



Gender Differences in the Attitude towards Mathematics of Ninth Class Adolescents of Chandigarh

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Abstract:

The present study is based on a survey of secondary school students about their attitudes towards mathematics. Students of both the gender constitute the population of this study. Sample of the study comprised 464 male and 461 female ninth class students of 10 private and 10 government schools located in Chandigarh. A questionnaire prepared and standardized by the investigator to examine the attitudes of male and female students towards mathematics at secondary school level was used. Descriptive statistics and t-test with $P < 0.05$ level of significance were used for data analysis. Results show significant gender differences with regard to teachers' perception and enjoyment dimensions of attitude towards mathematics. But no significant differences have been found with regard to self confidence, motivation, usefulness dimensions of attitude towards mathematics and total attitude towards mathematics.

Keywords: *Attitude, Enjoyment, Motivation, Self confidence, Teachers' perception, Usefulness*

1. Introduction

Attitude towards mathematics is the liking or disliking, approving or disapproving the subject, which implies a positive or negative attitude towards mathematics. Attitudes are the positive or negative feelings that an individual holds about mathematics. According to Fishbein and Ajzen (1981), "Attitudes are learnt prepositions to respond in a consistently favorable or unfavorable manner with respect to a given object. It represents covert feelings of favorability or unfavorability towards an object, person, issue or behavior". Zimbardo and Leippe (1991) define attitude as favorable or unfavorable evaluative reasons whether exhibited in beliefs, feelings, or inclinations to act towards something. According to them, attitude is commonly referred to as beliefs and feelings related to a person or event and their resulting behavior. This means that when individuals have to respond quickly to something, the feeling can guide the way they react.

Ifamuyiwa and Akinsola (2008) investigated moderating effects of locus of control and gender on senior secondary school students' attitude towards mathematics and found no significant main effects of locus of control and gender on the participants' attitude towards mathematics. Mata, Monteiro, and Peixoto (2012) examined the effects of individual, motivational, and social support factors on attitudes towards mathematics and to an understanding of the defining characteristics of these attitudes in the school environment. The results revealed that, in general, students held positive attitudes towards mathematics and also highlighted the main effects of grade and math achievement on these attitudes. No gender effect was identified although the girls showed a continuous decline in attitudes as they progressed in school. Ravanan, Mary and Julie (2013) found no significant difference in attitude towards mathematics of XI standard students in Trichy District, owing to differences in their gender, region and medium of instruction and there is significant difference in attitude towards mathematics owing to differences in their stream of study, types of school management and socio economic status.

2. Hypotheses

- Ho₁:** There is no significant difference in self confidence of male and female ninth class students towards mathematics learning.
- Ho₂:** There is no significant difference in motivation of male and female ninth class students to learn mathematics.
- Ho₃:** There is no significant difference between male and female ninth class students about the usefulness of mathematics.
- Ho₄:** There is no significant difference between male and female ninth class students about the mathematics teacher's perception.
- Ho₅:** There is no significant difference in enjoyment of mathematics learning and problem solving of male and female ninth class students.
- Ho₆:** There is no significant difference in attitude towards mathematics of ninth class male and female adolescents.

3. Method and procedure

The following methods and procedures were adopted to conduct this study.

4. Population and sample

Students of both the genders constitute the population of this study. Sample of the study comprised 464 male and 461 female 9th grade students selected randomly from 10 private and 10 government schools located in Chandigarh.

5. Instrument for the study

Attitude towards mathematics scale developed and standardized by the investigator consisting of five dimensions i.e. Self-confidence, Motivation, Usefulness, Teacher's expectations and Enjoyment was used to collect data. The reliability coefficient of the final draft was found to be .65 for self- confidence, .68 for motivation, .66 for usefulness, .41 for teacher's expectation, .29 for enjoyment and .76 for total attitude towards mathematics. All the coefficients were significant at .01 level of significance except enjoyment which is significant at 0.05 level of significance.

6. Research design

This study was descriptive in nature. Survey method was used for data collection.

7. Analysis and interpretation of data

Data were collected on the scale from 925 respondents. This data were analyzed through SPSS by applying statistical measures accordingly. The results were interpreted by comparing the means and by using the t-test at $P < 0.05$, level of significance.

Table 1 : Mean Differentials between Self confidence Dimension of Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Dimension of Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t - value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
Self-confidence	36.5366	36.1996	9.74794	9.47120	.53	NS

Table 1 represents the mean differentials between ninth class male and female adolescents with regard to self-confidence dimension of attitude towards mathematics. The mean scores of male adolescents on self-confidence dimension of attitude towards mathematics were 36.53, and that of female adolescents were 36.19 respectively. The standard deviation of scores of male adolescents on self-confidence dimension of

attitude towards mathematics were 9.74 and that of female adolescents were 9.47 respectively. The calculated t –values between male and female adolescents with regard to self-confidence dimension of attitude towards mathematics were .53., which is not significant.

On the basis of above discussion, it can be concluded that male and female students do not differ significantly with regard to self-confidence on themselves. Hence, Hypothesis 1 namely, “There is no significant difference in self confidence of male and female ninth class students towards mathematics learning” has been accepted.

