

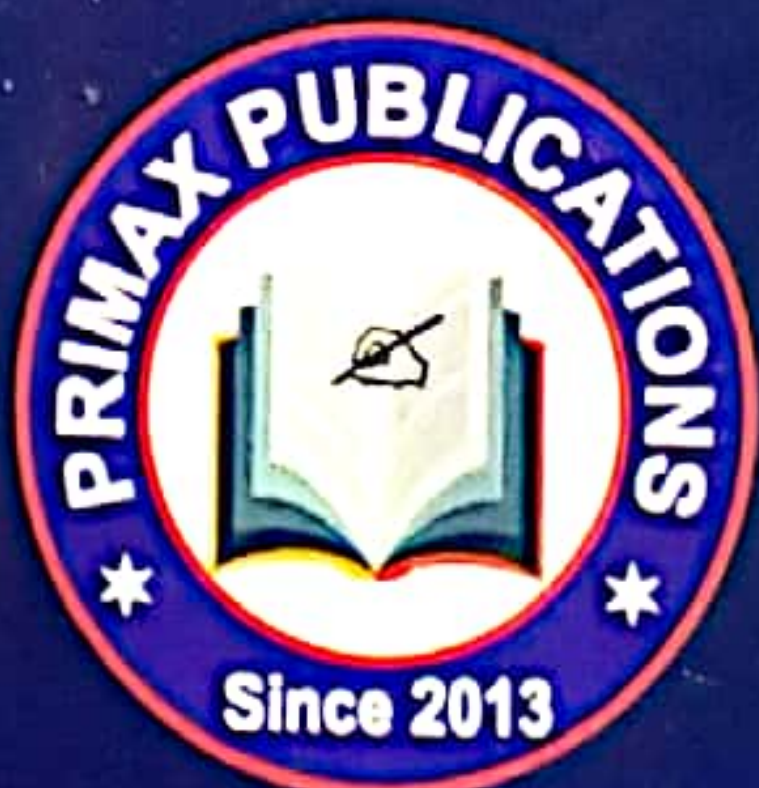
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ENTREPRENEURSHIP, TECHNOLOGY AND INNOVATION - FROM A GLOBAL PERSPECTIVE



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CONTENT

Sl.No.	Title	Page No.
1.	Interpretation on Investment Pattern of Women Investors Dr. G. K. Lavanya <i>Assistant Professor, PG & Research Department of Commerce Shri Shankarlal Sundarbai Shasun Jain College for Women, Chennai, India</i>	1 - 13
2.	Importance of Mathematics in Developing Entrepreneurship Skills Roshini Anne Koshy <i>Assistant Professor, Department of Science, St Francis de Sales College Bengaluru, Karnataka, India</i> Rashmi. N <i>Assistant Professor, Department of Science, St Francis de Sales College Bengaluru, Karnataka, India</i>	14 - 20
3.	Decision Support Expert System in Supply Chain Management Pallikkara Viswanathan <i>Faculty Member of Indian Institute of Materials Management Bengaluru, Karnataka, India</i>	21 - 25
4.	Rashtriya Gokul Mission Ganesh S. Shinde <i>Assistant Professor, Dr. D. Y. Patil Vidyapeeth, Centre for Online Learning Sant, Tukaram Nagar, Pimpri, Pune, Maharashtra, India</i>	26 - 27
5.	The Role of Digital Currency in Financial Inclusion in India Parmod <i>Research Scholar, Dept. of Computer Science & Engineering Chaudhary Devi Lal University, Sirsa, Haryana, India</i>	28-34

IMPORTANCE OF MATHEMATICS IN DEVELOPING ENTREPRENEURSHIP SKILLS

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Abstract

Today entrepreneurial activities are mostly based on online and e-business transactions rather than the use of balance sheets, for this one should have a strong mathematical skill. There is no business without Mathematics, an entrepreneur must know basic mathematical operations such as addition, subtraction, multiplication, division, use of percentage and fractions. These operations help you perform accurate calculations with your customers, vendors, and investors. Knowledge of basic mathematical operations also makes you confident of the financial decisions you make. In this fast-developing world knowledge of mathematical applications has become very essential for an entrepreneur. Entrepreneurs who are good at math often perform better than their counterparts who are not proficient in the subject. Being strong in math will help to understand the investment system better and evaluate target consumers and understand taxes. Mathematics will help the entrepreneur to understand his or her strategies in marketing and will make them improve better. To develop a good business plan, it is very important for young entrepreneurs to know the math behind their business.

