehicle. The areas of Mathematics applied are: Dynamics. Proportion; Rate.
11. ICT/SYSTEM REPAIR: Is the process of restoring a good condition of a system, or ICT or GSM. The areas of Mathematics applied are: Integration, Calculus, and Dynamics.
12. EVENT PLANNING: Is the process of managing a project such as meeting, convention, trade show, ceremony, team building activity, party. The area of Mathematics applied are:: Statistics, Simple Arithmetic, Probability.
13. WEB DESIGNER: It is planning, creating, updating of websites. The areas of Mathematics applied are: Proportion, Ratio
14. DIGITAL PRINTING:Is the process of transferring a document on a personal computer or other digital storage device to a printing substrate by means of a device that accepts text and graphic output. The area of Mathematics applied are:: Geometry, Algebra Formulas, Angles, Fractions, Circle Areas, Percentage.
15. PHOTOGRAPH: It is the science of creating durable images by recording light or other electromagnetic radiation, either electronically by means of an image sensor or chemically by means of light sensitive materials such as photographic firm. The areas of Mathematics applied are: Geometry, Fraction, Angles, and Percentage.
16. INTERNET: Is an international information network that is linking computers.

The areas of Mathematics applied are: Geometry, Calculus, and Dynamics.

17. Local area network (LAN): Is a computer network that links devices within building or group of adjacent buildings.

The areas of Mathematics applied are: Geometry, Probability, Proportion, Trigonometry, and Dynamics.

18. SOAP MAKING: Is the process producing soap for personal and commercial use.

The area of Mathematics applied are:: Statistics and Dynamics, Geometry.

19. PERFUME: It is a sweet –smell liquid for applying in the today. The area of Mathematics applied are:: Statistics and Dynamics.

20. Air FRESHER: is a product designed to mask or remove unpleasant odor in the rest rooms.The area of Mathematics applied are:: Static, Dynamic, Geometry. Source: Shelby L. Brumelle (1939 – 2001) and Sonoike (2006)

Statement of Problem

Unemployment is an issue which is geometrically increasing globally. Entrepreneur skills development has recently become the solution to the agitation towards the reduction of unemployment in Nigeria. The Entrepreneur skills development requires the knowledge of mathematics. This study sought to investigate the impact of application of mathematics in entrepreneurial development skills.

Purpose of study

Specifically the study sought to find out:

1. Whether the application of Mathematics contribute to the development of an entrepreneurial skill.

2. The extent to which the level of mathematics knowledge acquired by male have influence on their success in entrepreneurial skills development.

3. the extent to which the level of mathematics knowledge acquired by female have influence on their success in entrepreneurial skill development.

Research Questions

The following research questions were raised to guide the study

1. To what extent does the application of mathematics contribute to the development of entrepreneurial skills?

2. To what extent do the level of mathematics knowledge acquired by male have influence on their success in entrepreneurial skills development?.

3. The level of mathematics knowledge acquired by male and female does not have influence on their success in entrepreneurial skills development?

Research Hypothesis

The following null hypothesis guided the study

H_O : There is no significant differences between the influence of the level of mathematics knowledge acquired by male on their success in entrepreneurial skills development and the influence of the level of mathematics knowledge acquired by female on their success in entrepreneurial skills development

Research method

Survey Research Design was adopted for the study. The population of the study comprises of all entrepreneurs based in Idemmili North Local Government Area. A sample size of four hundred (400) entrepreneurs was selected using Taro Yamane formula for determining sample size from the major commercial towns in the Local Government Area. A Ten (10)- item structured questionnaire was formulated to guide the study. The instrument was validated by two lecturers from mathematics department and measurement and evaluation unit of psychology department of Nwafor Orizu College of Education, Nsugbe. The reliability was established using Pearson Product Moment Correlation Coefficient and a value of 0.85was obtained which was considered high enough. Three (3) research questions and one research hypothesis were formulated to guide the study. The research questions were analyzed using mean and the research hypotheses was tested using Chi –square (X^2) at 0.05 level of significance.

Results

Research Question 1: To what extent does the application of mathematics contribute to the development of an entrepreneurial skills.

