INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN : 2277-7881
VOLUME 2, ISSUE 2(1), FEBRUARY 2013

MATHEMATICS –A MULTIDIMENSIONAL WEAPON FOR ALL-ROUND DEVELOPMENT: A DISCUSSION

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Abstract: An attempt is made in this chapter to present the role of mathematics in the societal development. Majority believe that mathematics confines to solve equations. Here the author discussing several benefits of the mathematics. In order to live a social life, mathematical knowledge is needed, because of the give and take process, business and industry depends upon the knowledge of Mathematics. The change in the social structure with regards to the modern facilities like mode of transport, means of communication and progress in the field of science and technology is due to mathematics only. In this way mathematics has played an important role in not only understanding the progress of society but also to develop the society.

Introduction

The literal meaning of mathematics is "things which can be counted" now you can think that counting has vital role in our daily life; just imagine that there were no mathematics at all, how would it be possible for us to count members of the family, number of students in the class, rupees in the pocket, runs in a cricket match, days in a week or in a months or years? On a basic level you need to be able to count, add, subtract, multiply, and divide. At a psychological level, exposure to mathematics helps in developing an analytic mind and assists in better organization of ideas and accurate expression of thoughts. At a more general level, far away from dealing with the higher mathematical concepts, the importance of mathematics for a

common man underpinned. A common man is being increasingly dependent upon the application of science and technology in the day-to-day activities of life, the role of mathematics has undoubtedly been redefined.

Mathematics is around us. It is present in different forms; Right from getting up in early hours of the day to the ringing of an alarm, reading time on a watch, rounding a date on a calendar, picking up the phone, preparing a recipe in the kitchen, to wait for the counts of whistles of the cooker, manage the money, travel to some place, to exchange currency at a ticket outlet while availing a public conveyance or checking up the mileage of your car, halting at the filling station, attending to a roll call at school, getting scores in the class exams, even meet new friends the list is just endless if one goes on to note down the situations when our computational skill, or more specifically, simple mathematics comes to play a role, almost every next moment we do the simple calculations at the back of our mind. Of course these are all done pretty unconsciously without a thought being spared for the use of mathematics on all such occasions.

Even when we think of role of mathematics in our recreational activities, we surprisingly have a list that runs quite long: video games, computer games, puzzles, riddles, hockey, cricket, kho- kho, kabaddi, football, basketball etc. A cricket captain once said that if he got his field placement right, half the job of getting the other team out would be done. And what does field placement require? An astute sense of the game and of space; all the above games require an instinctive awareness and utilization of space. While doing crosswords, we need to see length of the words we fill in, the matching of the common letters, and so on. What about board games like chess? While playing, you need to think of a winning strategy. For this you need to construct the possible movement at any instant, giving the conditions under which the different pieces are allowed to move. In Ludo, Chaupad, Trade, and

other such games, the players use a lot of mathematics. It scares us to certain extent to think of a life without any knowledge of calculation or computation, or in other words mathematics.

Significance of Mathematics in dynamic World

The need to understand and be able to use mathematics in everyday life and in the workplace has never been greater and will continue to increase.

Mathematics for Life: Knowing mathematics can be personally satisfying and empowering. The underpinnings of everyday life are increasingly mathematical and technological. For instance, making purchasing decisions, choosing insurance or health plans, and voting knowledgeably all call for quantitative sophistication

Mathematics as a part of Cultural Heritage: Mathematics is one of the greatest cultural and Intellectual achievements of human-kind, and citizens should develop an appreciation and Understanding of that achievement, including its aesthetic and even recreational aspects.

Mathematics for the Workplace: Just as the level of mathematics needed for intelligent citizenship has increased dramatically, so too has the level of mathematical thinking and problem solving needed in the workplace, in professional areas ranging from health care to graphic design.

Mathematics for the Scientific and Technical Community: Although all careers require a foundation of mathematical knowledge, some are mathematics intensive. More students must pursue an educational path that will prepare them for lifelong work as mathematicians, statisticians, engineers, and scientists. In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their

futures. Mathematical competence opens doors to productive futures. A lack of mathematical competence keeps those doors closed.

Generally it is an assumption that mathematics is only for the select few. On the contrary, everyone needs to understand mathematics. All students should have the opportunity and the support necessary to learn significant mathematics with depth and understanding. There is no conflict between equity and excellence. Principles and Standards call for a common foundation of mathematics to be learned by all students.

