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Mathematical Anxiety among Secondary School Students CBSE of Hyderabad with Respect to Gender

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Abstract: ***The present study is an attempt to examine "Mathematical Anxiety Among Secondary School Students CBSE of Hyderabad with respect to Gender". For this purpose, sample of 100 students (50 boys and 50 girls) of class 9th of secondary schools (CBSE) in Hyderabad are approached. The data is collected by administering the Mathematical Anxiety Rating Scale-Revised prepared by Barbara S. Plake and Clair S. Parker (1982) and is further analyzes with the help of SPSS software ver.23. For data analysis, the significance of the test is calculated using t-test of correlation for the level of significance at 0.005. The finding of the study reveals there is no significant difference among boys and girls of CBSE at secondary school level. Role of gender is found on the variables examined. Applying the findings, the educational implications are further discussed by the researcher.***

Keywords: Mathematics, anxiety, mathematical anxiety, gender.

I. INTRODUCTION

Mathematics is important in everyday life in many forms and anxiety plays a major role in learning mathematics. Mathematical anxiety has a lot of different roots. Math anxiety began long before it was ever studied. Some students have had anxiety about mathematical tasks because of their performance. However, there are many different things that can cause the anxiety. Math anxiety can be measured using different scales which can help teachers effectually teach the students. There is a large impact from gender, culture, and beliefs. Math in schools has evolved tremendously over the years, and hopefully will continue to. There are many causes to the anxiety, such as home life, testing, and teachers. However, there are also many solutions such as time management, skills, and IEP

A. Mathematical anxiety

According to the research found at the University of Chicago by Sian Beilock and her group, math anxiety is not simply about being bad at math. After using brain scans, scholars confirmed that the anticipation or the thought of solving math actually causes math anxiety. Causes of mathematical anxiety are difficulty in solving problems, lack of basics in mathematics, lack of efficient teachers etc.

B. Need and Importance

We cannot underestimate the importance of mathematics in everyday life. We use mathematical concepts and the skills that we gain from learning mathematics in our lives daily even without realizing it. Mathematical laws govern everything around us and you can encounter significant challenges in life if you have a poor understanding of this subject. Mathematics is important in everyday life in many forms of employment, in the medical field, the economy, the environment, in science and technology, and in public decision making. Mathematics provide students with a uniquely potent set of tools to understand and change the world, these tools include problem solving skills, logical reasoning, and the ability to think critically. One of the importance of mathematics is that you can apply it in almost all careers in life. Both scientists and mathematicians rely on the principles of math to carry out their routine tasks like testing hypothesis. Scientific careers and many freelance jobs heavily use math, but these are not the only jobs that use mathematical skills. Even running a cash register requires the use of basic arithmetic. There is so much that you can do with a PhD math education. If you are working in a factory, you need mental arithmetic to track the assembly parts and even manipulate fabrication software using geometric properties to build new products. All jobs need math skills as you need to learn to balance your budget and interpret your pay check.

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II. SIGNIFICANCE OF THE STUDY

The Present study is taken up by the researcher to know whether there lies any gender difference, among students of CBSE Secondary schools, Hyderabad city, in the Mathematical Anxiety or not? If there are gender differences then what does it mean and what are the possible measures that can be taken up by the education stakeholders to lessen the gender gap and if there are no gender differences then what appropriate strategies can be applied in teaching-learning processes to make learning more convenient and productive for the learners.

III. LITERATURE REVIEW OF MATHEMATICAL ANXIETY CONCERNING GENDER

Escarez, Y.D. & Ching, Delon A. (2022) conducted a study on "Math Anxiety and Mathematical Representations of Grade 7 Students" and found that students have high level of anxiety towards mathematics. Varun Kumar and Nimisha Srivastava (2021) is another study carried out to investigation on Mathematics Anxiety of Secondary School Students and found that there is no significant difference in Mathematics Anxiety of students with respect to their gender, school board, father's qualification and with respect to their types of family. Suren, N., & Kandemir, M. A. (2020) conducted the research study on "The effects of mathematics anxiety and motivation on students' mathematics achievement and fond the results of the study, the mathematics anxiety and motivation levels of middle school eighth-grade students were high and there was a positive and moderate relationship between mathematics anxiety and motivation towards mathematics. It was also determined that anxiety predicted achievement at a higher level, followed by motivation.

IV. THE OBJECTIVE OF THE STUDY

To study the mathematical anxiety among CBSE students of secondary school of Hyderabad with respect to gender.

V. THE HYPOTHESIS OF THE STUDY

There is no statistically significant difference between boys and girls of CBSE secondary school with respect to mathematical anxiety.

VI. CONCEPTUAL FRAMEWORK

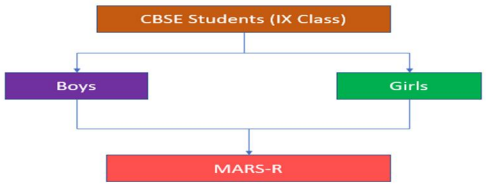

Fig 1: Conceptual framework of Mathematical Anxiety with respect to CBSE (IX class) students of Hyderabad.

