Educational Administration: Theory and Practice
2022, 28(3), 437-441
ISSN: 2148-2403
https://kuey.net/

Research Article

"Reclaiming The Joy Of Mathematics: Uncovering The Roots Of Math Phobia In School Children"

Dr. Abu Taher Mollah*

*Assistant Professor, Department of Mathematics, Pramathesh Barua College, Gauripur, Dist. Dhubri, Assam, India

Citation: Dr. Abu Taher Mollah (2022). "Reclaiming The Joy Of Mathematics: Uncovering The Roots Of Math Phobia In School Children", *Educational Administration: Theory and Practice*, 28(3) 437-441
Doi: 10.53555/kuey.v28i03.9385

ARTICLE INFO

ABSTRACT

Mathematics is an integral part of our daily lives, from basic counting and calculation to complex problem-solving. However, many school-going children develop a fear of mathematics, perceiving it as a daunting and incomprehensible subject. This phenomenon is paradoxical, given that children often acquire basic mathematical concepts through every day experiences and folk traditions. This paper explores the reasons behind math phobia in school children and identifies potential strategies to make mathematics an engaging and accessible subject. Drawing on first hand experiences and secondary sources, this study aims to bridge the gap between the natural, intuitive understanding of mathematics and the formal, academic approach that often leads to math anxiety.

Keywords: Math phobia, Math education, School children, Math anxiety, Informal learning, Folk traditions.

Introduction:

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.

Methodology:

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.

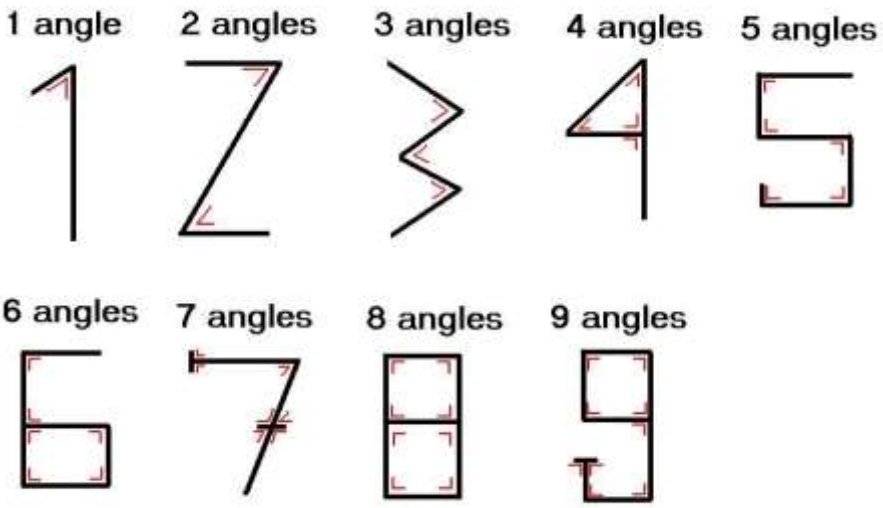
Discussion:

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 powerful language that can describe the vast expanse of the galaxy. With its unique alphabet of numbers, calculations, and equations, mathematics can succinctly summarize complex phenomena. Despite its importance, many people develop a fear of mathematics, often rooted in their school experiences. This math phobia can persist, making it essential to create a math-friendly environment that fosters growth and understanding. Just as children develop a love for literature through storytelling and rhymes, they can also develop a affinity for mathematics through engaging activities. Parents play a vital role in this process. By introducing numerical games, toys, and puzzles, parents can make mathematics a fun and interactive experience. Simple activities like counting, addition, and subtraction can be transformed into enjoyable games, laying the foundation for a lifelong appreciation of mathematics.
Here are some engaging shapes that can help children recognize and identify numerals:



Teachers can teach children some funny ways to remember tables. Children will enjoy finding the table of 7 as follows:

Table 1

0	1	2
2 (Repeated)	3	4
4 (Repeated)	5	6

Table 2

07	14	21
28	35	42
49	56	63

In table 1, First write the digits 0, 1, 2,3 4, 5,6 in 1st, 2nd & 3rd row respectively. In table 2, fill with the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 from top of the 3rd, 2nd & 1st column respectively. Then we will get the table of 7.
One can also remember the table of 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	1st Step ↓	2nd 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

