EFFECT OF COOPERATIVE LEARNING ON ACADEMIC STRESS OF HIGH SCHOOL STUDENTS: A COMPARATIVE STUDY

Dr. Sarita Dahiya[*]

Sonia[**]

ABSTRACT

The present experimental study was undertaken to determine the effect of cooperative learning strategy i.e. student teams achievement division (STAD) on the academic stress among ninth grade students in relation to gender. Ninth standard students of the schools situated in Jhajjar city affiliated to Haryana Board comprised the population of the study. 64 students (32 boys and 32 girls) selected through multi-stage random sampling technique constituted the sample of the study. 64 students after equating on the basis of intelligence level & socio-economic status were equally divided among two group i.e. experimental group (E) & control group (C). Group Test of intelligence by Ahuja (2012) was used to assess the intelligence level of students. Socio-economic status scale by Kalia & Sahu (2012) was used to measure socio economic status of students. Stress inventory for school students by Singh & Rani (2011) was used to measure academic stress of students. Statistical techniques like ANOVA and t-test were used to analyze the obtained data. Cooperative learning was found more effective instructional paradigm for reducing academic stress of high school students as compared to conventional method.

Keywords : Academic Stress, Cooperative Learning Strategy, Gender

[*] **Assistant Professor- III, Department of Education, M.D.U., Rohtak, Haryana**

[**] **Senior Research Fellow, Department of Education, M.D.U., Rohtak, Haryana**

INTRODUCTION

Cooperative learning has its roots in very old history. Since time immemorial, teachers have been encouraging their students to work collectively on several occasions i.e. group projects, in group discussion, in other tasked groups. These methods of cooperative learning were usually informal, unstructured and only used on special occasions. However, during the recent years about twenty years ago, some majors developments start to take place in this specified technique. As a result of many rigorous research and practical applications by numerous teachers, effective cooperative learning methods now do exists for almost every possible instructional purpose. Now teachers are using a wide mixture of cooperative methods to achieve different targeted objectives and also using cooperative learning as prime organizing pattern for classroom teaching as a regular activity. Cooperation is an inventible aspect of life. From start to the end of life we work together with others in family, work situation, free time, and neighborhood by functioning jointly to achieve common goals. It is a well known fact that people get together to bring about objectives which could not be achieved individually. In every sphere of life our success requires cooperation among individuals. Every society is used to have groups to achieve its goals and enjoyed when groups were doing well. It is evidently clear that groups doing better than individuals, especially when task requires various skills. Many professionals in education however, ignore the various opportunities to utilize groups to increase learning and enhance success. Cooperative work does not substitute teaching method, but rather focus on the substitution of individual seatwork, learning, and drill. When appropriately planned, it is ensured that the concept is understood by each and every student in the group. The success of the group totally depends on the capability of the group members to make sure that each and every student has captured the main concept. Stress is an unavoidable aspect of life and present in all around us- at work, in our environment & in arena our daily lives. Management of stress and coping with it is becoming a great concern for psychologists, physiologists, psychiatrists or clinicians. Stress may be an ordinary, adaptive reaction to threat. The role of stress is to signal and get ready individuals to take protective measure. Most psychologists emphasize that reasonable stress motivate the individuals to obtain and having creativity, however at the same time stress may hinder individual's performance on difficult tasks (Auerbach & Grambling 1998). "Academic institutions have different work settings compared to nonacademic and therefore one would expect the difference in symptoms, causes and consequences of stress in the two set up"

(Elfering et al., 2005 & Chang and Lu, 2007). Academic stress is in the form of anxiety which comes out from schooling and education. There is always pressure to get the degree and education to every person. Academic stress is found on higher side on boarding school students.