The present study is essentially concerned with the CBSE students of Hyderabad city. It attempts to study whether the IX class students of CBSE i.e., boys and girls have the same levels of Mathematical Anxiety or are there any significant differences between the said independent groups. For this purpose, the Mathematical Anxiety Rating scale-R (MARS-R) is used by the researchers, which is prepared by Barbara S. Plake and Clair S. Parker (1982). The collected responses are further estimated to make inferences about MARS-R concerning gender.

A. Material And Methods

The present work is a comparative study as it endeavors to compare two independent groups that are boys and girls who are pursuing IX class. These groups are compared concerning the construct mathematical anxiety, which means the researchers will try to analyze whether boys have a more mathematical anxiety or girls or vice versa? Or there is no such difference existing in the groups at all.

1) *Population and Sample:* All the IX class students of Hyderabad, G.H.M.C. limits are considered the population for the present work. However, the sample of the present study is the 100 students (50 boys and 50 girls) of CBSE schools, Hyderabad, Telangana.

2) *Data and Sources of Data:* The primary data is collected from the IX class students of CBSE schools. The secondary data is collected from offline source that include which is cited in the reference section. *Tool for measurement:* The tool used is MATHEMATICS ANXIETY RATING SCALE—REVISED (MARS-R). This 24-item instrument is designed to measure anxiety related to involvement in statistics and mathematic courses. Mathematical Anxiety Rating Scale is a self-report questionnaire prepared by Barbara S. Plake and Clair S. Parker (1982). The tool comprises of a 5-point Likert scale: Definitely choose 1=Low anxiety, 2=Some anxiety, 3=Moderate anxiety, 4=Quite a bit of anxiety and 5=High anxiety, containing twenty-four items each measuring the said construct. Every item comprises of five statements, from which the respondents were supposed to choose either of the statement by opting any one alternative provided in the Likert scale.
3) *Reliability and Validity of the Tool:* The tool has shown evidence of validity as well as reliability in Barbara S. Plake and Clair S. Parker (1982) studies. The reported reliability of the tool ranges between 0.68 to 0.85 and concurrent validity is calculated and confirmed by the researchers with the help of a motivation strategy learning questionnaire. Scoring of the Tool: The scores are calculated by summing up the scores of all the items and average is taken out by dividing the added score with the number of items. The scores of the scale possibly range between 1 to 5, which signifies the higher the scores the greater is the mathematical anxiety.

VII. STATISTICAL ANALYSIS

Descriptive Statics is used to find out the mean, standard deviation, and standard error of the overall sample of the study. Under inferential statistics, an independent sample t-test is calculated using SPSS Software Ver. 23 to find out the significant difference between boys and girls concerning MARS-R at α 0.05 level.

Table 1: Descriptive statistics of mathematical anxiety in terms of gender:

Descriptive Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
MARS-R	Boys	50	73	16.197	3.238
	Girls	50	67	16.197	3.238

Table 1 shows the means, standard deviation, and standard error of the sample with respect to MARS-R.

Table 1 shows the calculated mean, standard deviation and standard error of secondary school students with respect to gender. CBSE boys estimated mean=73, SD=16.197 and SE=3.238 whereas CBSE girls estimated mean=67, SD=16.197 and SE=3.238. the table makes it apparent that there is variation between the means of CBSE boys and girls, and there is no variation between the scores of standard deviation and standard error concerning the said group.

Table: 2 Inferential statistics of mathematical anxiety concerning gender:

	n	Group Mean	SD	SD ERROR	DF	α VALUE	T CAL	T CRI	Significance
CBSE BOYS	50	73	16.197	3.238	98	0.05	1.852	1.984	H0: ACCEPTED
CBSE GIRLS	50	67	16.197	3.238	98	0.05	1.852	1.984	

Table 2 shows the calculated t-value and α -value of MARS-R.

Table 2: There is no significant difference between boys and girls of CBSE secondary school students with respect to mathematical anxiety. The T calculated value is 1.852. The α-Value is 0.05. The result is not significant at α-value = 0.05. hence the null hypothesis is accepted i.e., there is no significant difference between boys and girls of CBSE secondary school students with respect to mathematical anxiety. The mathematical anxiety level is more in CBSE board boys when compared to CBSE board girls the group mean CBSE boys is greater than the CBSE girls.

Interpretation: There is no significant difference between boys and girls of CBSE secondary school students with respect to mathematical anxiety as the calculated t ratio is less than the critical value for n=50, df=98, & α=0.05.