The purpose of this paper is to discuss the importance of mathematics in strengthening entrepreneurship skills.

Key Words: *Entrepreneur, Mathematical Operations, Financial Decisions, Investment System, Strategies and Business plan.*

1. Introduction

The term Entrepreneur has acquired incredible importance and popularity in the current competent world. The main aim of this paper is to understand the importance of Mathematics in developing entrepreneurship skills. Mathematics is an essential discipline that is recognized as a tool for daily activities in one or the other way. To become successful entrepreneur, one should have certain characteristics like ability to face any challenges and risks, should be creative and innovative, must have good leadership quality, should be open to any changes and flexible, should be very clear with the startup idea and have good knowledge of the latest trends in the market, should be ready to support research and development which leads to development of the economy. The main aim of study in this paper is to understand the relevance of mathematics education in development of entrepreneurship skills.

The discussion is presented based on survey conducted among students and faculty members of various colleges. As there is no life without Mathematics and Mathematics is an integral part of achieving good job opportunities and developing one's career, the study in this paper mainly focuses on, if mathematics could improve computational skills, critical thinking, problem solving skills, analytical reasoning, decision making and managerial skills of an entrepreneur and if one can become successful entrepreneur with good knowledge of Mathematics.

2. Who is an Entrepreneur?

We already know that an entrepreneur is someone who starts a business and is willing to risk loss in order to make money. It is also the case that when we hear the term entrepreneur, we are disposed to relate it with a person who has or is starting their own enterprises. An entrepreneur is someone who is having a vision to exploit a socio-political and economic landscape of opportunities with an unrevealed amount of risks. The entrepreneurs are often known as a source of new ideas and innovators and bring new ideas in the market by replacing old with an invention. Concisely, someone who is bold minded and can stick to activeness to start a new business and bears all the risks that go with it can become an entrepreneur. According to Horovitz (1997), a true entrepreneur is someone who knows the right people, can form effective teams, move quickly, and deliver on plans. Basically, entrepreneurs are the pioneer of bringing new technologies and systems that ultimately bring changes to society. These changes are associated with improved lifestyle, generous thinking, better morale, and higher economic choice. In this way, social changes gradually impact national and global changes [7]. Understanding basic mathematical concepts is essential when undertaking an entrepreneurial venture. Entrepreneurs with good knowledge of mathematics perform better than their counterparts who are not skillful in mathematics. One major component of the entrepreneurial strategies is financial strategy. To develop a good business, entrepreneurs need to know the mathematics behind their business.

3. What is Entrepreneurship?

Entrepreneurship is the act of developing, organizing, and running a novel business to generate profit while taking on financial risk. Entrepreneurship has always been with human beings in all aspects of life. It has been the base of human community's development. However, in the process of its evolution, it has been defined in different ways. Entrepreneurs may be defined as "the procedure of innovation and using opportunities with a lot of effort and perseverance

together with accepting financial, psychological and social risks". It is indeed motivated by earning promotion, self-satisfaction, and independence [9]. Entrepreneurs are those people who are capable and have the ability and desire to establish and succeed in a new startup venture along with the risk associated with it to gain the desired profit. To become successful entrepreneur, one should have certain characteristics like ability to face any challenges and risks, should be creative and innovative, must have good leadership quality, should be open to any changes and flexible, should be very clear with the startup idea and have good knowledge of the latest trends in the market, should be ready to support research and development which leads to development of the economy.