Table 1: Mean response on the application of mathematics contribution to the development of an entrepreneur skills

S/N O.	Items	Agreed	Disagree
1.	Development of entrepreneurial skills need knowledge of Mathematics	250(62.5%)	150(37.5%)
2.	Good Mathematics students do well in entrepreneurial skills acquisition.	300(75%)	100(25%)
3.	Without the knowledge of MathematicsI cannot do well in entrepreneurial skills acquisition	280(70%)	120(30%)
4.	Entrepreneurial skills can be developed without the application of Mathematics.	100(25%)	300(75%)
5.	Mathematics knowledge when applied in my entrepreneur skills will not help to maximize profit	100(25%)	300(75%)

Table1 shows 62.5% of the respondents agreed that the development of entrepreneurial skills need knowledge of Mathematics. Interestingly 75% agreed that good Mathematics students do well in entrepreneurial skills acquisition,70% agreed that without the knowledge of Mathematics entrepreneurs cannot do well in entrepreneurial skills development,75% agreed that entrepreneurial skills cannot be developed without the application of Mathematics .Also 75% disagree that Mathematics knowledge when applied in entrepreneur skills will not help to maximize profit. Research Question 2: To what extent does the level of mathematics knowledge acquired by male have influence on their success in entrepreneurial skills development?

Table 2: Male mean ratings on the level of acquisition of mathematics knowledge influence on their success in entrepreneurial skill development

S/N	Items	Agree	Disagree
1	Mathematics can be applied at all level of any entrepreneurial skills development.	100(50%)	100(50%)
2	the level of the application of mathematics knowledge influences entrepreneurial skill acquisition	150(75%)	50(25%)
3	Teaching of entrepreneurial skills need adequate basic knowledge of mathematics	130(65%)	70 (35%)
4	Knowledge of Mathematics helps entrepreneur ,towards increasing their daily income.	40(20%)	160(80%)
5	The knowledge of Mathematics iimproves the managerial skills of the entrepreneur in their everyday life.	75(37.5%)	125(62.5%)

Table 2 shows that 50%of male respondents agreed and disagreed that Mathematics can be applied at all level of any entrepreneurial skills development. 75% of male respondent agreed that the level of the application of mathematics knowledge influences entrepreneurial skill acquisition. 65% of the male entrepreneurial skill instructors agreed that teaching of entrepreneurial skills need adequate basic knowledge of mathematics. 80% of male

respondent disagreed that the knowledge of Mathematics helps entrepreneur, towards increasing their daily income.62.5% of male respondent agreed that the knowledge of Mathematics improves the managerial skills of the entrepreneur in their everyday life.

Research Question 3: To what extent do the level of mathematics knowledge acquired by female have influence on their success in entrepreneurial skill development ?.

Table 3: Female mean ratings on the level of acquisition of mathematics knowledge influence on their success in entrepreneurial skill development.

S/N	Items	Agree	Disagree
1	Mathematics can be applied at all level of any entrepreneurial skills development.	150(75%)	50(25%)
2	the level of the application of mathematics knowledge influences entrepreneurial skill acquisition	150(75%)	50(25%)
3	Teaching of entrepreneurial skills need adequate basic knowledge of mathematics	150(75%)	50 (25%)
4	Knowledge of Mathematics helps entrepreneur, towards increasing their daily income.	60(30%)	140(70%)
5	The knowledge of Mathematics iimproves the managerial skills of the entrepreneur in their everyday life.	25(12.5%)	175(87.5%)

Table 3 shows that 75% of female respondents agreed that Mathematics can be applied at all level of any entrepreneurial skills development.75% of female respondent agreed that the level of the application of mathematics knowledge influences entrepreneurial skill acquisition. 75% of the female entrepreneurial skill instructors agreed that teaching of entrepreneurial skills need adequate basic knowledge of mathematics. 70% of female

respondent disagreed that the Knowledge of Mathematics helps entrepreneur, towards increasing their daily income.87.5% of female respondent disagreed that the knowledge of Mathematics improves the managerial skills of the entrepreneur in their everyday life.

