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Analysing mathematical attitude of students

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Abstract
This study was undertaken to examiner the mathematical attitude of secondary school students. The researcher selected tie 200 students with due representation of the gender. The researcher selected the Attitude towards Mathematics scale developed by Dr. S.C. Gakhar and Rajani. The data has been analysed with the help of suitable statistical treatment. Descriptive and comparative analysis was used for processing the data. In context to same, the researcher found that male students were found more favourable attitude towards mathematics as compared to female students on all the dimensions viz. wider applicability, development of skills, reasoning, objectivity, intellectual development, non-intellectual development, individual outlook and universal outlook. Thus, impact of gender was found significant on the mathematical attitude of students.

Keywords: mathematical attitude, secondary school students

Introduction
Research on attitudes toward mathematics has a long tradition in mathematics education and developed a range of perspectives and methodologies that deals with the construct of attitudes. In promoting mathematics, educators are eager to find out the factors that affect mathematics achievement among students. A number of instruments to measure mathematics attitudes have been developed in the past. Attitude towards mathematics has been defined by researchers and thinkers in numerous ways and there is no exact definition of it (Rajyaguru, Mahesh. 2014) [16] says it is a liking or disliking of mathematics, a tendency to engage in or avoid mathematical activities, a belief that one is good or bad at mathematics, and a belief that mathematics is useful or useless. According to some point of view the attitude toward mathematics is just a positive or negative emotional disposition towards mathematics Rai, Dona and P.K. Gupta (2014) [15] defines attitude towards mathematics as the behaviours of students, like giving priority for mathematics homework and studying, like continuing with the lessons at home that was taught in school. According to Mandler's discrepancy theory (1989) a negative attitude is a result of frequent failures or interruptions of planned actions, which were intended to face mathematical tasks. This theory was supported in a study done by Prendergast, M. & O 'Donoghue, J. (2014) [14] they further added that these negative attitudes may become relatively permanent. An important aim of mathematics education is to develop in students positive attitudes towards mathematics. The notion of having a positive attitude towards mathematics encompasses both liking mathematics and feeling good about one's own capacity to deal with situations in which mathematics is involved. Thus, by learning mathematics student can also develop positive attitude towards this subject. Hence, learning of mathematics and students' performance in mathematics has an undeniable significance in academics. Positive attitude can be considered as the main cause in learning and perceiving mathematics and acquiring good grades in exam. Similarly, unfavourable attitude towards the subject may cause failure in the subject. Attitude of students towards mathematics may differ in boys and girls and so their achievement. Secondary level students might not have similar attitude towards mathematics to that of students of junior level and higher secondary level. Attitude of student toward any subject is supported or hampered by other factors too viz. school and home environment, teacher's attitude and beliefs, complexity in contents, teaching strategies, parental attitudes, parents' education, students' belief in mathematics etc.

Research problem: The statement of the research problem for the present study is as under:

Operational definitions of the terms and variable

The operationalization of the terms and variables used in the presents are itemized as under:

- **Mathematical attitude:** Attitude towards mathematics has been defined by researchers and thinkers in numerous ways and there is no exact definition of it (Chopra, S.L (1986) [8] says it is a liking or disliking of mathematics, a tendency to engage in or avoid mathematical activities, a belief that one is good or bad at mathematics, and a belief that mathematics is useful or useless. In the present study it refers the set of score obtained by the respondents on mathematical attitude scale developed by S.C. Ghakar.
- **Students:** Students in the present study refer those secondary school students who are reading in class 11th in selected higher secondary schools of Anantnag District.

Objectives of the study

The present study consists of below mentioned objectives:

Analysing mathematical attitude of students

1) To explore the mathematical attitude among male and female secondary school students on below mentioned dimensions:

- Wider applicability
- Development of skills
- Reasoning
- Objectivity
- Intellectual development
- Non-intellectual development
- Individual outlook
- Universal outlook

Hypothesis

Based on richness background of the knowledge, the investigator speculated the below mentioned research hypothesis:

2) To explore the mathematical attitude among male and female secondary school students on below mentioned dimensions:

- Wider applicability
- Development of skills
- Reasoning
- Objectivity
- Intellectual development
- Non-intellectual development
- Individual outlook
- Universal outlook

Delimitations of the study

During the whole research process lot or constraints were faced by the investigator. However, investigator made ample efforts to delimit these constraints upto maximum extent. Consequents the research delimited the present study to following domains:

- The presents study has been delimited to 200 students.
- The present study has been delimited to Anantnag district of union territory of Jammu and Kashmir.

Methodology

The methodology of the study has been stated in the following sub-headings:

Design of the study

The present study has been operated through descriptive survey method. Further, design if the study is based on below mentioned parameters.

- **Sampling procedure:** The researcher selected tie 200 students with due representation of the gender.
- **Researcher instrument:** The researcher selected the Attitude towards Mathematics scale developed by Dr. S. C. Gakhar and Rajani.