OBJECTIVES OF THE STUDY

1. To study the main effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy on academic stress of students after experimental treatment

2. To study the main effect of gender on academic stress of students after experimental treatment

3. To study the interaction effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy and gender on academic stress of students after experimental treatment

HYPOTHESES OF THE STUDY

H_{01} There exists no significant effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy on academic stress of students after experimental treatment

H_{02} There exists no significant effect of gender on academic stress of students after experimental treatment

H_{03} There exists no significant interaction effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy and gender on academic stress of students after experimental treatment

DESIGN OF THE STUDY

Pre-test post-test control group quassi experimental design was used in the study.

SAMPLE OF THE STUDY

The sample of the study comprised of 64 IXth grade students of middle strata and moderate intelligence studying in Shri Mahavir Jain High School, Jhajjar. All the 64 students were divided into experimental group (E) and control group (C).

TOOLS USED

A.)   G.C. Ahuja Group test of intelligence (GGTI-A) by Ahuja (2012)

Intelligence level of the subjects was assessed using G.C. Ahuja Group Test of intelligence (GGTI) developed by Ahuja. The reliability coefficient by test-retest method was found to be 0.84+0.21 which represents a high correlation.

B.)   Socio-Economic Status Scale- Urban and Rural (SESS-UR) by Kalia and Sahu (2012)

Socio-economic status scale by Kalia & Sahu was used to measure socio economic status of students. Reliability of the English version of the scale was 0.68 (split-half method) & 0.86 (by test-retest method). Reliability of the Hindi version of the scale was 0.71 (split-half method) & 0.89 (by test-retest method).

C.)   Stress inventory for school students by Singh & Rani (2011)

Stress inventory for school students by Singh & Rani was used to assess academic stress of students. The test-retest reliability was found to be 0.80 which was statistically significant. The face validity of the inventory and content validity found to be on higher side.

D.)   Instructional Material

Cooperative Learning Lesson Plans, Worksheets, and Formative Tests developed by investigator were used.

PROCEDURE FOLLOWED

To examine the effect of cooperative learning strategy i.e. STAD (Student Team Achievement Division) on the academic stress of high school students. Two groups were formed i.e. experimental group and control group. To know the level of academic stress of high school, the investigator applied stress inventory for school students by Singh & Rani (2011). The seven weeks instructional treatment i.e. STAD (Student Team Achievement Division) under cooperative learning given to experimental group and conventional teaching to control group. After completing experimental treatment post test scores of academic stress were obtained by applying stress inventory for school students.

STATISTICAL TECHNIQUES USED

Statistical techniques like Mean, S.D., Two way ANOVA with 2x2 factorial design were employed to analyze the obtained data.

ANALYSIS AND DISCUSSION

Effect of Instructional Treatment i.e. Student Team Achievement Division (STAD) under Cooperative Learning Strategy & Gender on Academic Stress of High School Students

It was essential to test homogeneity of variance at first to see the effects of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy and gender on academic stress, as two way ANOVA (with 2x2 factorial design) is relatively responsive to heterogeneity of variance. Homogeneity of variance was tested by applying Levene's test of homogeneity. $F_{Levene's}$ is 1.825 with degree of freedom 3 & 60 (p= 0.152) which does not fall in the critical region this means to acceptance of H_0 ($\sigma^2 A = \sigma^2 B = \sigma^2 C = \sigma^2 D$). Therefore, it is rational to consider that the variance of 4 groups are homogeneous i.e. the groups are assumed to have alike or equal variance. Data was subjected to analysis of variance with (2x2) factorial design for studying the interaction effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy & gender on academic stress. The means and S.D's of different sub-samples have also been given in the Table 1 and Figure1. The summary of ANOVA (2X2) has been further presented in Table 2, which is analyzed in terms of main effect and interaction effect.

