

# The Role of Mathematical Model in Physical Development

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## Abstract

The mathematical action-is distance Measuring, Counting and Locating indicate clear connections between people and their environments. Through these kinds of mathematical model activities people design ways to meet their needs in efficient ways. This is away of saying that Mathematical tools of Physical Development. This paper seek to investigate & examine Mathematical Model for Physical Development. The social implication of Mathematical education for Physical scientific and technological development of the natural world and our relationship. The understanding progress in mathematical sciences is essential. Mathematics plays a big role in Physical Development and all of aspects: social, Environmental & Economic. Many Developmental challenges can be solved using appropriate Mathematical Models. This paper provides in dept technical discussion in "The Role of Mathematical Model in Physical Development and Real World Problems" with heartless Mathematical Models. The challenges such as illness & health, protection of use of natural resources, energy generation, global warming and environmental changes, globalization of the economy, urban development and traffic, labor Physical development and using Function and Relations, Architecture, Rights of people with special needs in using Geometry .

**Ajay Kumar Sonkar**  
Assistant Professor,  
Dept. of Mathematics,  
Government Degree  
College, Pawanikala  
Sonbhadra U.P., India

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## Introduction

The Scientific and Technological breakthrough has a tremendous impact in revolution many industrial & social activities of mankind. The assertion is correct, one would equivocally admit that there will be no scientific and technological development without proper Mathematics. It is known fact that Mathematics is the substructure of science & technology, its level of understanding among the people becomes a serious concern for scientific and technological education. This concern stems from the fact that if the level of Mathematics among the people remains so low, the Physical of the scientific and technological development so far attained become a mirage

The Mathematical education among the people, with the support of the Mathematical processing and control machine called the computer; significant advancements are realized in science, technology & arts. Mathematics is universal not only to science and science related areas, engineering and technology, but also in a way it makes itself relevant to the development of the social science and the liberal arts. Mathematics is the world could not have been what it is today. Mathematics is the study of topics such as quantity, structure, space & change. These topics provide the major subdivisions of Mathematics into: Arithmetic, Algebra, Calculus of variation, Geometry, Analysis, operation Research and computational technique. These major disciplines within Mathematics areas out of the need to do calculation in commerce and trade. Apart from an Engineer, a Businessman, an Industrialist, a Banker, even a laborer has to calculate his wages make purchases from the market ,and adjust the expenditure to his income. But is Mathematics all about calculation?

People believe mathematics is a divine discipline. For instance, Galileo, in Obodo (2004),stated that mathematics in language with which God wrote the universe. Some people love mathematics while some fear it; some are attracted too and study mathematics, while some worship it. For instance, ancient Indian mathematician like Aryabhata and Bhaskaracharya worshipped mathematics and live for it .Also the legend Srinivasan Ramanujan of India adored mathematics. These could be material & nonmaterial reason why people adore, worship and are attracted mathematics. Why should everybody learn mathematics? How does mathematics contribute to overall development of the embers of the society? What is significance of mathematics in the society? What should be the advantages of devoting so much effort, time and money

of the society to learn mathematics? According to Kulshrestha (2005), these equations indicate the way to explore the value of mathematics.

**Thus mathematics importance therefore will be presented in the following ways**

1. The language of mathematics
2. Usefulness of mathematics in human daily activities
3. Aesthetic values of mathematics education
4. The role of mathematics in science and medicine
5. The Role of Mathematical Modeling
6. The Role of Physical Modeling
7. The role of mathematics in Law and social sciences
8. The role of mathematics in Engineering and Technology

**Objective of the Study**

First, clearly present the gist of your idea, what is the main problem / question that you are dealing with in this paper? What are the goals/objectives of your research? Why it is an interesting/ significant problem?

