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Research Article

# Mathematical influence on the advancement of science, technology, and civilization

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### ABSTRACT

One area of science deal with number and their operation is known mathematics. It entails computation, calculation, problem-solving, etc. In the advancement of science, technology, and civilization, mathematics is crucial. The foundation for the development of computers and associated technologies is the binary or digital number system. We address the applicability of mathematics in several disciplines in this article. These disciplines are crucial into the advancement of science, society and technology. This topic is closely linked to the globe and natural occurrences. The philosopher, scientist, English Franciscan friar and scholar Roger Bacon said, "Neglect of mathematics works injury to all knowledge, since he who is ignorant of it cannot know the other sciences or the things of the world." Bacon lived in the thirteenth century. Physics and astronomy, two natural disciplines, are closely related to mathematics. Selection and peer-review under responsibility of scientific committee of editorial board members of Current Multi Science and author(s) and suggested reviewer.

### Introduction

Plants Hidden patterns that mathematics exposes aid in our understanding of the environment we live in. Nowadays, mathematics is a broad field that works with measurements, observations and facts of science, with inference, deduction, and evidence; it also deals with mathematical models of social systems, natural phenomena, and human behavior. It goes well beyond arithmetic and geometry. The definition of mathematics in its literal sense is "things which can be counted." While peoples may assume that counting plays a significant part in daily life will consider the following: months, students in a class, how would we be able to count family members, runs in a cricket match, rupees in our pockets, days in a week and years, if mathematics didn't exist at all? Fundamental math skills include adding, subtracting, dividing, counting and multiplying. Nature, too, fully accepts mathematics. We are very aware of and appreciate patterns, and we see a great deal of symmetry in the world around us. Any natural object may be observed to reveal symmetry or pattern. Day turning into darkness, summer becoming winter, and so forth. There are many instances of forms, symmetry and patterns in other things, objects, plants, images and animals are examples of this kind of stuff.

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A society is also known as human society, is sizable social grouping that inhabits the same virtual and physical region along collection of individuals bound by enduring relationships or a and is under the same governmental rule and prevailing cultural norms. In a broader sense, a society may be defined as an eclectic group of people that form an industrial, social, or economic infrastructure. We go over the following applications of mathematics in many fields:

#### **Mathematical Effect on Social Development:**

Since humans are social animals, mutual cooperation is essential to survival. Social skills are improved via group work. Collaborating with people to complete tasks may enhance a variety of social skills. Because mathematics involves give and take, it is necessary to understand it in order to function in society. Business and industry also rely on mathematical understanding. Numerous technical tasks in preliterate civilizations needed mathematical reasoning. An excellent illustration is the idea of proportionality. It is necessary for cooking as well as the manufacturing of a variety of mixed materials, including ceramics, glass, mortar, glue, and alloys. For example, a number of prehistoric societies produced bronze that was incredibly optimized and consistent in composition—a feat that would have been difficult to accomplish without a firm grasp of proportionality arithmetic. Only mathematics is to blame for the shift in the social structure brought about by contemporary conveniences like communication and transportation methods as well as advancements of science and technology. In other hand, mathematics has been crucial for development of society along to our comprehension of its growth.

#### **Mathematical Effect on Intellectual Development:**

Teaching mathematics is crucial for intellectual growth since it is the topic in the curriculum that stimulates students mind. Solving problems promotes the growth of mental abilities. Math problems need mental effort to solve. When a youngster encounters a mathematical issue, their brain starts working to find a solution. Every mathematical problem has this sequence, which is essential for both creative and constructive processes. In this manner, mathematics helps children develop all of their mental skills. Additionally, arithmetic makes a person very calculating, enabling them to save time, money, speech, thinking, and other resources. It cultivates self-reliance, patience, and a strong will. It also enhances one's capacity for creativity and ingenuity.

#### **Mathematical Impact on Vocational Development:**

The main objective of education is to assist students in becoming self-sufficient and capable of sustaining themselves. The most important subject to understand in order to do this is mathematics. It helps students become ready for professions in technology and other math-heavy disciplines including business, accounting, engineering, and architecture. Additionally, office work, surveying, construction, agriculture, and tailoring all need a working grasp of mathematics.

#### **Mathematical Effect on Moral Development:**

Morality is the critical life stage that is most impacted by place, time, people, and events. Mathematical knowledge helps shape personality and character, therefore learning mathematics may help pupils become more morally mature individuals. It fosters each and every trait that an honest person needs. A youngster picks up qualities like reality and purity.

#### **Impact of Mathematics on Spiritual Development:**

It seems that mathematics has the greatest potential for fostering introspection and, for those who are more open-minded, for cultivating an appreciation of the beauty in a solution. Solving mathematical puzzles is enjoyable, particularly when the solution provides the right answer. Every youngster feels content, self-assured, and independent at that point. A devoted "mathematics hater" could not see the beauty in a well-designed solution. As a result, the youngster receives support, fulfillment, and delight when they accomplish outstanding goals. As a result, mathematics fosters their artistic sense, satisfies a variety of interests, and aids in making the most of their free time.