Table 1

Summary of Descriptive statistics i.e. Means and S.D's of sub samples for post-test Academic Stress scores with respect to Instructional Treatment and Gender

Group ⟶ Gender ↓	Experimental Group (E)	Control Group (C)
Boys	n =16 M= 82.63 S.D.= 14.217	n = 16 M=94 S.D.=14.048
Girls	n = 16 M=106.69 S.D.=8.799	n = 16 M=114.81 S.D.=18.276

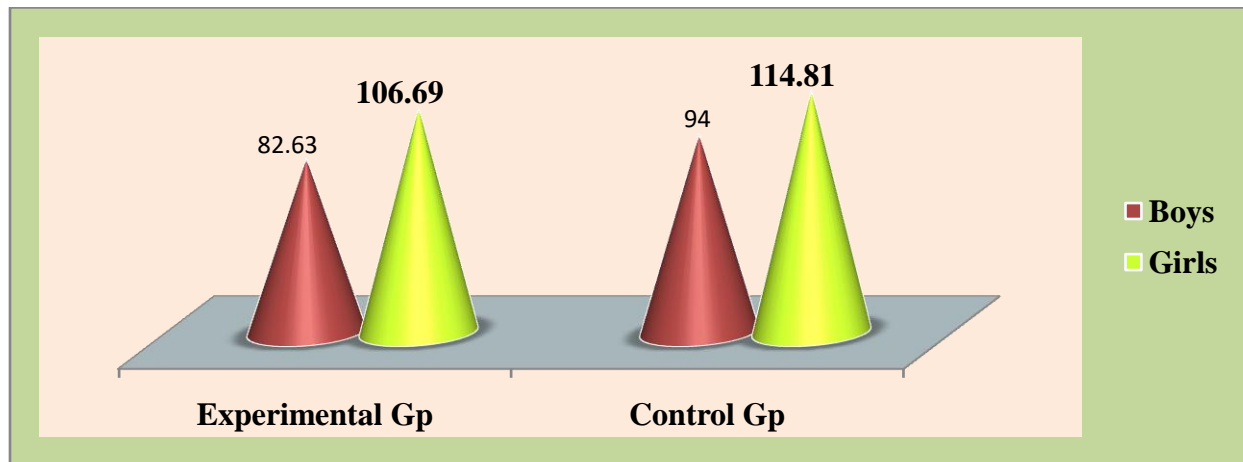|		
Total	n = 32 M= 94.66 S.D.=16.873	n = 32 M=104.41 S.D.=19.207

Fig. 1: Mean Academic Stress Scores of sub samples of 2x2 Design

Table 2

Summary of 2x2 ANOVA for Mean Academic Stress Scores of students with respect to Instructional Treatment and Gender

Source of variation	d_f	Sum of Squares (SS)	Mean Sum of Squares (MS)	F- Value	p-value
Main Effects					
Instructional Treatment (A)	1	1521.00	1521.00	7.503	0.008**
Gender (B)	1	8055.063	8055.063	39.734	0.000**
Double Interaction Effects					
Instructional Treatment x Gender (A x B)	1	42.250	42.250	0.208	0.650(NS)
Between cells	3	9618.313	------------	----------	
Within Subjects	60	12163.625	202.727	-----------	
Total	63	21781.938	------------	------------	

** Significant at 0.01 level   NS= Not Significant

MAIN EFFECTS

A.   INSTRUCTIONAL TREATMENT (A)

Table-2 revealed that F-ratio (7.503) for main effect of instructional treatment on post-test academic stress scores is found significant at 0.01 level of significance which leads to inference that a significant difference was yielded by instructional treatment in academic stress scores of students. Therefore, the null hypothesis H_{01}, *"There exists no significant effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy on academic stress of students after experimental treatment"* is rejected. Pushpanjali and Satyaprakasha (2010) also found that "cooperative learning strategy was effective in significantly reducing the anxiety". The results has been also supported by the findings of Wichadee (2010) who found that "relaxed classroom atmosphere of cooperative learning was significant in reducing anxiety among students & when students' anxiety decreases, they tend to perform better tasks".

To investigate further, the 't'- values were computed and have been given in the Table-3. Mean academic stress scores for main effect of instructional treatment on academic stress of students have been given in the figure 2.