VIII. CONCLUSION AND DISCUSSION

The present piece of work is found to be not statistically significant with respect to gender. It can be concluded from the analysis that boys possess greater levels of mathematical anxiety than their counterpart girls as the calculated mean score of boys is higher than the calculated mean score of girls, which indicate that educational stakeholders, at the time of teaching-learning processes, must try to equip different teaching-learning strategies with respect to gender (especially in case of girls as they found to have less mathematical anxiety) that best attracts their attention and keep them motivated in academics throughout the year. Educators, on one hand, can plan the appropriate activities for the girl-students that must not only make them realize the importance of mathematics but also help them to cope with lower levels of mathematical anxiety. On the other hand, as boys are already found motivated towards mathematical anxiety, they can additionally be exposed to varied teaching-learning processes that will ignite as well as enhance their higher-order thinking abilities, which can perhaps make them apply their knowledge more practically in future. This practice can, nevertheless, be simultaneously applied to girls also. Apart from this, different ways can be adopted by the educational community to know the reasons behind the lack of mathematical anxiety in girls and if possible, can work accordingly to best meet the disparity. The eradication of this disproportion in the mathematical anxiety can result in the gradual acknowledgement of female students in the beauty of acquisition and application of knowledge that may magnify their capabilities as a mathematician, which will hopefully assist them in sustaining their life as well as the life of their immediate surroundings fruitfully.

IX. ACKNOWLEDGMENT

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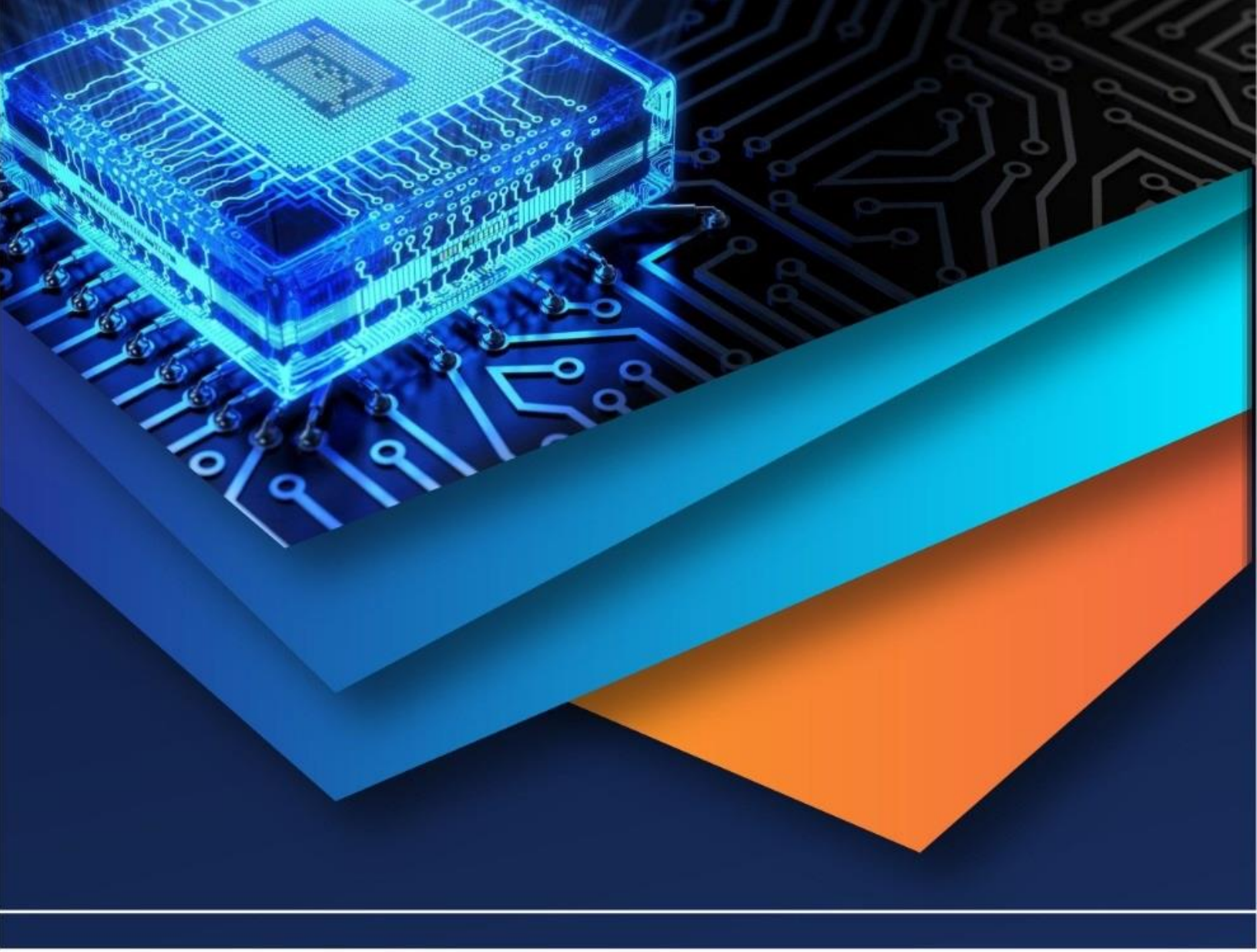

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