Mathematics and development of the society

Role of Mathematics in Social Development

Man is a social animal and human life depends upon the co-operation of each other. Group work helps social skills. The ability to work together on tasks with others can build various social skills. In order to live a social life, mathematical knowledge is needed, because of the give and take process, business and industry depends upon the knowledge of Mathematics. The change in the social structure with regards to the modern facilities like mode of transport, means of communication and progress in the field of science and technology is due to mathematics only. In this way mathematics has played an important role in not only understanding the progress of society but also to develop the society.

Role of Mathematics in Intellectual Development

Mathematics teaching is very important for intellectual developments there is no other subject in the curriculum likes mathematics which make students brain active. Problem solving helps in the development of mental faculties. Mental work is needed to solve mathematical problems. If a child, has a mathematical problem her/his brain becomes active in solving that problem. Each problem of mathematics possess such sequence which is necessary for constructive and creative process. In this way, all-mental abilities of child are developed through

mathematics. Moreover, mathematics makes the man very calculating so that she/he cans economies time, money, speech, thought etc. It develops a strong will power, patience and self-reliance. It, also develop the faculty of discovery and invention.

Role of Mathematics in Vocational Development

The main aim of education is to help the children to earn their living and to make them self-independent. To achieve this aim mathematics is the most important subject than any other. It (this aim) helps to prepare students for technical and other vocations where mathematics is applied e.g. engineering, architecture, accountancy, banking, business, even the agriculture, tailoring, carpentry, surveying, and the office work requires the knowledge of mathematics.

Role of Mathematics in Moral Development

Morality is the important phase of life, which is most, affected by time, person, situation and place. As a subject, mathematics can added to students moral development since mathematical knowledge is helpful in character and personality development. It develops all those quantities which a person of strong character must posses. Child develops qualities of cleanliness, reality.

Mathematics in Spiritual Development

Mathematics main potential here seems to be regarding developing the skills of reflection and possibly, for the more receptive, a sense of the beauty of a solution. One gets pleasure in solving mathematical problems, especially when she/he gets the correct answers to her/his problem .At that moment every child feels satisfied, confident and self-reliance. The aesthetic quality of an elegant solution is something that may be lost on a dedicated "mathematics hater". So the child gets encouragement, satisfaction and happiness in attaining remarkable achievements. Therefore mathematics helps to develop their aesthetic

sensibility, meets the varying interests and helps them in the proper utilization of their leisure time.

Mathematics in Cultural Development

This helps the learner to understand the contribution of mathematics in the development of civilization and culture. It has enabled her/him to understand the role of mathematics in fine arts and in beatifying human life.

Role of Mathematics in the Development of Education System:

In education system, mathematics plays an important role in shaping the future probability of young people. Education is to develop an individual, to make her/him self-reliant, to make her/him wise, to make her/ him a social contributor and in our education system, for almost every subject, we study in school and university; we need to study mathematics too e.g., Physics, Chemistry, Life-Science, Economics, Business and Accountancy, Geography, History, Psychology, Architect, Designing, Computes, Statistics, Commerce etc. Also in vocational areas like Tailoring, Carpenting, Cooking, Beauticians, Sportsperson, Farming etc, mathematical knowledge is needed. Even the professions like, Conductor, Shop Keeper, Drivers, Musicians, Magicians, Cashiers etc use basic mathematical concepts.

Mathematics in Development of Economics:

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. Mathematics forms the basis of most scientific and industrial research and development. Increasingly, many complex systems and structures in the modern world can only be understood using mathematics and much of the design and control of

high-technology systems depends on mathematical inputs and outputs. Economics of the society is developed by establishment of industries. The applied mathematics like computational science, applied analysis, optimization, differential equation, data analysis and discrete mathematics etc are essential in industrial field. By application of mathematical methods, the exploration cost of oil and communication cost of images could be reduced. Techniques of wavelets and fractals are used for this purpose. Numerical simulation of mathematical models helps to manufacture super conductor cables to reduce the cost of electricity.

