ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

Effect of Student Teams Achievement Divisions (STAD) Method on Critical Thinking of Secondary School Students

Dr. Babita Arora

Associate Professor, Partap College of Education, Humbran Road , Ludhiana, Punjab, India

ABSTRACT: The Present investigation aims at Studying the effect of the "STAD---Student Team Division Method" on the Critical Thinking of the Senior Secondary Students. Co-operative Learning and Critical Thinking were the selected variables for the present study and the experimental survey method of the investigation was employed. A significant difference exists between the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach on Critical Thinking. It concluded that the teaching through Teams Achievement Division Method contributes positively in the Critical Thinking of students. No significant difference was found between boys and girls students on Critical of students. The groups of students do not differ significantly on Critical thinking due to interaction between teaching method and gender. This implies that interaction between teaching method teaching method and gender contributes in the Critical thinking of students. The students having high, average and low levels of Critical thinking after constructivist approach differ significantly in their gain in Critical thinking.

KEYWORDS: Students Team Achievement Divisions Method , Critical Thinking, Co-operative Learning

I. INTRODUCTION

As a classroom organization and instructional method, co-operative learning merits serious consideration for use in thinking classrooms. Co-operative learning is more than just group work. In traditional group learning, students work in groups with no attention paid to group functioning, whereas in co-operative learning, group work is carefully prepared, planned, and monitored. Four key thinking strategies in co-operative learning are: problem solving, decision making, critical thinking, and creative thinking. Most research studies have found that cooperative learning is more effective than other modes of instruction for higher level thinking tasks, although this has not been the case in all studies. A number of theoretical perspectives (and associated cooperative learning activities) underlie work in co-operative learning, such as social psychology (Jigsaw technique), developmental psychology (Co-operative Controversy, Pairs Check), cognitive psychology (MURDER-Mood, Understand, Recall, Detect, Elaborate and Review), motivation theory (STAD -Student Teams Achievement Divisions), multiple intelligences theory (Talking Chips), humanistic psychology (group investigation) and global education/moral values education. Co-operative learning can support an environment in which students feel encouraged to take part in higher order thinking.

Co-operative learning :Co-operative learning is a process by which students work together in groups "to master the material initially presented by teacher" (Slavin, 1990). To be successful, all members in a group must achieve mastery of the material or contribute to the completion of a group assignment. Co-operative learning promoted academic achievement is a relatively easy to implement and is not expensive. Children improved behavior and attendance and increased liking of school are some of the benefits of cooperative learning (Slavin, 1987). Although much of the research on cooperative learning has been done with older students, cooperative learning strategies are effective with younger children in pre-school centre and primary classrooms as well, in addition, co-operative learning promotes students' motivation, encourages group processes, fosters social and academic interaction among students and rewards successful group participation in the learning of school subjects.

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

In co-operative learning, teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping team mates learn, thus, creating an atmosphere of achievement. Co-operative effort results in participants striving for mutual benefits so that all group members:

- Gain from each other's efforts.
- Recognize that all group members share a common fate.
- Know that one's performance is mutually caused by oneself and one's team members.

Feel proud and jointly celebrate when a group member is recognized for achievement

Critical Thinking: The art of calculation is as eta as man and Critical Thinking has been one of the tools used in our daily life's to deal with the challenges for survival. On a daily bases people were faced with decisions that require reasoning, understanding, interpreting, analyzing and evaluating information before them. This process involves Critical Thinking because it would enable one to take reliable and valid decisions, act ethically, and be able to adapt to changes in any given environment. Critical Thinking is a complex concept that involves cognitive skills and affective dispositions. Critical Thinking requires one's efforts to collect, interpret, analyze and evaluate information for the purpose of arriving at a reliable and valid conclusion.

The intellectual roots of critical thinking are as ancient as its etymology, traceable, ultimately, to the teaching practice and vision of Socrates 2,500 years ago who discovered by a method of probing questioning that people could not rationally justify their confident claims to knowledge. Confused meanings, inadequate evidence, or self-contradictory beliefs often lurked beneath smooth but largely empty rhetoric. Socrates established the fact that one cannot depend upon those in "authority' to have sound knowledge and insight. He demonstrated.

Critical Thinking may also involve logical reasoning and ability to separate facts from opinion, examine information critically with evidence before accepting or rejecting ideas and questions in relation to the issue at hand. In other words, it makes individuals to think, question issues, challenge ideas, generate solutions to problems and take intelligent decisions when faced with challenges. Critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way. People who think critically consistently attempt to live rationally, reasonably, empathically. They are keenly aware of the inherently flawed nature of human thinking when left unchecked. They strive to diminish the power of their egocentric and sociocentric tendencies. They use the intellectual tools that critical thinking offers — concepts and principles that enable them to analyze, assess, and improve thinking.

