

Mathematics Anxiety among the School Students

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Abstract:

The present study described the causes of Mathematics anxiety, its' impacts on students and way-out of mitigation from Mathematics anxiety. Mathematics anxiety can be manifested as psychological, physical as well as behavioral expression. It has negative impact on performance, achievement and social development of the students. There are so many different reasons to create Mathematics anxiety such as teacher's negative attitude, un-psychological teaching methods, negative classroom experience of students, parents' unrealistic expectation and high stake test pressure. If the issue of Mathematics anxiety is not dealt with sincerely, it could have grim effect in many areas of our whole education system. In this issue teacher should most responsible and they should follow the teaching learning procedure 'concrete to abstract' and easy mathematical problem to harder. To mitigate the Mathematics anxiety the external support system is not only teachers' activities but also includes parents' attitude and peer groups.

Keywords: *Mathematics Anxiety, School Students, Mathematical Achievement, Mathematical performance*

INTRODUCTION

Mathematics is the mother of all science and the universe cannot move without mathematics. Mathematics: in concept, activities, pattern, laws are most essential in everywhere in our daily life activities from dawn to midnight. Mathematics includes from birth to death, from creation to universe and from home to society. Since, Mathematics becomes the part of daily life hence, mathematics learning has become extremely essential from in our school education that is from childhood. With the increasing needs, demands and requirements of Mathematics, it has been placed in school to educate students and make them "Mathematically equipped" due to the adaptation of high-tech civilization (Das and Das, 2013). Through the school Mathematics, students can develop their knowledge domain, skill domain and attitude domain. But there are many difficulties in learning Mathematics in School education System. For these difficulties Mathematical Phobia or Mathematical Anxiety has been increased day to day among the school students. As per National Mathematics Advisory Plan(2008), "Mathematics, with cognitive

difficulties and high level of abstractness is a critical course for school life” (National Mathematics Advisory Plan, 2008). Consequently, it is most important for all students to be successful in Mathematics, however some pupils are facing hardship and failing in Mathematics even though they succeeded in other school subjects, one of the causes of this unexpected condition is also considered to be Mathematics anxiety in other word Mathematical phobia (Gough,1954). Anxious about Mathematics hinders to develop the students’ ability to conceptualize, inquire, reason and Mathematical communication and they cannot use Mathematics to formulate and solve the problems not only Mathematics but also their daily life, clarity of thought and pursuing assumption to logical conclusion (Teaching of Mathematics, NCERT). Different Education commission of pre and post independence of our country has recommended reducing Mathematics Anxiety. Very recent proposed New Education Policy,2016 has recommended suggestions for joyful Mathematics class and reduce Mathematics Anxiety such as Mathematics class room enrich with wide range of local collections, charts, posters, colorful encyclopedias and reference books to practices Mathematics and share the experiences. To make joyful and attractive Mathematics class, keep the Mathematics kit in class room so that they learn how to use those, clean up and maintains (Proposed New Education Policy, 2016).

CONCEPT OF MATHEMATICS ANXIETY

One of the biggest obstructions in mathematical teaching learning process is Mathematics Anxiety. Mathematics Anxiety has been defined as feelings of tension and anxiety which interfere with the manipulation of numbers and solving Mathematical problems in open variety of social life and academic situation. Mathematics Anxiety defines as Psychological feelings of tension (Richardson and Suinn, 1972). As the opinion of Buxton (1981), "Some students would even go so far to say that the panic about mathematics. Panic can be seen as turbulences in the mind, a kind of mental frenzy. The mind may also freeze and the students may experience physical tension" (Buxton, 1981). It has been determined that two third of adults feel loathe and dread about Mathematics (Funner and Duffy, 2002). As per D'Ailly and Bergering (1992), it was indicated as a fear and apprehension. Mathematics Anxiety considered a fear or phobia, dread which produce negative response specific to the Mathematics learning, Mathematics solving and mathematical activities that interferes with performance (Whyte, 2009). Mathematics Anxiety has been defined by Tobias and Weissbord (1980), as a panic, helpless, paralysis and mental disorganization among the students that appears at the time of solving the mathematical problem (Fiore, 1999). The formation of Mathematics Anxiety typically refers to the emotional and mental agony that occurs in some students while attempting to understand Mathematics (Wu, Amin, Malcarne and Menon, 2012). Mathematics Anxiety as a psychological; structure interferes in developing students’ ability of thinking skill, it can be considered as a significantly important factor of low level of problem solving skills of the school students in Mathematics (Das and Das, 2012). Jain and Downson (2009), define Mathematics anxiety as low self confidence, fear, a negative mind set, less interest to manipulation of numbers and the solving the mathematical problem (Jain and Dowson, 2009).