Table 2: Mean Differentials between Motivation Dimension of Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Dimension of Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t -value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
Motivation	28.3966	28.3492	5.42075	5.88749	.13	NS

Table 2 represents the mean differentials between ninth class male and female adolescents with regard to motivation dimension of attitude towards mathematics. The mean scores of male adolescents on motivation dimension of attitude towards mathematics were 28.39, and that of female adolescents were 28.34 respectively. The standard deviation of scores of male adolescents on motivation dimension of attitude towards mathematics were 5.42 and that of female adolescents were 5.88 respectively. The calculated t –values between male and female adolescents with regard to motivation dimension of attitude towards mathematics were .13., which is not significant.

On the basis of above discussion, it can be concluded that male and female students do not differ significantly with regard to motivation towards mathematics learning. Hence, Hypothesis 2 namely, “There is no significant difference in motivation of male and female ninth class students to learn mathematics” has been accepted.

Table 3: Mean Differentials between Usefulness Dimension of Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Dimension of Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t -value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
Usefulness	21.5905	21.7636	3.50754	3.74840	.73	NS

Table 3 represents the mean differentials between ninth class male and female adolescents with regard to usefulness dimension of attitude towards mathematics. The mean scores of male adolescents on usefulness dimension of attitude towards mathematics were 21.59, and that of female adolescents were 21.76 respectively. The standard deviation of scores of male adolescents on usefulness dimension of attitude towards mathematics were 3.50 and that of female adolescents were 3.74 respectively. The calculated t –values between male and female adolescents with regard to usefulness dimension of attitude towards mathematics were .73., which is not significant.

On the basis of above discussion, it can be concluded that male and female students do not differ significantly with regard to usefulness mathematics in their lives. Hence, Hypothesis 3 namely, “There is no significant difference between male and female ninth class students about the usefulness of mathematics” has been accepted.

Table 4: Mean Differentials between Teacher’s Expectations Dimension of Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Dimension of Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t - value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
Teacher’s expectations	18.0065	19.3536	3.08167	3.17920	6.543	0.01

Table 4 represents the mean differentials between ninth class male and female adolescents with regard to Teacher’s expectations dimension of attitude towards mathematics. The mean scores of male adolescents on Teacher’s expectations dimension of attitude towards mathematics were 18.00, and that of female adolescents were 19.35 respectively. The standard deviation of scores of male adolescents on Teacher’s expectations dimension of attitude towards mathematics were 3.08 and that of female adolescents were 3.17 respectively. The calculated t –values between male and female adolescents with regard to Teacher’s expectations dimension of attitude towards mathematics were 6.54., which is significant at 0.01 level of significance. Higher mean score of female adolescents in teacher’s expectations dimension of attitude towards mathematics than male adolescents suggests that female adolescents believe that their teachers have faith in their ability and performance in mathematics more than male adolescents.

On the basis of above discussion, it can be concluded that female students have more firm belief in their teacher’s faith on their abilities than their male counterparts. Hence, Hypothesis 4 namely, “There is no significant difference between male and female ninth class students about the mathematics teacher’s perception” has been rejected. The above results confirm the findings of Brain, Peter and Russel (2010); Janet (2008) and Ronglien (2013) who have reported that females were more likely to hold positive attitude towards mathematics.

Table 5: Mean Differentials between Enjoyment Dimension of Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Dimensions of Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t - value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
Enjoyment	25.6293	24.9588	5.19225	4.99439	2.001	0.05

Table 5 represents the mean differentials between ninth class male and female adolescents with regard to Enjoyment dimension of attitude towards mathematics. The mean scores of male adolescents on Enjoyment dimension of attitude towards mathematics were 25.62, and that of female adolescents were 24.95 respectively. The standard deviation of scores of male adolescents on Enjoyment dimension of attitude towards mathematics were 5.19 and that of female adolescents were 4.99 respectively. The calculated t –values between male and female adolescents with regard to Enjoyment dimension of attitude towards mathematics were 2.00, which is significant at 0.05 level of significance. Higher mean score of female adolescents in Enjoyment dimension of attitude towards mathematics than male adolescents suggests that male adolescents enjoy learning of mathematics more than female adolescents.

On the basis of above discussion, it can be concluded that male adolescents enjoy learning mathematics more than females. Hence, Hypothesis 5 namely, “There is no significant difference in enjoyment of mathematics learning and problem solving of male and female ninth class students” has been rejected.

Table 6: Mean Differentials between Attitude towards Mathematics (Total) of Ninth Class Male and Female Adolescents

Attitude towards Mathematics	Mean(N=925)		SD(N=925)		t - value	Level of Significance
	Male (N=464)	Female (N=461)	Male (N=464)	Female (N=461)		
(total)	130.1595	130.6247	22.80806	22.24586	.314	NS

Table 6 represents the mean differentials between ninth class male and female adolescents with regard to total attitude towards mathematics. The mean scores of male adolescents and that of female adolescents with regard to total attitude towards mathematics were 130.15 and 130.62 respectively. The standard deviation of scores of male adolescents and that of female adolescents with regard to total attitude towards mathematics were 22.80 and 22.24 respectively. The calculated t –values between male and female adolescents with regard to total attitude towards mathematics were .314, which is not significant at any level of significance. Hence, Hypothesis 6 namely, “There is no significant difference in attitude towards mathematics of ninth class male and female adolescents” has been accepted. The above results confirm the findings of Farooq and Shah (2008) and Shrinivasan (1991). They have reported that gender differential has no impact on the attitude of students towards mathematics.

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