II. RELATED WORK

Studies Related to Students Team Achievement Divisions Method and Critical Thinking by different researchers:

1. Shimazoe and Aldrich (2010), "provide several benefits on the use of co-operative learning approach for the Students. First, co-operative learning promotes deep learning of materials. Second, students achieve better grades in the co-operative learning compared to competitive and individual learning. Third, students learn social skills and Civic Values. Fourth, students learn higher-order, Critical Thinking skills. Fifth, co-operative learning promotes personal growth. Finally, students develop positive attitudes toward autonomous learning.
2. Van Wyk (2012), 'investigated the effects of the STAD-co-operative learning method on student's achievement, attitude and motivation in Economics education. This study explores the effects of STAD on student achievement, attitude and motivation in economics education. Three research instruments, a Test of Economic Literacy (TEL): A Motivation Scale and an Economics Modular Test were employed for the purpose of this study. Quasi-experimental research, a protest-posttest design was constructed for the purpose of this research. Results revealed that STAD compared to direct instruction promoted positive attitudes, showed better achievements and motivated students to learn in economics education.
3. Jeyanthamary and Selvakumar (2013), investigated on "Critical Thinking" dispositions of Higher Secondary Students. The findings of the Study were: If there was significant difference between male and female students in the dimensions of the maturity, innovations and Critical Thinking dispositions in total, ii) there was significant difference between the Tamil and English Medium Higher Secondary Students in the dimension of

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

innovations but not significantly different in the dimension of the maturity and Critical Thinking dispositions in total.

4. Gurubasappa (2014), investigated on the "Critical Thinking", emotional intelligence and their effect on the academic achievement in Science of Secondary School Students". The findings of the Study were (i) there was a significant effect of Critical Thinking on the academic achievement in Science of Secondary School Students (ii) there was significant effect of emotional intelligence on the academic achievement in Science of the Secondary School Students and (iii) there was a significant main and interactive effect of Critical Thinking and emotional intelligence on the academic achievement in the Science of Secondary School Students.
5. Garcha and Kumar (2015), studied the effectiveness of Co-operative Learning (Jigsaw strategy) on Critical thinking Dispositions of secondary school students. Total 116 students of class 9th studying in a school affiliated to P.S.E.B were taken as sample. Data was collected by using Critical Thinking in everyday Life developed by Mincemoyer, Perkins, Munyua (2001) which was revalidated on Indian population by Malhan (2011). By employing 2x2 factorial design of ANCOVA results showed that students taught through co-operative learning strategy (Jigsaw) (Mean=27.12, N=57) achieved significantly higher Critical thinking Dispositions as compared to traditional method of teaching (Mean=22.39, N=59). Critical thinking Dispositions was found to be independent of interaction between treatment and gender.

The rapid social and technological changes during the past few decades have impacted our lives in one way or another. With the emphasis today on the employability of graduates, the debate is on whether classroom practices have much relevance to the 'real world'. Development and improvement of critical thinking through cooperative learning is one of the primary goals of education. Critical thinking is important for quality work in today's life. Consciously and reasonable learning in interactive teaching with a focus on critical thinking, helps the student achieve positive results in any area. Critical thinking is, therefore, an opinion of a higher order because it involves a process of assessment, analysis and synthesis and has no mechanical application. At higher education, as universities are the final pit stop for students before they embark to working life, we, the educators, must be mindful of the demands of the workforce. This research will focus on how effective cooperative learning and conscious use of problem solving tools can aid students to develop their thinking skills which in turn can positively affect their personal, interactive and analytical skills – skills vital in the workforce.

III. OBJECTIVES OF THE STUDY

1. To find out the significant difference in Critical Thinking of the group taught through Student Teams Achievement Divisions Method and Traditional Method
2. To find out the significant difference between Critical Thinking of boys and girls
3. To find out the first order interaction between teaching method and gender on the variable of Critical Thinking.

IV. HYPOTHESES

1. There exists no significant difference in the mean gain scores on Critical Thinking of the groups taught through Student Teams Achievement Divisions method and Traditional Method.
2. There exists no significant difference in the mean gain score on Critical Thinking of boys and girls.
3. There exists no significant Interaction between teaching methods and gender on the variables of Critical Thinking.

V. SAMPLE

The sample was consisted of 100 (50 boys and 50 girls) senior secondary school students. The study was conducted on the 9th class students. Only Vishvakarma Senior Secondary School, Dholewal Chowk was taken from Ludhiana district.

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

VI. TOOLS USED

1. Instructional Material based on the "STAD" approach to be developed by the Investigator.
2. Critical Thinking in everyday Life (Mincemoyer; Perkins; Munyua, 2001) and revalidated on Indian Population by Mallian (2011).

VII. RESULTS AND DISCUSSION

a) t-test to estimate the difference of mean gain scores in Critical Thinking belonging to experimental and control group after taught through Student Teams Achievement Division Method.
b) t-test to estimate the difference of mean gain scores in Critical Thinking of boys and girls.
c) 2x2 analysis of variance was employed to ascertain the difference in the mean gain scores of the Critical Thinking belonging to experimental and control group after taught through Student Teams Achievement Division Method due to interaction with gender.