SYMPTOMS OF MATHEMATICS ANXIETY

Mathematics anxiety can be manifested with some symptomatic characters by which we can identify that the children are suffering from Mathematics Anxiety. There are physical, psychological and behavioral symptomatic characters. In physical symptoms, it is associated with the increasing of heart beat, clammy hands, appears light headedness and upset stomach. In psychological symptoms, it is associated with inability to provide concentration in Mathematics class, students feel helpless, and feeling of disgrace and worry. In Behavioral symptoms, it is united with avoidance of Mathematics classes, students' disfavor the Mathematics home work until the last moment and irregular study (Plaisance, 2009; Jackson, 2008; Woodard, 2004). Mathematics anxiety starts off at different ages for different people, like that some students may involve with it as early as third or fourth grade (Jackson and Leffingwell, 1999). Again as per Perina (2002), the problem of Mathematics anxiety is thought to occur in middle school (Perina, 2002). A student with Mathematics anxiety may have a bad attitude about Mathematics before attempting the problem or even before the teachers explain the problem. Mathematics anxious students may be nervous and unable to sit till in Mathematics class. Mathematics anxious students may dread to attend in Mathematics class and fill greater fear of answering a teacher's question incorrectly in Mathematics class rather than other class (Hsiu-Zu, 2000). Mathematics Anxious students may feel embarrassed, frustrated, irritated and fearful (Buxton, 1981). Negative attitude about Mathematics can be expressed with facial expression, body language and other indicators. A student with Mathematics anxiety severely hinders his or her working memory (Perina, 2002). Mathematics Anxious student feels difficulty to solve a problem with long division as a reason he is unable to focus solely on performing the calculations, and also has to deal with negative thought towards Mathematics. Mathematics anxiety is not limited only the school subject but also it is inclined to that he has test and social anxiety as well (Perina, 2002).

IMPACT OF MATHEMATICS ANXIETY ON PERFORMANCE, ACHIEVEMENT AND SOCIAL DEVELOPMENT

According to the research findings of several researchers, Mathematics anxiety is negatively correlated with the performance and achievement in mathematics and if this issue among the students is not mitigated with properly, it could have a grim effect in many arena of our education system (Das and Das, 2013). A study of Fennema and Sherma (1976), with their Mathematics attitude scale (MAS) finds Mathematics anxiety and Mathematics ability is highly negative correlated in their sample of secondary school students. In behavioral studies of adults conducted by Ashcraft and Red (2005), and Malon, Risko and Fugelsang (2010), showed that Mathematics anxiety causes a negative impact on basis of numerical operation. Therefore it can be stated that Mathematics anxiety has lifelong negative effect on mathematical development as well as social development. As per the

extensive research of Hembree (1990), on correlation between Mathematics anxiety and students' performance in Mathematics, it can be concluded that a major factor for the students' poor performance in Mathematics. If the problem is not over powered sincerely, maneuvered properly and effectively by teachers, parents, students themselves, school authorities and policymaker involved them it could have a acute sequence for the whole education system and entire performance of the students' (Hembree, 1990). On another study of Karimi and Venkatesan (2009), it reveals that the students who have high level of Mathematics anxiety tended to perform fewer score in Mathematics performance and those who have low level of Mathematics anxiety tended to perform high score in Mathematics (Karimi and Venkatesan, 2009) . Mathematics anxiety is not only limited to the performance of school subject but also it is included to increase the social anxiety (Perina, 2002).