Research Hypotheses
Table 4
Ho: There is no significant difference between the influence of the level of mathematics knowledge acquired by male on their success in entrepreneurial skills development and the influence of the level of mathematics knowledge acquired by female on their success in entrepreneurial skills development

Ratings / Respondents	Agree			Disagree			
	O	E	$\frac{O-E/^2}{E}$	O	E	$\frac{O-E/}{E}$	Total
Male	50	52	0.077	51	49.5	0.045	101
Female	52	50.5	0.045	47	48.5	0.046	99
Total	102			98			200

Computation of X^2

$x2 = \sum \frac{O-E/^2}{E} = 0.0770.045 + 0.045 + 0.046 = 0.213$

$C = \sqrt{\frac{X^2}{N + X^2}} = \sqrt{\frac{0.213}{200 + 0\ 213}}$

X^2table(1,0.05)=3.841 X^2 calculated = 0.213

Decision : Since the X^2 calculated = 0.213 is less than X^2table(1,0.05)=3.841 we accept H_O: There is no significant differences between the influence of the level of mathematics knowledge acquired by male on their success in entrepreneurial skills development and the influence of the level of mathematics knowledge acquired by female on their success in entrepreneurial skills development

Discussions:
The result as shown in table 1 indicates that the application of mathematics contributes to the development of an entrepreneurial skill. This implies that basic knowledge of mathematics

is a pre=requisite for entrepreneurial skill development.

The result as shown in table 2 and 3indicates that there is gender effect on the level of acquisition of mathematics knowledge influence on success in entrepreneurial skill development.

The result as shown in table 4 reveals that the X^2 calculated = 0.213 is less than X^2table (1, 0.05)=3.841,hence H_O is accepted that there is no significant differences between the influence of the level of mathematics knowledge acquired by male on their success in entrepreneurial skills development and the influence of the level of mathematics knowledge acquired by female on their success in entrepreneurial skills development. This implies that gender do not have effect on the influence of the level of mathematics knowledge acquired and the success achieved in entrepreneurial skills .The contingency coefficient C computed to text the extent of the relationship give 0.033 which indicates low relationship between male and female respondent.

In the views of Odumosu & Olusesan,2016, "All these which can build an entrepreneurship activities successful can be provided through the knowledge of Mathematics", the study revealed that application of mathematics in entrepreneurial skill development is essential for rapid and sustainable economic growth and development; reduction in unemployment and poverty. It also reveals the concepts of Mathematics that is applied during the development of entrepreneurial skills .The level of basic mathematics knowledge acquired by an entrepreneur determines his /her incomes and earnings or the profit maximization function

Recommendations
1. Government should make sure that every citizen attains basic education which will give them access to basic Mathematics knowledge.
2. Government agencies at the state and local government levels should locate special basic schools at strategic places in the communities for those adults who are disadvantaged from attending the formal school in time and space.
3. Government should make available standard curriculum for entrepreneurial skill development. This should have basic Mathematics as a major course.

REFERENCES

[1] Aboit, Lewis Fredrick, (2003). Industry and Enterprise. An International Survey of Modernization and Development.

[2] Abott Lewis F. (2003): Concept of Development. Operational Needs Assessment Concept of Operation, Operational requirements and High – Level Conceptual Definition Importance of Development.

[3] Igbongidi (2010): Meaning of Entrepreneur, Enjoy Business Challenges and sees these Challenges as Stepping Stories Towards Success.

[4] Igbongidi, B.P (2010). Entrepreneurship: A Strategic Tool for Sustainable Development. A Paper Presented at the 22nd ABEN National Conference at Federal College of Education, Abeokuta.

[5] Nworgu, B,G (2006): Educational Research Issue and Methodology Ibadan Oluseji Press.

[6] Odumosu M.O and Olusesan E.G(2016) Relevance Of Mathematics Education To Entrepreneurship Skills Acquisition Towards The Realization of Vision 20:2020.International Journal For Cross – Disciplinary Subjects In Education .7(2).2768-2773

[7] Shelby L. B (1939 – 2001) Math Skills and Entrepreneurial Success Theories of the Application of Mathematics in Entrepreneurial Development Student.

[8] Sonoike O. (2006). Concept of Entrepreneur. Youth should be Creating Innovative, Self Reliant and be Prepared.