**Language of mathematics**

The universal language of mathematical acts across cultures uses carefully defined terms and concise symbolic representation to add precision to communication. The grammar of the language, its proper usage is determined by the rule of logic. The study of mathematics form in students the habit of clarity, brevity, accuracy, precision and certainty in expression and this go a long way to unit us in the country. There for the idea of logic rest valid conclusion upon the validity and consistency of assumptions and definitions to eliminate frequent conflicts in homes. The vocabulary of mathematics language consists of symbols such as addition, multiplication, subtraction, division, summation, square root, exponential, differentiation, integration etc.

**Usefulness of Mathematics in Human Daily Activities**

Shaping up with everyday mathematics. Shapes and space, is the oldest branch of mathematics. Thinking in numbers. Arithmetic crops up a lot in daily life. Lies, damned lies. Newspapers and TV news are full of statistics. Algebra and equations. A real world example of using algebra is pricing. Fractions, decimals and percentages daily uses life in other words.

We all should understand the way number in applied to measure lengths, volume, weight, area, density, temperature, speed, acceleration and pressure. Estimation and approximation helps them to check economic waste in every day life. The study of mathematics will form in the habit of clarity, brevity, accuracy, precision and certainty in expression and this will be long way in giving us much-needed unity in this nation. In homes, office market places. The Role of Physical Modeling, road pathway, playgrounds get involved in one argument or the other. The success in any argument dependents on persuading and there is nothing more persuading than a logical argument. The importance of mathematics to individuals in their daily undertaking is so enormous that the knowledge of mathematics is an indispensable tool for a successful and balanced human existence on earth. The mathematics help man to sharpen his understanding and definition of religious concepts. Such concepts as eternity, heaven, sprit life, power, salvation, strength, light, hope, faith, glory, blessing, truth, grace, peace, neighbor, height, depth, righteousness, earth, sun and death can each be defined with mathematical rigor and precision (Osah-Ogulu and Odili, 2000).

**Aesthetic Values of Mathematics Education**

Aesthetic is concerned with beauty and art, and understanding of beautiful things (Horns by,2001). Aesthetic qualities include: variety, integrity, diversity and harmony. Aesthetic value in mathematics refer to the beauty of mathematics or beauty in mathematics. One may ask is mathematics beautiful? What mathematics is beautiful? What problems are associates with the study of the beauty of mathematics? Can the beautiful image of mathematics be integrated in the context of pedagogy? Russell in Agwagah (2008) expressed his sense of mathematics beauty in these worlds.

This implies that the mathematics do not study pure mathematics because it is useful, but because he delights. These point s to the mathematics is beautiful. Mathematics try to identify the smallest set of rules from which many other proposition can be logically derived. There are topics in mathematics, which can be used to illustrate its aesthetic element of power. Example is the number notational system (Bett, 2007). Using 10 symbols-1,2,3,4,5,6,7,8,9,0 .It is possible to create an infinite number of

distinct number. The reason is because of the amazing power of place value notation. The practical utility of mathematics can be shown in many ways. For instance the universe is made of galaxies, mountain, creature, vehicles, and all manner of other things each seemingly unique. But thanks to mathematics, people are able to think about the world of objects and happenings and to communicate those thoughts in ways that reveal unity and order. The number, lines, angles, shapes, dimensions, averages, probabilities, ratios operations, cycle, correlations regressions, etc that make of the world of mathematics enable people to make sense of the universe that otherwise might seem to be hopelessly complicated (Agwagah ,2008) circles ,squares, triangles and other shapes can be found in things in nature and things that people build. Numbers and shapes can be describe many things I the world. The letters and words make up a language in reading and writing, numbers and shapes make up a languages in mathematics. Numbers shapes and operation on them, help to describe and predict things about the world around us.