CAUSES OF MATHEMATICS ANXIETY

There are many causes for Mathematics anxiety among the school students'. Mathematics anxiety is caused by poor test result, negative classroom experience, lack of eagerness to complete difficult assignment, negative attitude towards the Mathematics learning among the parents and even teachers. The anxiety about Mathematics of parents and teachers pass to their children and students (Furner and Duffy, 2002). It becomes very difficult for students' to like Mathematics when their parents already disliked and did not do well in Mathematics themselves as well as they do not think that it is important (Smith,2004). In the study conducted by Newstead (1995), the most possible causes of Mathematics anxiety include teacher's anxiety, societal factors, educational and environmental factors, classroom experience, innate cognition of Mathematics, failure in school achievement test and class room punishment (Newstead,1995). In school, assessment and evaluation system mainly high-stakes test can increase the tendency to develop negative attitude to the students' mind about Mathematics and enlarged the area of Mathematics anxiety (Scarpello, 2007). It is harder to learn Mathematics to the students due to lack of conceptual understanding the mathematical situation with computation skills. The real examples, memorized by writing rules and manipulation of symbols with little are harder to learn Mathematics rather than an integrated conceptual understanding structure (Skemp, 1986). The result of test examination among the school students' can increase the tendency towards the Mathematics anxiety (Schoenfeld, 1988). Sometimes teacher provokes his students to dislike Mathematics. The Mathematics weakness has been perceived by the teacher but he is unwilling to give extra help to the students to solve the handedness. But the teacher may angry or upset when his teaching doesn't understand by his students, although his expectation has unrealistic from his students' and specially emphasis to covering the text book (Furner and Duffy, 2002). In Mathematics class the teacher need to be creative in his teaching learning process (Pyne, Bates and Turner, 1995) but focuses the teaching approach of 'explain practice memorized' (Steele & Alfred, 1998) which grow up the Mathematics anxiety among the students. Sometimes the teacher can discourage the willingness to know about Mathematics of students and teacher dislike to give answer to the students' asking questions which are a sign of desire of learning (Jackson and Leffingwell, 1999).

MITIGATION OF MATHEMATICS ANXIETY

To mitigate Mathematics anxiety among the school students' one of the best factor is activity of teacher. The teacher must always believe that there is sufficient capability of his students to learn the Mathematics. The motivation for learning Mathematics to students may prolong by the teacher. It has been observed that students tend to assimilate their instructor's interest and enthusiasm for teaching Mathematics. With the proper motivation of teacher, Mathematics anxiety among the school students' must be reduced. Teacher should give specific example and application with basic mathematical skill of students to reduce the mathematical abstractness. The learning process 'concrete to abstract' for Mathematics learning must be followed by the teacher as a cause of learning Mathematics depending on the basic building block process. Each step builds on the previous others (Smith, 2004). Teacher should represent the example in the aspect of real daily life. It is indispensable when teaching Mathematics that the teacher progress from simple problem to complex problem (Schwartz, 2000) and it can be mitigated the Mathematics anxiety. Teacher should provide sufficient support to student with real life example and Mathematics as a fun.

To minimize or stop the Mathematics anxiety among the students external support system of not only the teacher but also the parents, peer group of school is mandatory (Schwartz,2000). For this, parents and teacher should arrange the environment of co-operative learning and 'learning by doing' which mitigate the Mathematics anxiety. The Mathematics teacher can use to help compress Mathematics anxiety, and even fully stop it before it starts, is to incorporate writing in the Mathematics curriculum (Funny and Duffy, 2002). Teacher should provide a wide space to the student by which student could explain how to do the sum instead of actually doing Mathematics problem.

Alternate forms of assessment may reduce Mathematics anxiety (Funny and Duffy, 2002). Group study that is doing Mathematics in group can also successfully mitigate the Mathematics anxiety (Prescott, 2001). Constructive self task thinking has to construct among the student through teacher (Tobias, 1978). The teacher should provide wide space to the students' to think critically, share their thinking process, and justify their answers out loud or in writing form (Funner and Duffy, 2002). It is important that teacher emphasize the process instead of right or wrong process, even though correct answers are important whereas critical thinking is more important (Schwartz, 2000). Flexibility and real aspect instead of rigidity and abstractness in Mathematics class can help facilitate cooperation, reduce stress and create positive attitudes (Steele and Alfred, 1998). The teacher should control behavior not thought (Buxton, 1981) and fully avoid any type of punishment. One another way to help students to construct more confidence in Mathematics is to post a Right of Mathematics learning in class room such as "I have the right to learn at my own space and not feel put down or stupid if I'm slower than someone else," "I have the right to ask whatever questions I have," "I have the right to feel good about myself regardless of my ability in math" (Tobias, 1978).

CONCLUSION

Mathematics is not only mother of science but also it is essential in everywhere in our daily life activities from dawn to midnight. Mathematics Anxiety is a real burning problem in worldwide. Not only students but also teachers and parents have been suffering due to Mathematics anxiety. If this burning issue is not dealt with sincerely, it could have grim effect in many areas of our education system. However, there are several real methods by which teachers and parents can help students to reduce or completely overcome from the Mathematics anxiety. To mitigate Mathematics anxiety teacher's activities plays vital role and teacher should develop his teaching strategies that highly Mathematics anxious student (Wooddard, 2004). The more research has been done, the more students, teachers and parents will be able to work together.

Future research in this field could focus on cause and prevention of Mathematics anxiety. It would help students, teachers, parents in a simple all components of our education system. The ultimatum goal of research on Mathematics anxiety should prevent creating Mathematics anxiety in students.

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