Another way of remembering table of 9:
Here's a popular finger technique for remembering the table of 9:
Step 1: Hold Up All 10 Fingers
Hold up all 10 fingers in front of you.
Step 2: Fold Down Fingers for Multiplication
To calculate 9 x n, fold down the finger corresponding to the multiplier (n). For example, to calculate 9 x 4, fold down your 4th finger.
Step 3: Count Fingers on Either Side
Count the number of fingers to the left and right of the folded finger. The number of fingers to the left represents the tens digit, and the number of fingers to the right represents the ones digit.
Example: 9 x 4
If you fold down your 4th finger, you'll have 3 fingers to the left and 6 fingers to the right, representing 36 (3 x 10 + 6).
An interesting example i.e fun of fractional operation:
An old man left a legacy of 17 no. of camels for his three sons according to the fractional ratio ½ : 1/3 : 1/9 respectively. But when the three sons wanted to distribute the 17 camels among themselves they became puzzled to divide the 17. So, they went to a 'Kazi'. The 'Kazi' ordered one of his disciples to bring a camel from his own house. Accordingly, a camel was brought and added to the 17 and thus the total number of camel became 17+1=18. The 'Kazi' distributed the camels as follows-

The 1st son's share of camel= 18x1/2=9
The 2nd Son's share of camel=18x1/3=6
The 3rd Son's share of camel=18x1/9=2

Total= 17

The added camel was left and that was taken by the Kazi to his home.

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. 8 9
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:

```
  8 9
-1 7
_____
= 7 2
```

A again asks B to tell him any of the digit from the number 72. If B tells 2 then A easily replies what is second digit of the number 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 x 19 x 39 = 191919
The age of the person occurs three times.

Teachers can also show one more tricky multiplication as follows:

1x1	= 1
11x11	= 121
111x111	= 12321
1111x1111	= 1234321
11111 x 11111	= 123454321
111111 x 111111	= 12345654321
1111111 x 1111111	= 1234567654321
11111111 x 11111111	= 123456787654321
111111111 x 111111111	= 12345678987654321

The multiplication of elevens is drilling one. But one can multiply elevens easily. One has to place digits in descending and ascending order as shown above to multiply so many equal numbers of elevens. 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:

In conclusion, reclaiming the joy of mathematics in school children necessitates a collaborative effort from parents and teachers. As Lev Vygotsky's theory suggests, children are active observers who learn through social interactions. Therefore, it is crucial for parents and teachers to model positive attitudes towards mathematics and address children's queries with enthusiasm. By sharing the responsibility of fostering a love for mathematics, parents and teachers can transform the subject from a daunting task to an engaging and enjoyable experience. Ultimately, this synergy can help mitigate math phobia and empower children to develop a lifelong appreciation for mathematics.

References:

1. Aechibald, G.C.& Lipsey, Richard, G. (1997). *Mathematical Treatment of Economic*.AITBS Publisher: New Delhi, Print.
2. Clapham & Nicholson, Christopher & James. (2009). *Mathematics*. Oxford University Press: New York, Print.
3. Cordon, Luis A. (2005). *Popular Psychology*. Green Wood Press: London, Print.
4. Haralamos, M with Heald, R.M. (1980). *Sociology, Themes and Perspectives*. Oxford University Press: England, Print.
5. Hawking, Stephen. (1989). *A Brief History of Time*. Bantam Books: New York, Print.
6. Jenkins, Richard. (2004). *Social Identity*. Routledge Publication: London, Print.
7. Kneebone, G.T. (1963). *Mathematics Logic and Foundation of Mathematics: An Introductory Survey*. The University of California: Dover,(e-book)
8. L.D., Adams. (1900). *A Background to Primary School Mathematics*. Oxford University Press: England, (e- book).
9. LoTorre, Donald.R & others. (2011). *Calculus Concepts: An Informal Approach to the Mathematics of Change*. Cengage Learning: India, (e- book).
10. Sindhu, Kulbir Singh. (2012). *The Teaching of Mathematics*. Sterling Publisher : New Delhi, Print.
11. Ramirez, G., & Beilock, S. L. (2020). *The Relationship Between Math Anxiety and Math Achievement*. Journal of Experimental Psychology: General
12. Schoenfeld, A. H. (2020). *Mathematics for All*. Journal for Research in Mathematics Education.
13. Watson, A., & Ohtani, M. (2020**).** *Teaching Mathematics with Examples*. Routledge.
14. Zevenbergen, R. (2020). *Mathematics Education in the Margins*. Springer.
15. Ashcraft, M. H. (2022). *Math Anxiety and Basic Number Processing*. Journal of Experimental Psychology: Learning, Memory, and Cognition.