### **Role of Mathematics in Science and Medicine**

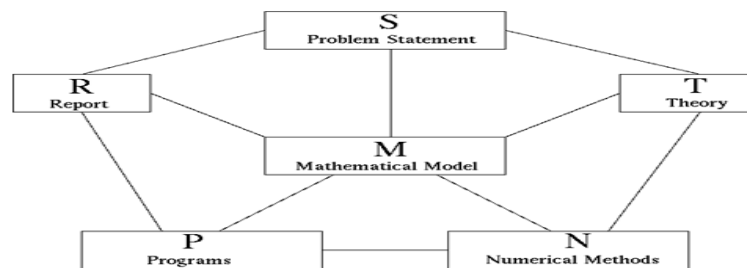
Role of Mathematics in Science to the scientist, mathematics is an analytic tool applied to experimental data with the hope of generating a formula that describes some basic tendency of nature. Also mathematics can be used with existing theory to deduce an unknown quantity. Mathematics and Science have a long and close relationship that is of crucial and growing importance for both. Mathematics apart from being and intellectually stimulating discipline ,is continuously being developed to meet the changing requirement of , Physics , Chemistry , Biology , Social Sciences , Psychology, Engineering and even law to mention a few. Every occupation within the medical field relies heavily on Mathematics. Elementary Mathematics Algebra, Trigonometry, calculus, Coordinate Geometry, Statistics, and Dynamics of all obviously crucial to advance in new technology, saving lives and diseases



### **Role of Mathematical Models**

of

Mathematical models help us to clarify relationships among a system 's components as well as their relative significance . Through Model, speculations about a system are given a form that allows them to be examined qualitatively and quantitatively from many angles; in particular Models allows the detection of discrepancies between theory and reality, its every where Mathematical formulae & Models may be applied to test the structural and functional soundness of the design before it is mass produced, thus saving millions of dollars and untold time. Computer- aided design is becoming increasingly important in this type of us and it is all based on application of Mathematics. Mathematical models are used not only in the natural science (such as Physics, Chemistry, Biology, Earth science, Meteorology, Hydrodynamics) and Engineering disciplines(Computer science, construction, manufacturing, artificial intelligence) but also in the social sciences9SUCH AS Economics, Psychology, Sociology and Political sciences) Physicists, Engineer, Statisticians, operation research analysts and Economists use Mathematical models most extensively(Dangelmayr,2005).Mathematical models can take many forms, including but not limited to dynamical systems, statistical models, differential equations or game theoretic models. Mathematical models may include logical models, as for as logic is taken to be part of Mathematics. In many cases, the quality of scientific fields depends on how well the mathematical models developed on the theoretical side agree with results of repeatable experiments. Lack of agreement between theoretical mathematical model and experimental measurements often lead to important advances as better theories are developed(Benda,2000).



## Role of Physical Modes

The purpose of a physical model on a larger scale may be to see the structure of things that are normally too small to properly or to see at all, for example, a model of an insect or of a molecule. Physical models are used for many applications, including the flow of fuels through bunkers and silos, the flow of fuels through burners, the flow of air through wind boxes of boilers and the flow of gases through ductwork and air pollution. Advantages of physical models include accuracy, safety, visualization, education, and trying things out that would be impossible in the real world due to safety, cost or practical concerns. You can visualize things that are extremely tiny, happened millions of years ago, or that otherwise can't be viewed directly.

## Role of Mathematics in Law and Social Sciences

The application of Mathematics in law is not used, in direct forms in other disciplines. The principles of Mathematics use reasoning forms as the basis for its understanding. Prospective law students with a mathematical background perform better in some areas such as ownership right, power, justice, crime, guilt, trial, conviction. The Role of Physical Modeling evidence, suspect, constitution, charge, offence count, liability etc are now defined with mathematical precision (Gemignani, 1979). Therefore, the impact of Mathematics in law is enjoyed by the mathematically literate form. Attorneys use mathematical skills such as problem solving and logic in their everyday business activities. Much like a math problem, attorneys in court need to illustrate step-by-step their knowledge of the case. Mathematics is of central importance to modern society. It provides the vital underpinning of the knowledge of economy. It is essential in the physical sciences, technology, business, financial services and many areas of ICT. It is also of growing importance in biology, medicine and many of the social sciences. The social sciences also depend on mathematics. For example; In finance-constraints in linear programming techniques and probability. In insurance business-constructing life tables premium rates, equity linked contracts, ruin theory, discounted cash flow and time series, in geography-measurement of distance, areas on maps using map projectors, the study of the solar system the determination of the shape and the size of the earth, the distance of the horizon, the indivisibility of objects, the relationship between longitude and time, nautical miles, the use of national grid in ordinance survey maps and interpretation of contour maps, have all been made possible through expert application and knowledge of geometry and Trigonometry. In education, mathematics is used in educational planning and evaluation, test and measurement, information systems, design and implementation. Mathematical trend analysis, financial/cost analysis, school mapping, operation research, parameter estimation, time series analysis, cohort analysis, descriptive/ financial statistical analysis.