Analysis of the data

The data has been analysed with the help of suitable statistical treatment. Descriptive and comparative analysis was used for processing the data. The detailed description of the statistical treatment is given as under:

Table 1: Showing the descriptive analysis of the Male and Female Students on Their Mathematical Attitude. (N=100 Each)

Descriptive analysis							
	N	Range	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Male Students	100	61.00	96.00	157.00	131.3300	1.18442	11.84415
Female Students	100	84.00	81.00	165.00	109.8000	1.47038	14.70381

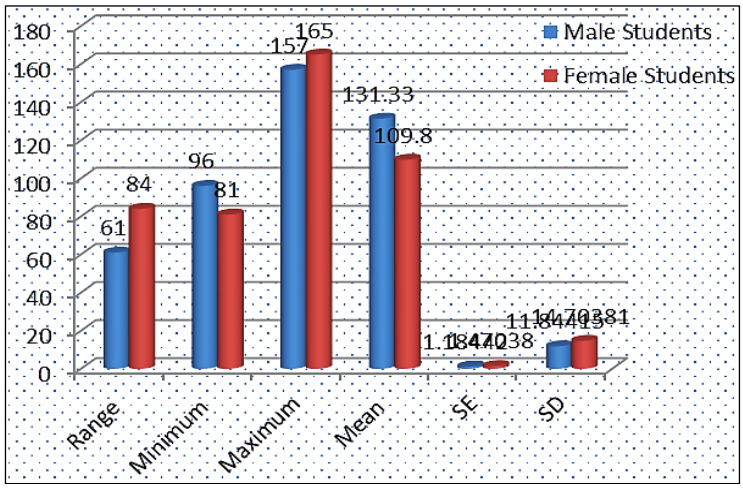

Fig 1: Showing the graphical representation of on the descriptive analysis Of the Male and Female Students on Their Mathematical Attitude. (N=100 Each)

Interpretation

The results reported in above mentioned table gives information about the descriptive analysis of the male and female students on their mathematical attitude. The results reveal that incase of male students the range was seen 61.00 and the mean was seen 109.80. Accordingly, in the same table it was found that the standard deviation of male students was seen 11.84 and the standard error mean was seen 1.18. Coming towards their female students, it was observed that 84.00 and the mean were seen 109.80. Accordingly, in the same table it was found that the standard deviation of male students was seen 14.70 and the standard error mean was seen 1.47.

Table 2: Showing the mean significant difference between male and female students on their composite score of mathematical attitude. (N=100 each)

Variable	Male students		Female students		't' value
	Mean	SD	Mean	SD	11.43@
Mathematical attitude	131.33	11.84	109.80	14.70	
Significant at 0.1 level of confidence					

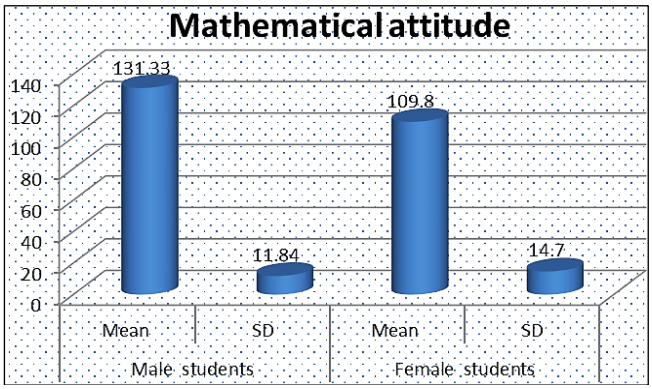

Fig 2: Showing the graphical representation on mean significant difference between male and female students on their composite sore of mathematical attitude. (N=100 each)

Interpretation: The perusal of the above reported (Please refer table 2 Fig. 2) gives information about the mean significant difference between male and female students on their mathematical attitude. The results reveal that the mean value of male students was seen 131.33 whereas the mean value of female students was seen 8.53. In pursuance to same, the researcher found that the mean value of male students was reported higher as compared to female students. The collocated 't' value was seen 11.43, which is higher than table value at 0.01 level of confidence. Thus, male students were seen with high level of mean achievers at this dimension. Accordingly, the researcher can reveal that the impact of gender is significant on composite score of mathematical attitude.

Keeping the above discussion under consideration, the researcher found that there seems significant difference between male and female students on their mathematical attitude male students were seen more favourable attitude towards mathematics as compared to female students. Accordingly the status of eth hypothesis is reported as under:

Hypothesis: There seems no significant difference between male and female students on their mathematical attitude.

……Status: ……Rejected.

Conclusions of the study

In context to same, the researcher found that male students were found more favourable attitude towards mathematics as compared to female students on all the dimensions viz. wider applicability, development of skills, reasoning, objectivity, intellectual development, non-intellectual development, individual outlook and universal outlook. Thus, impact of gender was found significant on the mathematical attitude of students.

Conflict of interest: The researcher declare that there is no any conflict of interest.

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