4. What are Entrepreneurship skills?

Entrepreneurial skills are those normally associated with being an entrepreneur, although anyone can develop them. Being an entrepreneur usually means starting and building your own successful business, but people with entrepreneurial skills can thrive within large organizations, too [11]. According to Do Paco et al. (2011a:2011b) entrepreneurship education can develop skills for entrepreneurship success, and that entrepreneurs will need it in the future. Some entrepreneurs prefer to rely on themselves believing that they have the skill need it to be successful, but once they discover training programs new horizons emerged to their business success and they find teachable skills [12].

Skills required to be an entrepreneur

- 1) Courage
- 2) Clear and concise vision
- 3) Focus and discipline
- 4) Leadership skills
- 5) Financial skills
- 6) Mathematical skills
- 7) Time management
- 8) Communication skills
- 9) Marketing skills

Courage is one of the most important things an entrepreneur possesses because anyone can buy his or her intelligence with money, but no money can buy his or her courage. Entrepreneurship is a rollercoaster ride, with so many ups and downs, an entrepreneur requires courage to continue with his business. If an entrepreneur has no vision, he or she is blind, if they are blind, they don't know where they are going and cannot acknowledge the process. So, vision is very much essential in any business. As a business owner, you need to stay focused and objectively assess your position in the market and visualize the future growth and direction of your business. Today, we no longer live in the age of information overload. Staying disciplined is no doubt a critical factor to the success of a business, and yourself as an entrepreneur. Everything can be organized efficiently if you are determined to adopt discipline in your business [10]. As a leader, entrepreneurs have to work well with their team members and understand how to motivate, help others to reach their goals, discipline them and provide support. As John C. Maxwell once said, "A leader is one who knows the way, goes the way, and shows the way". The most stressful hurdle to cross after conceiving a business idea is that of raising capital. Trying to convince people that you are trustworthy is a difficult task especially when you are a beginner [3]. Therefore, entrepreneurs have to be financially skilled at managing finances. Financial skills can be improved by working under a financial advisor or by reading books etc. Everyone needs math and uses in their life and an Entrepreneur who is mathematically skilled can maintain the business very well. Someone who is skilled at managing time can be a successful entrepreneur. Entrepreneurs can learn to manage the time by using tools like calendars, task breakdown, prioritizing or completing the urgent tasks etc. Entrepreneurs need to understand the preferences of their target. Based on the target enterprise should be made and he or she should be skilled at marketing their products to become successful. Knowing about the product is not a big thing but entrepreneurs must know how to

present the product. Entrepreneur who is skilled at communication and marketing can make the interaction effectively with the people, they can clearly communicate with the business investors and employees,

One of the most important skills required to be an entrepreneur is mathematical skills. Mathematical skills help the entrepreneurs in many ways like making charts and graphs, interpreting profit and loss, maintaining the budget, financing, tax related things and analyzing the business performance. Therefore, someone who is mathematically skillful can run the business very well. Mathematics has indeed been a beacon of light to all the sciences and entrepreneurship acquisitions and mathematics is indispensable to all knowledge, and all entrepreneurship education, which does not include mathematics, may be defective in its foundation [5].

5. Research Methodology

The study is based primarily on survey research. The data was collected by means of a questionnaire prepared through google form, the questionnaire was circulated among faculty members and students of various colleges. The questionnaire consisted of ten questions which mainly focused on the role of mathematical skills in developing entrepreneurship skills and with mathematical knowledge if one could become a successful entrepreneur. The questions consisted of options like, yes, no, true, false, agree, disagree, maybe and neutral.

The explanation of the study in this paper is mainly descriptive which is based on both primary and secondary data collected [5] and the author's views are incorporated with it and presented in the paper.

