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# Why Is Learning Mathematics Essential and Lucrative For Students?

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**ABSTRACT:** This paper attempts to understand how analyzing mathematical problems can be beneficial for students and how it effectively boosts one's mental ability. Mathematics has consistently been linked with higher brain capacity and cognizant skills and through this paper we aim to explore how this becomes possible. Other lead areas in this paper include the various career opportunities that a mathematics major provides its recipient and how they can apply their knowledge in practical day to day life situations, knowingly and also unknowingly.

**KEYWORDS:** mathematics education, applied mathematics, Relation to cognizance, mathematics careers and research.

## I. INTRODUCTION

“Mathematics is the language with which God has written the universe.”, aptly said by **Galileo Galilei**, the seventeenth century Mathematician who went on to revolutionize the way we look at astrophysics today. Mathematics is the most elementary sort of logic attainable and so it's straightforward to reason that it is the best method of expressing the universe. Committing as a subject that is applied from the most basic of levels, to the most complex of unsolved and unanswered equations, it is, without a doubt, a Pandora's box that has continued to fascinate generations upon generations of the brightest of scientists. The role of mathematics in the society is invisible and all pervasive. Mathematics' role in the society has grown exponentially over the past few decades with the advancement in technology. The omnipresent mathematics is hidden in a plethora of apparatus, which function as black boxes for its users. In spite of the central role of mathematics in our society, we do not acknowledge mathematics and only a few people seem to partake in it. Thus mathematics is quite appropriately a paradox [7]. That being said, why should we, the common masses, engage ourselves with the language of the elites? Folks, here is why-

## II. THE PI THAT YOUR BRAIN NEEDS

Mathematics acts like a springboard in boosting your intelligence. It aids your brain's development by inculcating skills such as systematic thinking, logical and analytical thinking, problem solving, sequence and pattern recognition, etc. With regular practice, children and adults alike, foster concrete thinking which helps in buoying your brain muscles. Thereby Mathematics is, “**the food that your brain needs.**” Consistent with Tim Radford's analysis revealed within **The Guardian**, “Mathematics is sweet for all of your brain, not simply the elements that different activities cannot reach.” Therefore as a mathematics student, the expansion in your information of the sector is directly proportional to your brain power. In a recent study conducted under Researchers at Stanford University, **Tanya Evans and Vinod Menon**, spanning over 43 kids between the ages of 8 to 14, it was concluded that, “we identified three regions of the brain that predict improvement due to math learning — the posterior parietal cortex, ventrotemporal occipital cortex, and the prefrontal cortex. The volume of these regions varied between individuals; having more gray matter correlated with performing better in math over time.”[2]

### III. LOOKING AT OLD PROBLEMS FROM NEW ANGLES

It is a truth universally acknowledged by all Mathematicians that problem solving is central to their discipline. There are countless unsolved mysteries in mathematics that await their solution such as the Birch and Swinnerton-Dyer conjecture, Hodge conjecture, Navier–Stokes existence and smoothness, P versus NP problem, Poincaré conjecture, Riemann hypothesis, and Yang–Mills existence and mass gap. Solving these age old impossible predicaments has been a very prominent research field. It aims to bridge the gap between a student's knowledge and identify the processes required to **solve the million dollar problems. Literally.** The acquired knowledge further develops on conceptual framework, cognitive skills, metacognitive skills, social analysis and research, curriculum proposals, etc.

### IV. PENNY WISE AND POUND FOOLISH: APPROXIMATING YOUR BUDGET

Two of the most powerful M's of the world i.e. **Money and Mathematics are bound together irrevocably.** Learning mathematics gives you an edge in managing your finances. Whether it is cost-benefit ratio, managing your debts via calculating compound interest, figuring out your taxes, etc. every aspect of your budget moves vis-à-vis your mathematical skills. **Working out a budget** that works best for you, includes keeping a check on your spending over vacations, accommodation, grocery, etc. Budget constraints as defined by economics, handled via mathematics, depends on where you choose to spend, where to save, when to borrow and when to invest. The math skills you learn are also helpful in understanding how banks work as you manage your funds.

### V. THE SQUARE ROOT OF GREAT CAREERS

Do you have a sweet spot for the science of numbers? Wish to put your analytical skills to use and draw upon the career of your dreams? Look no further! Some of the highest paying careers that people with a major in mathematics can partake include Actuary, Data Scientist, Business Analyst, Economist, Statistician, Computer Programmer and of course, a Mathematician. The average package of students with a B.Sc. Mathematics is ₹7.5 LPA. A degree in mathematics is in required across all kinds of industries and its demand is expected to rise in the upcoming decades, with globalization in its full swing. Other relatively unknown but lucrative career options include Auditor, Research Analyst, Psychometrician, Supply Chain Manager, etc. Following an undergraduate degree in mathematics, students can also opt to study mathematics as a major for Masters and PhD. As it is a lucrative STEM course, it effectively develops skills in relative fields of Computer Science, Statistics, Finance, Information Technology, Game Theory, and so forth.

### VI. APPLICATION IN THE REAL WORLD

Watching a movie tonight? Sweet. Well what if you're watching it at 1.25x speed instead of the usual 1x? Assuming if the movie accounts for 120 minutes, then you would end up watching it in 96 minutes! Voila you just used mathematics! Let's take another case. Are you purchasing a house? Then **navigating percentages and mortgage rates** is directly related to understanding the basics of mathematics. Even in Interior Designing and Fashion Designing, concepts of geometry, ratios, percentages, calculus and statistics are used to a great extent. **Mathematics is everywhere.** Just pay attention. It is not only required for almost every profession out there but also applicable on most days of our lives! Knowing the distinct ways in which mathematics works, can open your eyes and help you look at the world in new light.

We come to know more about the relation between mathematics and our brain in **"Does Mathematical Study Develop Logical Thinking?"** by the education and psychological feature researchers **Matthew Inglis and Nina Attridge.** They link studying higher mathematics (at the advanced secondary and college levels) with an increase in logical ability[5]. Mathematics students think with clarity and analyze situations more critically.

### VII. CONCLUSION

When subjects become invisible, they are on the verge of disappearance. Especially for a subject as prominent as Mathematics in the school curriculum all over the world, this fate seems like a warped dystopian vision. However if we do

not constantly look out for the image of mathematics, we will see mounting pressure to lower the amount of mathematics at primary schools, secondary schools and at the university level [4].

It has been constantly suggested by scientists that a person with a penchant for manipulating numbers and understanding mathematical equations has a greater chance of doing better in life[1]. What has also long been speculated is that numeracy contributes more to employment, education and physical as well as mental health, than literacy[3]. Poor numeracy had a particularly negative effect on men's full-time employment in the 1980s recession, whether or not it was combined with poor literacy. [6]

Mathematics is the fundamental of our lives. The thumb rule to the way our world works. Studying mathematics And again, as **Galileo Galilei said, "If I were again beginning my studies, I would follow the advice of Plato and start with Mathematics."** Therefore, if one wishes to unlock the untapped potential of their brain, they must engage themselves in mathematics.

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