## Role of Mathematics in Engineering and Technology

Mathematics is the heart of engineering, whether it be mechanical, civil, computer science or chemical engineering, mathematics play an important role in almost every branch of engineering. Fakuade and Odili (2006) claim that the mathematician-engineer as he is more likely to make effective use of mathematics. In the engineering field the search for the problem, generalization of the solution and interpretation of results, all have recourse to the use of mathematics. Mathematics have dominated the scene in the aircraft technological development especially by way of research in aeronautics and in the structure of aircraft itself. All the mathematical results obtained from the solution of these equations lead to decisions on viscosity of the air, the steadiness of the motion of the airplane, external forces acting on the body of the airplane, the conditions to the air traffic have largely relied on the use of electronic digital computers, which is a major branch of mathematics. When you enter into any

stream of engineering, in the first year you will have to study engineering mathematics and it is compulsory course in every college. This is because mathematics help you to explore engineering skills very well. It is only that mathematics makes your mind sharp. A student who is good in mathematics can learn almost any stream of engineering. It helps you in every parts of life whether it be a calculation or measurement. The base of engineering lies in mathematics only. So good luck to the mathematics lovers in all subjects .Mathematics is a very important subject in engineering since one concept or another is required in all fields of engineering which would help us in understanding how those concepts work when we actually read it. Integration, differentiation, and Laplace (a bit) are required in electrical and electronics engineering especially in signals, waveform etc while Laplace, differentiation, integration plays an important role in solving equations in computers which are used to find time complexity of a program. Without a bit of knowledge of mathematics particularly these concepts, one would have a difficult time in understanding what is actually thought in some of the core subjects irrespective of which branch he is doing his engineering in. Mathematics can be seen as a “tool” among a series of tools used in the process of solving an engineering problem. Designing a structural beam, an aerospace component, a digital circuit, or any other engineering system will require the use of basic mathematic principles. Of course mathematics goes beyond its purpose as a tool and it is actually the “study” of mathematics that provides a foundation of analytic and problem solving skills. All these ideas depends of the knowledge and application of mathematics that one could almost say that without mathematics, the world could not have been what it is today

### Conclusion

The use of mathematics and especially now with the support of the mathematical & physical processing and control machine called the computer, significant advancement are realized in science, technology and arts. The application of mathematics within the context of the socio- culture environment of man produces harmony, order and peace. It provides serene beauty in man's physical environment (aesthetic values). It is difficult to imagine how such field as accountancy, engineering, natural and applied sciences, land surveying, quantity surveying, modern corporate management, education, medicine, banking, finance, actual science, architecture, fine and industrial arts, etc could get along in their services to humanity without mathematics. It becomes necessary that school administrators, teacher parents/ guardians and student should now view mathematics as an all important subject for making sustenance and development of our society in 21th century and beyond. What is needed now is more mathematics and not less for our industrial growth , since mathematics as science number ,quantities and measurement will continue to provide us with empirical statistical data upon which we can based sound decisions in our developmental efforts. While teachers should expose students to various representations of a mathematical idea, he/she should provide opportunities in class for students initiative, independence and creativity in the mathematics classroom.

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