Table-3

't' values for the Mean Academic Stress Scores of Experimental and Control group with respect to Instructional Treatment

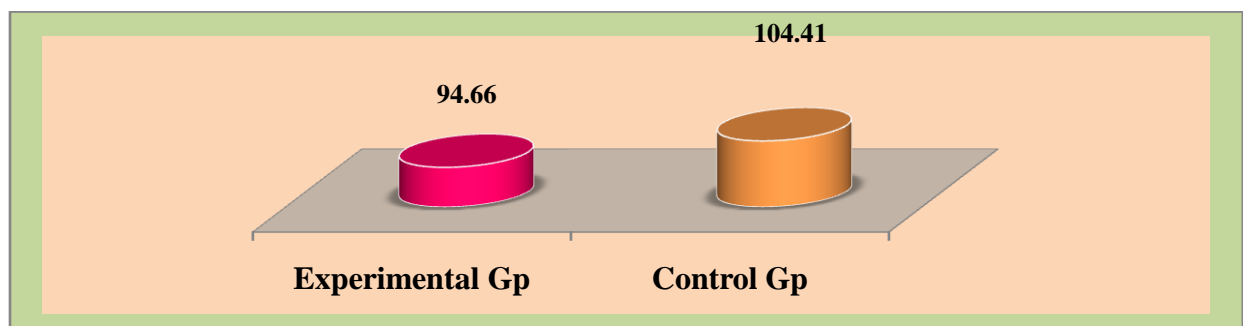| Group	N	Mean	S.D.	't' value
Experimental Group	32	94.66	16.87	2.157*
Control Group	32	104.41	19.20	

*Significant at 0.05 level

Fig. 2: Mean Academic Stress Scores for Main Effect of Instructional Treatment on Academic Stress of students

Table 3 illustrates the effect of instructional treatment on academic stress of students. The mean value for control group was found to be 104.41 while for experimental group it was 94.66. Also the 't'- value 2.157 was found to be significant at 0.05 level of significance which indicates that students of control group have higher academic stress than the students of experimental group. Results revealed that students taught through cooperative learning reduced their academic stress significantly to a higher extent than those instructed through conventional method of teaching. "Students feel less anxious when working with partners and in small groups. So, working in cooperative learning environment is believed to reduce anxiety" (Kagan, 1994).

GENDER (B)

Table 2 revealed that F-ratio (39.734) for the main effect of gender on academic stress of students is significant at 0.01 level of significance which indicates that academic stress of school students was significantly affected by gender. Therefore, the null hypothesis H_{02} "*There exists no significant effect of gender on academic stress of students after experimental treatment*" is rejected. In order to investigate further, the 't'- value was computed and has been given in the Table 4. The mean academic stress scores for the effect of gender on academic stress have been presented in Figure 3.

