

GENDER DIFFERENCES IN THE PERCEPTION OF CLASSROOM ENVIRONMENT AND ATTITUDE TOWARDS MATHEMATICS OF NINTH CLASS ADOLESCENTS

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Abstract

This study was based on a survey of secondary school students' perception of their classroom environment. Students of both the gender constitute the population of this study. Sample of the study was 925 students i.e. 464 male and 461 female students of 9th grade selected randomly from 10 private and 10 government schools located in Chandigarh. Classroom environment Scale developed by Moos and Trickett (1987) and Attitude towards mathematics scale developed and standardized by investigator were used for data collection. Descriptive statistics and t-test with $P < 0.05$ level of significance were used for data analysis. No gender differences were found with regard to attitude towards mathematics.

Keywords: Perception of Classroom Environment, Attitude towards mathematics

A positive classroom environment is an essential component of teaching and learning. Classroom is a place for teaching and learning activities in the formal education system. The ambience of the classroom influences the learning process. A classroom is a warm, pleasant and cordial interactive place not only with the teachers but also with peers. It is a place where the learners can feel welcomed, valued, useful, challenged, respected and physically and psychologically safe. It is a structured, organized and efficient place for creating learning environment (Ramalingam, 2013). The classroom is a learning environment where interactions occur among students and teachers and learning takes place (Talton & Simpson, 1987). The quality of the classroom environment in schools has a considerable influence on pupils learning. That is, they learn more when they perceive the classroom atmosphere more positively. According to Standards for Teaching Mathematics (NCTM, 1991), "Creating an environment that sustains and promotes mathematical reasoning and cultivates all students' competence with, and outlook towards mathematics should be one of the teacher's main concerns. The nature of this type of environment is formed by the kinds of mathematical tasks and discussion in which students participate."

An attitude is a preparation or readiness for response. It is incipient rather than overt and consummator. It is not behavior, but the pre condition of behavior. 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, this feeling can guide the way they react. Kuppaswamy (1993) has made analysis of attitudes and reveals that they have four dimensions:

- 1) **Direction:** The direction of an attitude is either positive or negative i.e. for or against some object or values.
- 2) **Intensity:** The intensity of positive or negative attitude is the degree to which it motivates the person's behavior towards the component.
- 3) **Extension:** Extension of an attitude is the degree to which it is generalized or the number of cases it covers.
- 4) **Duration:** The duration of an attitude is a length of time it endures.

According to Ellis (1996), the attitude of a person towards mathematics or science has been defined as his attractiveness or repulsiveness to mathematics or science.

Mosley (2006) investigated the relationship between selected variables and the mathematics

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achievement of seventh grade students and teacher perceptions regarding the achievement gap between groups of students. Results revealed a significant difference in classroom grades associated with gender, SES, and school attendance. The teacher interviews indicated that high expectations from home and school influence student achievement. Wagner (2002) investigated gender differences in students' mathematics achievement and perceptions of the classroom environment in single-sex mathematics classrooms in one urban, ethnically diverse, middle school. Ethnic and achievement-level differences were also explored. Several significant gender effects were found in students' perceptions of the classroom environment. Opolot-Okurut (2005) investigated secondary school students' attitudes towards mathematics. The sample consisted of 254 (123 males and 131 females) Grade IX students in nine secondary schools in three districts of Central Uganda. The results indicate significant differences in all the attitudes variables measured between the male and female students. The students in the high-performing schools indicated higher attitudes than the students in the low-performing schools. Davis (2008) investigated the perceptions of the classroom learning environment as seen by African American students attending schools in rural southeastern United States. An analysis of variance was performed which compared the mean scores of students in relation to school model attended, gender, age, and interaction of each across the three dimension of relationship, personal growth/goal orientation, and system maintenance and change. The results of the ANOVA indicted that with the exception of gender and personal growth/goal orientation there is no significant difference when it comes to students perceptions. Opolot-Okurut (2010) studied secondary students' perceptions of mathematics classroom learning environment and their associations with their motivation towards mathematics. The results indicated a statistically significant difference in student perceptions between different school types. Student perceptions on some scales were significantly associated with student motivation. Swindell (2010) in his study, differences in the middle school classroom examining learning environments of boys

and girls from different socioeconomic backgrounds found that girls do not like science and that boys are lovers of science and this could be because of their different perceptions of their learning environment. Socioeconomic status has not been having an association with perceived learning environments. Prince (2012) examined the relationship of gender, parental education, aspirations, and mathematics achievement of students from three rural public high schools in the Southeast region of the United States. A multiple regression revealed that parental education level and gender did not predict mathematics achievement while the number of books in the home did. Murugan and Rajoo (2013) studied perceptions of students' studying in Sipitang, Sabah, Malaysia with regard to mathematics classroom environment and mathematics achievement. Findings showed the students had a moderate perception of their mathematics classroom environment. Mathematics achievement was low, with female students achieving better than males in their mathematics assessment. There was no significant difference in perception of mathematic learning environment based on gender. No significant correlations were found between mathematics classroom learning environment and mathematics achievement.

METHOD

DESIGN

A systematic procedure to collect data, which helps to test hypotheses of the study under investigation, was adopted. The method was essentially descriptive survey method.

