



TEACHING OF MATHEMATICS: A SEARCH FOR AN ALTERNATIVE SPHERE

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Abstract:

Mathematics is the science of number. It studies quantities, shapes and motions of physical objects. Moreover, it studies about counting, calculation and measurement. It happens to exist in every phenomenon of life. It has been dwelling with us in disguise for thousand years. It left traces in caves, the first home of human race. The practical mathematics was evidenced in 'tallies' of 1800 B.C. Babylonians and Egyptians had started doing arithmetic, algebra, geometry and other financial calculation in 3000B.C. They applied mathematical formulae to build magnificent structure and buildings. They used mathematics to study natural science i.e. the laws of stars and celestial objects. Consequently, mathematics started evolving in tradition and culture. A kid acquires the sense of number, addition and subtraction before he/she steps into a school. Folk games and traditional activities help a kid to learn the basics of mathematics. In this regard, traditional folk tales, riddles and rituals also help kids to acquire primary lesson of mathematics. Thus outer world laid the foundation stone of mathematics. A person gets the idea of number in early stage. He/she can easily do simple sum like addition and subtraction without going to school. Later on he/she finds Mathematics as bizarre subject. He/she finds the subject very difficult in the class room. Thus he/she develops math phobia. A kid hears of number in a playground. Playground is the first mathematical class. A person learns how to subtract and sum two or more digits in the playground. Thus the person grows affinity to numbers. But as soon as he/she gets into a school, he/she starts to scare numbers. They feel annoyed of Mathematics. The present paper tries to focus on why school going kids feel frighten of Mathematics. It tries to find out possible tools applying which one can make it an interesting subject. This paper is primarily based on first hand experiences acquired by the author in different situations while interacting with school going students and their parents. The author of the paper has consulted secondary sources. Accordingly, primary and secondary sources are being used here as methodology.

Keywords: Mathematics, Folk-teaching, Classroom drilling, Alternative sphere

Introduction:

People frame certain notions according to their experiences. Mostly people believe that mathematics is a tough subject. They believe that Mathematics is meant for those who are sharp in academics. Mathematics deals with quantity (number theory), structure (algebra) {Kneebone 1963:4}, Space (geometry) and Change (mathematical analysis) {LoTorre 2011:2}. Therefore, it appears very difficult. Stephen Hawkins denied the notion that everything of science is interpreted by mathematical equation. He said 'where did the universe come from? How and why did it begin? Will it come to an end, and if so, how? These are the questions that are of interest to all. But modern science has become so technical that only a very small number of specialists are able to master the mathematics used to describe them. Yet the basic ideas about the origin and fate can be stated without mathematics in a form that people without a scientific education can understand' {Hawking 1989:VI}. Hawkins in his statement clearly stated that mathematics is needed to understand cosmos technically. But mathematics and scientific education is not all in all. There are other means too as alternatives.

The 21st century is an era of information. It emerges various discourses. People start to look at subjects with fresh perspective. Subjects are inter /intra disciplinarily emerged. Mathematics is not a subject now of pure science. It opens new avenues for them who simply pursues the subject in arts stream. But people have had some make believes about the subject. They believe that it is a tough subject. They often feel reluctant to talk about mathematics. Mostly people do not participate in mathematical discussions. They think that mathematics is beyond their understanding. And thus the distance between man and mathematics rises. School is a place where one's brain gets food. A person's self also should be taken care of by school. His/her brain and self should be given equal importance in school. School 'is an integral part of human world, with reference to which, and in terms of which, individuals make decisions and orient their behaviour' (Jenkins 2004:157). But teaching quality of schools is not beyond questions. It appears that a school passed out student fails to do simple calculations, deduction and multiplications. Obviously teachers are not liable for their students' inability to solve easy sum. But their teaching method is partially erroneous. They do not able to create interest for maths among dull students. Ivan Illich, a theorist, said in 'De-schooling Society' that 'education is not concerned with the acquisition of particular skills. It liberates one's experience. It helps an individual to explore, create, and use his initiative and judgement. It helps an individual to use freely his teaching skills' (Haralamos 1980:223). But it is found that teachers seldom apply new tools in mathematics class. They teach mathematics in traditional way. And thus the subject fails to penetrate students' heart. Subsequently, students mind and heart shift to other subjects which they learn sportingly.

Mathematics is a language. It can describe the whole galaxy. Numbers, calculations, equations etc. are mathematical alphabets. One can describe or summarize whole phenomenon with the help of mathematics. Yet people scare mathematics as a subject. They do not want to pursue mathematics for higher study. They develop phobia for mathematics in school days. Consequently, phobia lingers on. Mathematics needs a mathematical friendly condition to grow. Children get closed to mother and grandmother in their childhood days. Old ones of the family use to tell fairy tales to their children. The fairy tales undoubtedly develop their minds. They help them to imagine. And thus unknowingly they start to put seeds of literature into their minds and hearts. Children start growing listening folk narratives. Children are asked to read rhymes. They are asked to read rhymes to entertain visitors and guest. They are not asked to read table or to count number/ number rhymes either. They crackle rhymes one after another and then take leave. Parents need to involve their children in numerical activities. They can start certain games based on addition and subtraction. They can provide game accessories, toys, dice carved with numbers. They can play tricky games with children. They can teach some funny ways to remember tables. Children will enjoy finding the table of 7 as follows:

Column 1

0	1	2
2	3	4
4	5	6

Column 2

07	14	21
28	35	42
49	56	63

One can also remember the table 9 in tricky way. At first one has to write 0 to 9 in descending order and then 0 to 9 in ascending order as follows:

Table of 9	1 st Step	2 nd Step	Combined Digit
	↓	↑	
9 x 1 =	0	9	09
9 x 2 =	1	8	18
9 x 3 =	2	7	27
9 x 4 =	3	6	36
9 x 5 =	4	5	45
9 x 6 =	5	4	54
9 x 7 =	6	3	63
9 x 8 =	7	2	72
9 x 9 =	8	1	81
9 x 10 =	9	0	90

Mathematics is based on assumption 'x'. People usually make fun the assumption. They term the 'x' as hypothesis. But 'x' is near to fact or fact itself. 'x' is a true assumption. Assumption or notion of certain thing helps in reaching near to truth. One cannot achieve truth or go near to it without some sort of notion of what one is looking for, observation is pretty hopeless. Therefore, mocking 'x' as hypothesis is stupidity. It shows one's lack of knowledge about the subject. Everybody regardless of their occupation should take care of mathematics. They try to generate positive vibes about mathematics. For example parents can draw their children's attention, ask them to solve sums orally, give them some multiplications, subtraction and addition. They can encourage them. They can appreciate their involvement. They can pamper their child. Thus, they feel good. They feel encouraged to solve mathematical sum. And thus they can be given the idea of 'x'. They can be given some sums, as for example: a number and its double is 2343. What is the number? Initially, the child cannot answer. But he/ she cannot run away. He/she wants to solve the sum. Their positive foundation helps them to solve the sum. Thus the unknown variable 'x' starts digging their heads. It appears to them as a new toy to play with. Consequently, they start learning about 'x' as follows:

Let the number = x
 It's double = 2x
 Therefore, x+2x= 2343
 Or 3x= 2343
 Or x = 2343/3
 Or x = 781

Students can derive some more tricks from mathematics. They can pass their leisure time doing funny subtraction. They can enhance their interest in mathematics in playful way. Let's take the following example:

A asks B to write a two digit number.
 B writes a two digit number i.e. 89
 A again asks B to subtract the sum of the above digits
 B subtracts the two digits $8 + 9 = 17$ from 89

B gets the result as follows:
$$\begin{array}{r} 89 \\ -17 \\ \hline \end{array}$$

= 72

A again asks B tell him any of the total digits 72. If B tells 2 then A easily replies what is second digit of the sum and vice versa. The fun is the total of two digits always remains same i.e. 9. 9 is a constant number. Pupils can pass quality time playing with numbers. Teachers also can apply such tricky mathematical games to draw pupils' attention to Mathematics. They can also give the following game:

259 x "someone's age" x 39 =?

If the age of a person is 19 years then $259 \times 19 \times 39 = 191919$

The age of the person occurs three times.

Teachers can also show one more tricky multiplication as follows:

$$\begin{aligned}
 1 \times 1 &= 1 \\
 11 \times 11 &= 121 \\
 111 \times 111 &= 12321 \\
 1111 \times 1111 &= 1234321 \\
 11111 \times 11111 &= 123454321 \\
 111111 \times 111111 &= 12345654321 \\
 1111111 \times 1111111 &= 1234567654321 \\
 11111111 \times 11111111 &= 123456787654321 \\
 111111111 \times 111111111 &= 12345678987654321
 \end{aligned}$$

The multiplication of eevens is drilling one. But one can multiply eevens easily. One has to place digits in descending and ascending order as shown above to multiply so many equal numbers of eevens. The school teachers can apply above stated maths and magic of numbers to draw students' attention. Mathematics is a dull subject. School going children get bored of math. They dread numbers because they cannot able to substantiate them. And thus they grow with math phobia. Later on bright students start feeling dismayed. But children do not take birth with math's phobia. The system of teaching derails them. Therefore, school teachers can apply different tools to teach maths. They can make mathematics teaching entertaining and create an alternative sphere for students so that they can get rid of maths phobia. Teachers can discover certain tools to teach basics of math so that students can take part. Teachers must not try to teach maths to their students. They should create interest about numbers among their students. Once they start loving numbers and digits, they start loving the subject. Teachers have to remember that children are fond of playing games. Games have scores and 'scores mean the mathematical digit. Teachers can give the idea of numbers in a playful way. They can give idea of different geometrical shapes while playing Carom, Ludoo (Indoor games) and Kabadi (Outdoor game) etc. They can give idea of different shapes like horizontal, vertical, diagonal, circle, circumscribing circle, concurrent, triangle etc. while playing. All in all teachers have to create a friendly environment for students. They have to bring out children from the four walls of a narrow class room. Students must be allowed to observe their surroundings. They should be allowed to identify the different shapes of outer world. Once they started identifying the different shapes correctly, they won't forget the lesson. Once the little students start feeling at ease in doing sums then it means they are fallen in love with Mathematics.

Conclusion:

We can conclude the above discussion with the view accorded by a Russian psychologist, Lev Semenvoich Vygotsky. He accorded a theory of inter and intra psychological phenomenon (Cordon 2005:257). According to his view children do not observe only. They scan the observed things in solitude. Therefore, teachers and parents should be cautious about their own behaviour. They should pay heed to their children's query on any mathematical issue. Often parents feel reluctant to solve the sum of their children. It often appears that parents teach other subjects to their children, and left the mathematics subject for tutors and teachers. Children get confused. Children are keen observant. Therefore, things related to them must be transparent. Parents have to capable enough to address their mathematical problems. They have also the burden of responsibility to create positive vibes about the subject. Hence, parents and teachers equal participation is needed to shift a drilling subject i.e. Mathematics into an entertaining one.

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