Table-4

't' values for the Mean Academic Stress Scores of Boys and Girls

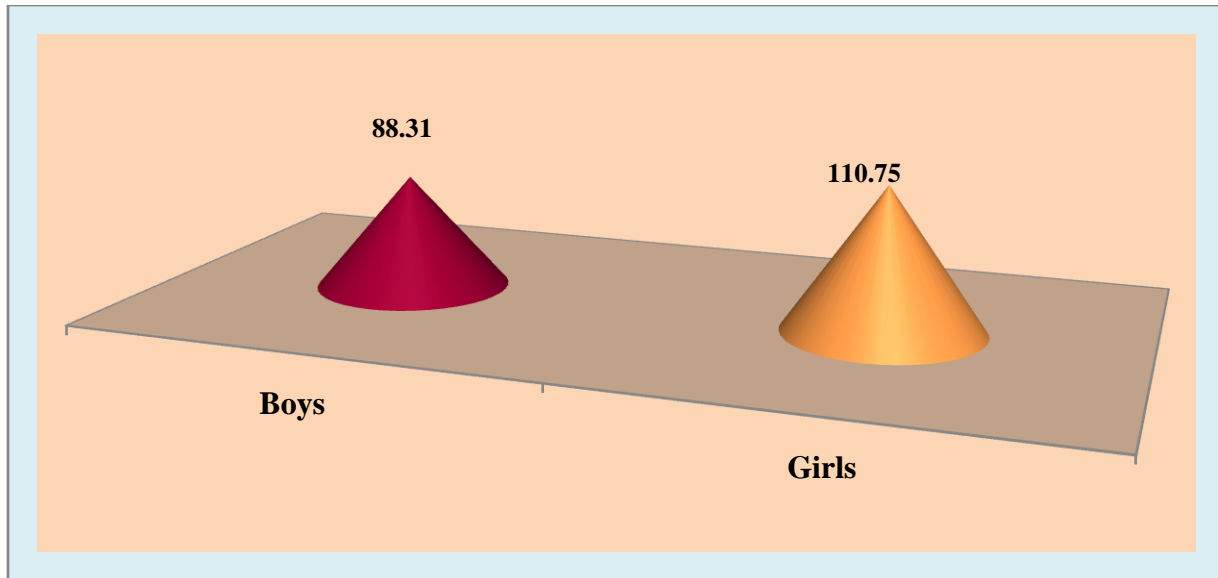| Group	N	Mean	S.D.	't' value
Boys	32	88.31	15.056	6.032**
Girls	32	110.75	14.701	

**Significant at 0.01 level

Fig. 3: Mean Academic Stress Scores for Main Effect of Gender on Academic Stress of students

Table 4 depicts that the 't'- value 6.032 for the mean post-test academic stress scores between boys and girls was significant at 0.01 level which leads to conclusion that boys and girls learning through Student Team Achievement Division (STAD) under cooperative learning are not equal in their level of academic stress. In context to mean scores, there was found difference in the means of post-test academic stress scores of boys and girls group. The mean scores of girls (110.75) was greater than the boys (88.31) which indicated that boys group reduced their academic stress to a greater extent than their counterparts girls students after being exposed to instructional treatment.

INSTRUCTIONAL TREATMENT (A) X GENDER (B)

The F-value from Table 2 for the interaction between instructional treatment and gender for mean academic stress scores is 0.208 which is found to be not significant leading to the information that two variables does not interact with each other to have an effect on mean academic stress scores therefore, the null hypothesis H_{03} *"There exists no significant interaction effect of instructional treatment i.e. Student Team Achievement Division (STAD) under cooperative learning strategy and gender on mean academic stress of students after experimental treatment"* is retained. The interaction effect of instructional treatment and gender on mean academic stress of students has been illustrated in Fig. 4.
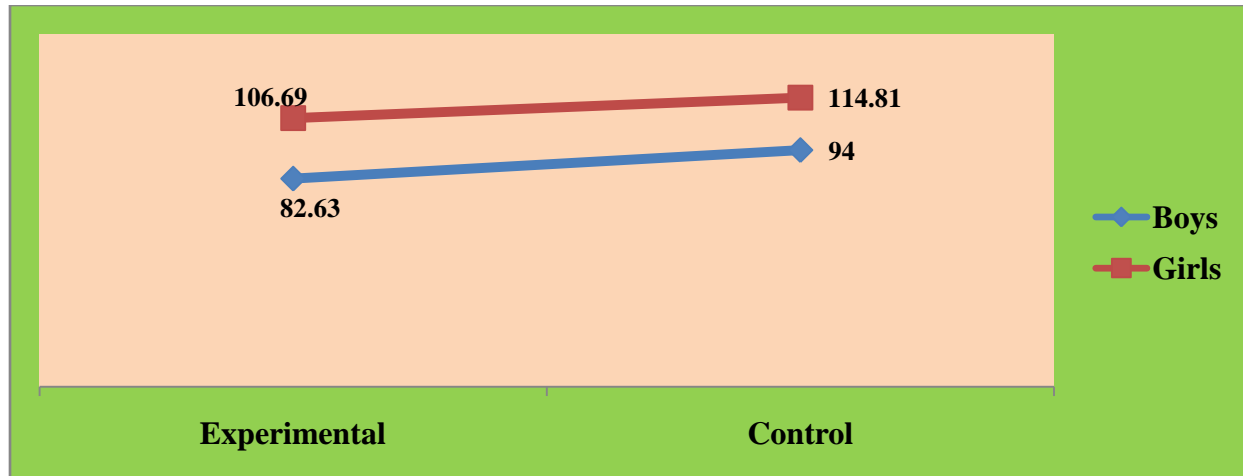
106.69   114.81