**Mathematical Effect on Cultural Development:**

This helps students understand how important mathematics is to the development of civilization and culture. She or he is now more capable of appreciating the role mathematics plays in the fine arts and in improving humankind's quality of life.

**Mathematical Influence on the Evolution of the Educational System:**

Within the educational system, mathematics has a major role in shaping the future development of young people. Education should help people develop as individuals, become self-sufficient, knowledgeable, and valuable members of society. Almost every topic we study in school and college today, including physics, chemistry, life science, economics, business and accounting, geography, history, psychology, architecture, designing, calculations, statistics, and commerce, need a working knowledge of mathematics. Many vocations, such as sewing, carpets, cooking, beauticians, athletics, and others, demand mathematical proficiency. Even professions like conductor, merchant, driver, singer, magician, cashier, etc. need basic maths.

**Mathematical Contribution to the Advancement of Science and Technology:**

With an understanding of computer science and its applications, modern technology advances. All of the data that computers process and store, including words, numbers, pictures, movies, and music, is stored using the binary number system. Because 0s and 1s can be represented compactly and reliably in electromechanical devices having two states, such "on-off," the binary system is crucial to information theory and computer technology. The binary number system was developed by the ancient mathematician Pingala and serves as the foundation for modern digital technologies.

The significance of mathematics as the language of science, technology, and engineering, as well as its contribution to their advancement, account for its "functional" nature. It might be claimed that science and engineering cannot exist without mathematics, since this participation is as ancient as mathematics itself. The use of mathematical techniques in the social, medical, and physical sciences has grown significantly in recent years, proving that mathematics is a necessary component of all school curricula and driving a strong demand for college-level mathematical education. A large portion of the demand is directly related to the need of modeling phenomena mathematically and statistically. This kind of modeling forms the foundation of all engineering, is essential to the physical sciences, and has a major impact on the fields of biology, medicine, psychology, economics, and business. In the 20th and 21st centuries, mathematics has been effectively used in the advancement of science and technology.

**The Empowerment of Women via Mathematics Education's Impact:**

Mathematics is becoming an increasingly vital instrument for research and technology. Mathematics education continues to be a prominent subject in curriculum throughout school levels and in higher education and the workforce, despite the pervasive use of science and technology. The commotion that follows the announcement of math exam results has become an annual event. The postmortems of the results cast doubt on a number of areas where female pupils have lagged.

This has affected the courses and professions that women in the workforce are pursuing as well. They have blamed their lack of solid mathematical foundation knowledge for their inability to perform up to expectations. It is this knowledge that the abilities acquired in school have little to no influence on the kind of productive people society requires. Concerning this, gender disparities in enrollment, academic performance at the school, college, and university levels, as well as the job sector, were also factors. As our societies get more technologically advanced and mathematically oriented, achieving mathematical competences is receiving more emphasis.

**Mathematical Effect on Cultural and Moral Development:**

Although mathematics has inherent beauty and aesthetic appeal, its cultural significance is mostly derived from its perceived educational value. While the heavy reliance of mathematics on logical reasoning is seen to have educational merit in a world where rational thought and behavior are highly valued, the accomplishments and structures of mathematics are acknowledged as among the greatest intellectual achievements of the human species and, as such, are seen as worthy of study in and of themselves. Moreover, the overall goals of gaining knowledge and intellectual capacity are seen to be greatly aided by the possibility for honing the wit and problem-solving skills developed by studying mathematics.

### **The role of mathematics in the advancement of agriculture and medical science:**

Numerous fields and fields of study use mathematics, including epidemiology, agriculture, ecology, genetics, DNA sequencing, and tumor and cardiac models. It is used in the manufacturing of medical equipment, diagnostic instruments, and sensor technologies. Mathematics is special in a number of meaningful ways. First, because of its fundamental qualities as an abstract universal language and its roots in the sciences, technology, and engineering, mathematics has a claim to an inherently unique position from most other subjects. Second, as was already said, mathematics has a huge impact on every element of life, including the business and the individual citizen.

### **Mathematical Contribution to the Development of Economics:**

The study of mathematics is essential to contemporary civilization. It offers the essential foundation for understanding economics. In the physical sciences, technology, business, financial services, and many other ICT domains, it is essential. It is also becoming more and more significant in many social sciences, biology, and medicine. The majority of scientific and commercial research and development is based on mathematics. Modern complex systems and structures are becoming more and more understood solely by mathematical means, and a large portion of high-tech system design and control is dependent on mathematical inputs and outputs.

### **Summary:**

In human societies, mathematics serves a unique and crucial role that is strategically vital to the progress of humanity as a whole. The role mathematics plays in the construction of a civilization is shown by the geometrical understanding of space time, or the physical world and its natural patterns, combined with computer power and social organizing abilities. The fundamental building block of civilization is the human race, which also establishes governments and distributes natural resources for infrastructural development. The human race is the one that brings civilization forward. We will therefore discuss the ways in which mathematics fosters social and individual development. With the use of math, the individual may assess his ideas and conclusions more precisely. It is the area of human life and knowledge that is concerned with computations and numbers. It now plays a significant role in our everyday lives and is crucial to the development of the contemporary world.

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