SAMPLE

In the present study, 925, 9th class students i.e. 464 male and 461 female students selected randomly from 10 private and 10 government schools located in Chandigarh. Two -stage random sampling technique was employed.

MEASURES

Descriptive statistics and t-test with $P < 0.05$ level of significance were used for data analysis.

HYPOTHESES

- There exists significant difference in Attitude towards mathematics of ninth class male and female adolescents.
- There exists significant difference in the

perception of classroom environment by ninth class male and female adolescents.

DISCUSSION OF RESULTS

Table 1 Mean Differential between Attitude towards Mathematics of Ninth Class Male and Female Adolescents

Variable	M ₁ (N=464)	M ₂ (N=461)	SD ₁	SD ₂	t- value	Level of Significance
Attitude towards Mathematics(total)	130.15	130.62	22.80	22.64	.314	NS

Table 1 represents the mean differentials between ninth class male and female adolescents with regard to Attitude towards mathematics. The mean scores of male and female adolescents with regard to Attitude towards mathematics were 130.15 and 130.62 respectively and the standard deviation of scores of ninth class male and female adolescents with regard to Attitude towards mathematics were 22.80 and 22.64 respectively. The calculated t-value between the two groups with regard to Attitude towards mathematics was .314, which is not significant.

Entries made in Table 1 reveal that the mean differential between the mean scores in Attitude towards mathematics of ninth class male and female adolescents was not significant at any level of significance. This indicates that male and female adolescents do not differ significantly with regard to Attitude towards mathematics.

Hence, Hypothesis 1, namely, "There exists significant difference between ninth class male and female adolescents with regard to Attitude towards mathematics." has been rejected.

Table 2 Mean Differentials in the Perception of Classroom Environment by Ninth Class Male and Female Adolescents

Dimensions of Classroom Environment	M (Male) (N=464)	M (Female) (N=461)	SD (Male)	SD (Female)	t value	Level of Significance
Involvement	5.60	5.72	1.64	1.74	1.12	NS
Affiliation	6.10	6.21	1.79	1.68	.916	NS
Teacher support	5.39	5.70	1.79	1.68	2.72	0.01
Task orientation	5.45	5.75	1.71	1.68	2.66	0.01
Competition	6.21	6.58	1.82	1.63	3.24	0.01
Order and organization	5.49	5.82	1.67	1.83	2.86	0.01
Rule clarity	6.26	6.57	1.79	1.63	2.72	0.01
Teacher control	5.34	5.72	1.76	1.65	3.33	0.01
Innovation	5.55	5.31	1.85	1.72	.190	NS
Classroom environment(total)	51.43	53.64	8.76	8.33	3.91	0.01

Results entered in Table 2 show that the mean differentials between the perceptions of male and female adolescents with regard to teacher support, task orientation, competition, order and organization, rule clarity, and teacher control dimensions of classroom environment and class room environment (total) were significant at .01

level of significance Whereas the mean differentials between male and female adolescents with regard to involvement, affiliation, and innovation dimensions of classroom environment were not significant at any level of significance.

The results show that the female adolescents scored higher than male adolescents in teacher support

dimension of classroom environment. This suggests that female adolescents are supported and trusted by teachers more than male adolescents. Further, the female adolescents have higher scores on task orientation dimension of classroom environment than male adolescents. This suggests that female students lay more emphasis on completing planned activities in the classroom than male students.

The results reported in the Table 2 also reveal that female adolescents scored higher in competition dimension of classroom environment than male adolescents. This indicates that female adolescents compete with each other for grades and recognition, and work hard to achieve good grades more than the male adolescents. Further, higher mean score of female adolescents in order and organization and rule clarity dimension of classroom environment than male adolescents indicates that female adolescents behave in an orderly and polite manner and organize assignments more effectively than their male counterparts. Higher mean score of female adolescents than male adolescents in teacher control dimension of classroom environment suggests that teachers are more strict with female students than male students.

However, the mean differentials between male and female adolescents in involvement, affiliation, and innovation dimensions of classroom environment were not significant. This suggests that both male and female adolescents are equally involved and attentive in classroom activities. They equally enjoy working together and follow rules in the classrooms. Since the mean score of total classroom environment of female adolescents was higher than the mean score of male adolescents, it suggests that female adolescents perceive their classroom environment more positively than their male counterparts.

On the basis of above discussion of results, it can be concluded that female adolescents are more supported and trusted by teacher, complete beforehand activities, work harder to achieve good grades and are more organized than male adolescents. Further female adolescents think that with them teachers are more strict in the classroom than their male counterparts. However, male and female adolescents don't differ with regard to their perception of involvement, affiliation, rule clarity

and innovation dimensions of classroom environment.

Hence, Hypothesis 2, namely, "There exists significant difference in the perception of classroom environment by ninth class male and female adolescents" has been partially accepted. These findings are in line by the findings of Wagner (2002) who have reported significant gender effects in students' perceptions of the classroom environment but are contradictory to the findings by Murugan and Rajoo (2013) who have reported no significant difference in perception of mathematics learning environment based on gender.

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