6. Results

Table 1. Responses of Importance of Mathematics in developing Entrepreneurship skills

Table - 1

Designation	Questionnaire answered		
Faculty	19 people		
Student	53 people		
Other	8 people		
Is the knowledge of mathematics is important for Entrepreneur in their daily life	Yes	No	Maybe
Faculty	94.74%	Nil	5.26%
Student	92.45%	Nil	7.55%
Other	100%	Nil	Nil
Do mathematical knowledge help in developing logical and sensible mind	Yes	No	Maybe
Faculty	94.74%	5.26%	Nil
Student	92.45%	Nil	7.55%
Other	100%	Nil	Nil
Can entrepreneur be successful without basic mathematical skills	Yes	No	Maybe
Faculty	5.26%	73.68%	21.05%
Student	5.66%	79.24%	15.1%
Other	Nil	50%	50%
Will knowledge of basic math operations help in developing entrepreneurship activities	True	False	Maybe
Faculty	94.73%	Nil	5.26%
Student	88.68%	Nil	11.32%
Other	87.5%	Nil	12.5%
Can future trends of business be computed with the mathematical knowledge	Agree	Disagree	Neutral
Faculty	73.68%	10.5%	15.79%
Student	86.79%	1.89%	11.32%
Other	100%	Nil	Nil
Is mathematical knowledge essential for an entrepreneur to enhance managerial skills	True	False	Maybe
Faculty	100%	Nil	Nil
Student	86.79%	Nil	9.43%
Other	75%	Nil	25%

Does mathematical skills enhance creativity in an entrepreneur	Yes	No	Maybe
Faculty	73.68%	5.26%	21.05%
Student	66.04%	7.55%	26.41%
Other	75%	12.5%	12.5%
Lack of knowledge in calculations has negative impact on entrepreneurship activities	Agree	Disagree	Neutral
Faculty	73.68%	Nil	26.31%
Student	73.58%	15.09%	11.32%
Other	50%	12.5%	12.5%
Mathematics education helps students not only in calculations but also other areas of life especially in developing entrepreneurship skills	Yes	No	Maybe
Faculty	57.9%	21.05%	21.05%
Student	96.23%	Nil	3.77%
Other	87.5%	12.5%	Nil
Good knowledge of mathematics helps entrepreneur to perform better than the counterparts, who are weak in mathematics	Yes	No	Maybe
Faculty	78.94%	Nil	21.05%
Student	71.7%	7.54%	20.75%
Other	62.5%	Nil	37.5

7. Discussion of Results

The results show that most of the faculties and students agree that some important skills such as computational skill, problem solving skill, analytical skills and creativity skills acquired through mathematics education are key ingredients for success in entrepreneurship activities. From the table and graphs it can be seen that there is no much difference of opinion towards the importance of mathematical skills in developing entrepreneurship skills. It becomes crucial to accurately calculate and interpret figures, analyze data, compute probabilities and statistics, understand investment systems, evaluate target consumers and understand taxes in today's entrepreneur's world. Mathematics can

encourage self-reliance and enable individuals to learn to solve his personal problems which helps in solving problems on entrepreneurship activities thereby enhancing entrepreneurship skills. Therefore, from the results it shows that Mathematical skills are the backbone of entrepreneurship activities without which it may not be that successful. As entrepreneurship plays an important role in economic activities, mathematical skills will help entrepreneurs to make right decisions that would benefit self and the society [5]. Mathematics education is an integral part of entrepreneurship which no entrepreneur can neglect [6]. Mathematics education is therefore indispensable in nation building [8].

8. Recommendations

- 1) Entrepreneurship education should be included in Mathematics education for students.
- 2) Mathematical skills required to be an entrepreneur should be given more importance in entrepreneurship education.
- 3) Mathematics students should often have activities with industries so that they can come with their own enterprise.
- 4) Training should be given for teachers at all levels of education on the importance of mathematics education in enhancing entrepreneur skills among all the students.
- 5) Mathematics education to be incorporated in such a way that students can develop both mathematical and entrepreneurial competencies.

9. Conclusion

Entrepreneurship matters a lot because its goal is to create a better tomorrow. The world would be a dull space without entrepreneurs because entrepreneurship increases self-employment, economic growth, spirit of creativity and risk taking which can benefit both individuals and businesses. Mathematics and mathematical skills play an important role in entrepreneurship activities and mathematical knowledge is the base for entrepreneurship education. Therefore, Mathematics is the major ingredient in bringing up the skilled and successful entrepreneurs. Therefore, the above study makes it very clear that Mathematics plays an important role in the endeavors of an entrepreneur.

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