94

82.63

Boys
Girls

Experimental   Control

Fig. 4. : Interaction Effect of Instructional Treatment and Gender on Mean Academic Stress of students

The graphical presentation for AxB as in fig. 4 indicates that there is no significant interaction effect of instructional treatment i.e. STAD (Student Team Achievement Division) under cooperative learning & conventional teaching method of experimental group and control group respectively and Gender i.e. male (M) and female (F) on academic stress of students as the two lines do not interact on experimental group and control group.

FINDINGS OF THE STUDY

1.   Instructional treatment was found to have a significant effect on academic stress of students. The mean value for control group was found to be 104.41 while for experimental group it was 94.66. Also the 't'- value 2.157 was found to be significant at 0.05 level of significance, which indicates that students of control group have higher academic stress than the students of experimental group. Results revealed that students taught through Student Team Achievement Division (STAD) under cooperative learning reduced their academic stress significantly to a higher extent than those taught through conventional method.

2.   Academic stress scores of students were found significantly affected by gender. This lead to conclusion that boys and girls taught through Student Team Achievement Division (STAD) under cooperative learning are not equal in their level of academic stress. In context to mean scores, there was found difference in the means of post-test academic stress scores of boys and girls group. The mean scores of girls (110.75) was greater than the boys (88.31) which indicated

that boys reduced their academic stress to a greater extent than their counterparts girls students after being exposed to experimental treatment

3.   Instructional treatment & gender were found to have no significant interaction effect on academic stress of students leading to inference that two variables does not interact with each other to have an effect on mean academic stress scores.

CONCLUSION

It has been concluded that cooperative learning strategy i.e. STAD provides greater interaction among learners to interact with each other. Cooperative learning method is superior to conventional method of teaching. As academic stress found to have negatively impacted through the use of cooperative learning strategy i.e. Student Team Achievement Division (STAD), we can say that teaching through cooperative learning contribute to prepare learners having lower academic stress.

REFERENCES

- **Ahuja, G.C. (2012).** Group Test of Intelligence (G.G.T.I.). Agra: National Psychological Corporation

- **Kagan, S. (1994).** Cooperative learning. San Clemente, CA: Kagan Publishing (2003). A brief history of Kagan structures. Kagan Online Magazine. Cited in October 12, 2010, from www.kaganonline.com/KaganClub/FreeArticles

- **Kalia, A.K. & Sahu, S. (2012).** Socio-Economic Status Scale (Urban & Rural) SESS-UR-KASS. Agra: National Psychological Corporation

- **Lazarus, R.S. & Cohen, J.B. (1977**). Environmental Stress. In I. Altman and J.F. Wohlwill (eds.), Human Behavior and Environment. New York: Plenum.

- **Lazarus, R.S. & Folkman, S. (1984).** Stress, Appraisal, and Coping. New York: Springer.

- **Pushpanjali, B.S. & Satyaprakasha, C.V. (2010).** Effect of cooperative learning on achievement motivation & anxiety. *Edutrack*, 10, 32-37.

- **Singh, B.B. & Rani, S. (2011).** Stress inventory for school students. Agra: H.P. Bhargava Book House

- **Wichadee, S. (2010).** Cooperative learning approach: A successful way of reducing learning anxiety in an EFL class. *International journal of Education*, 33(3), 3-7