Mathematics in Development of Infrastructure:

In particular, mathematics has contributed to progress in science and technology for thousands of years and still continues to do so. It finds useful applications in development of infrastructure i.e., business, industry, music, politics, sports, medicine, agriculture, engineering, and the social and natural sciences. The physical appearance and development of infrastructure is crucial in a society. Thus, for the construction of roads, buildings, stadiums, flyovers, airports, dams, bridges, vehicles, airplanes etc. in mechanical engineering, civil engineering, electrical engineering etc

Mathematics in Development of Science and Technology:

The "functional" aspect of mathematics stems from its importance as the language of Science, Technology and Engineering, and its role in their development. This involvement is as old as mathematics itself and it can be argued that, without mathematics, there can be neither science nor engineering. In modern times, adoption of mathematical methods in the social, medical and physical sciences has expanded rapidly, confirming mathematics as an indispensable part of all school curricula and creating great demand for university-level mathematical training. Much of the demand stems directly from the need for

mathematical and statistical modeling of phenomena. Such modeling is basic to all engineering, plays a vital role in all physical sciences and contributes significantly to the biological sciences, medicine, psychology, economics and commerce.

Mathematics in Development of Medical Science and Agricultural field:

Mathematics is applied to agriculture, ecology, epidemiology, tumor and cardiac modeling, DNA sequencing and gene technology. It is used to manufacture medical devices and diagnostics, opto-electronics and sensor technology.

There are positive senses in which mathematics is special. First, by virtue of its fundamental nature as a universal abstract language and its underpinning of the sciences, technology and engineering, mathematics has a claim to an inherently different status from most other disciplines. Secondly, as we have set out above, mathematics is fundamentally important in an all-pervasive way, both for the workplace and for the individual citizen

Mathematics in Cultural and Moral Development:

Mathematics has its own intrinsic beauty and aesthetic appeal, but its cultural role is determined mainly by its perceived educational qualities. The achievements and structures of mathematics are recognized as being among the greatest intellectual attainments of the human species and, therefore, are seen as being worthy of study in their own right, while the heavy reliance of mathematics on logical reasoning is seen to have educational merit in a world where rational thought and behaviour are highly valued. Furthermore the potential for sharpening the wit and problem-solving abilities fostered by study of mathematics is also seen as contributing significantly to the general objectives of acquiring wisdom and intellectual capabilities.

A cultured citizen is one who follows the norms of society and one who is a civilized person. A well mannered person is always simple, original, patient, honest, accurate and disciplined. Mathematics is a subject which is exact, real, original and precise, and one who studies mathematics needs to follow the laws and rules.

Thus, mathematics helps the people to be cultured citizens having sound morals.

7. Mathematics in the Development of Living Standards.

Since mathematics is used in almost every profession, it helps in improving the living-standards of a person. The developments in economics, science and technology, medicine in brief over-all development of society develops the standard of living. Thus, mathematics plays an important role in making the living standards high. Although the ubiquitous use of information technology in all sectors has changed the nature of the mathematical skills required, it has not reduced the need for mathematics.

Last but not the least any society can never be developed without the empowerment of women since women is the half part of the society. Therefore, we will also see the, role of mathematics education in women empowerment

Mathematics Education in Women Empowerment

The importance of Mathematics as a tool for science and technology is continually increasing. While science and technology have become so pervasive, mathematics education has continued to dominate the school curriculum and remains a key subject area requirement in higher education and employment sector.

CONCLUSION

The hue and cry which follows the publication of mathematics results has become an annual ritual. The postmortems about the

results eclipse a number of areas where female students have lagged behind. This has also impacted on courses and careers sought by women in the working world. They have attributed their failure to perform to expected standards to lack of sound background knowledge of mathematics. It is this realization that the skills learnt at school have had very little if any, bearing on what society needs in terms of productive citizens.

Ashlock, R.B. and Herman Jr. W.L, *Current Research in Elementary School Mathematics*, New York: Macmillan, 1970.

James.Anice, *Teaching of Mathematics*, Neelkamal Publication Pvt. Ltd. Hyderabad

Kulshishtha, A.K. *Teaching of Mathematics*, R. Lall Book Depot, Meerut-250001

Miglani,R.K. & Singh, D.P. *Teaching of Mathematics At Elementary Level* Part I & Part II, Arya Book Depot Karol Bagh, New Delhi-110005

National Curriculum Framework 2005 (NCF-2005)-A Paradigm Shift-Mathematics (2005); NCERT publications, New Delhi