Table 1
Significance of difference in Mean Gain Scores of Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and Traditional Approach (N=100)

Groups	Variable	N	Mean	S.D.	SE_M	t-ratio	Sig/Not Sig
Experimental Group	Critical Thinking	50	5.68	7.31	1.03	2.81	Sig at .01 level
Control Group		50	0.02	12.25	1.73		

Table 1 reveals that

- The mean gain score of Critical Thinking of the group of students taught through Student Teams Achievement Division Method is 5.68 and S.D. for the same is 7.31 whereas the mean gain score of Critical Thinking of the group of students taught through Traditional Approach is 0.02 and S.D. for the same 12.25. The value of t-ratio came out 2.81, which is significant at 0.01 level. It indicates that there exists a significant difference in Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach.

As a significant difference was found in Critical Thinking between the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach, therefore hypothesis **1** stating 'There exists no significant difference in the mean gain scores of Critical Thinking of groups taught through Student Teams Achievement Division Method and traditional method' stands rejected.

Further as the mean gain score of the group of students taught through Student Teams Achievement Division Method was found to be significantly higher than that of the group of students taught through Traditional Approach, it may also be concluded that the group of students taught through Student Teams Achievement Division Method is enhanced significantly than the group of students taught through Traditional Approach. Thus the Student Teams Achievement Division Method contribute significantly in Critical Thinking of students.

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

Fig. 1
Mean Gain Scores of Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and Traditional Approach (N=100)

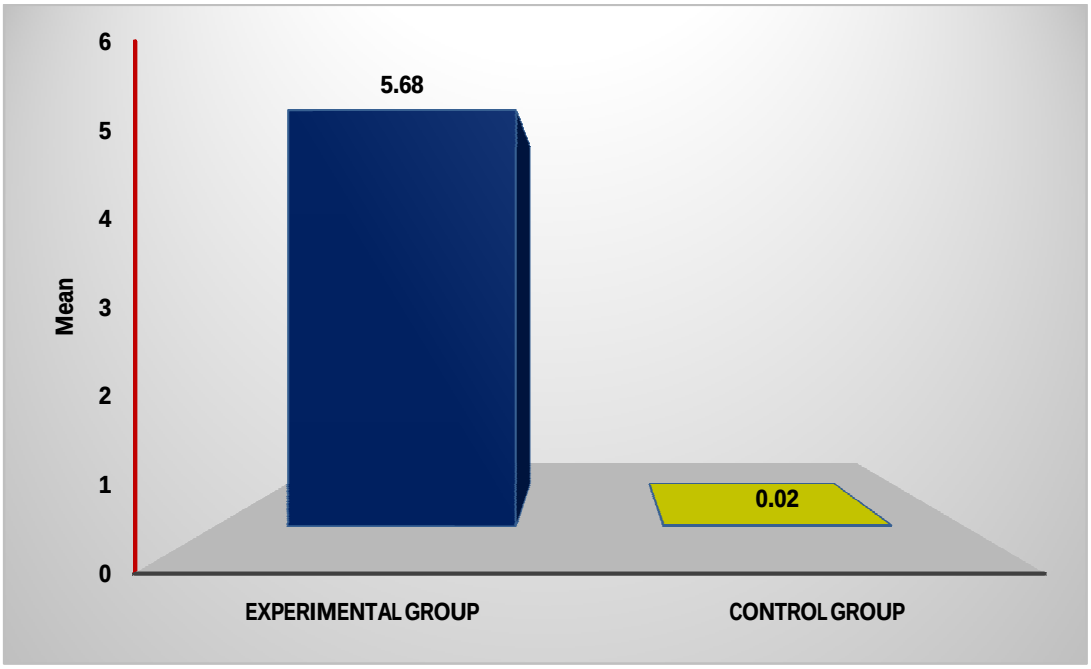

Table 2
Significance of difference in Mean Gain Scores of Critical Thinking of Boys and Girls (N=100)

Groups	Variable	N	Mean	S.D.	SE_M	t-ratio	Sig/Not Sig
Boys	**Critical Thinking**	50	1.80	9.33	1.32	1.01	Not Sig
Girls		50	3.90	11.42	1.62		

Table 2 reveals that

- The mean gain score of Critical Thinking of boys is 1.80 and S.D. for the same is 9.33 whereas the mean gain score of Critical Thinking of girls is 3.90and S.D. for the same 11.42. The value of t-ratio came out 1.01, which is not significant at 0.05 level. It indicates that there exists no significant difference in Critical Thinking of boys and girls.

As no significant difference was found in the gain scores of Critical Thinking of boys and girls, therefore hypothesis **2** stating 'There exists no significant difference in the mean gain scores of Critical Thinking of boys and girls' stands accepted.

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

Fig. 2
Mean Gain Scores of Critical Thinking of Boys and Girls (N=100)

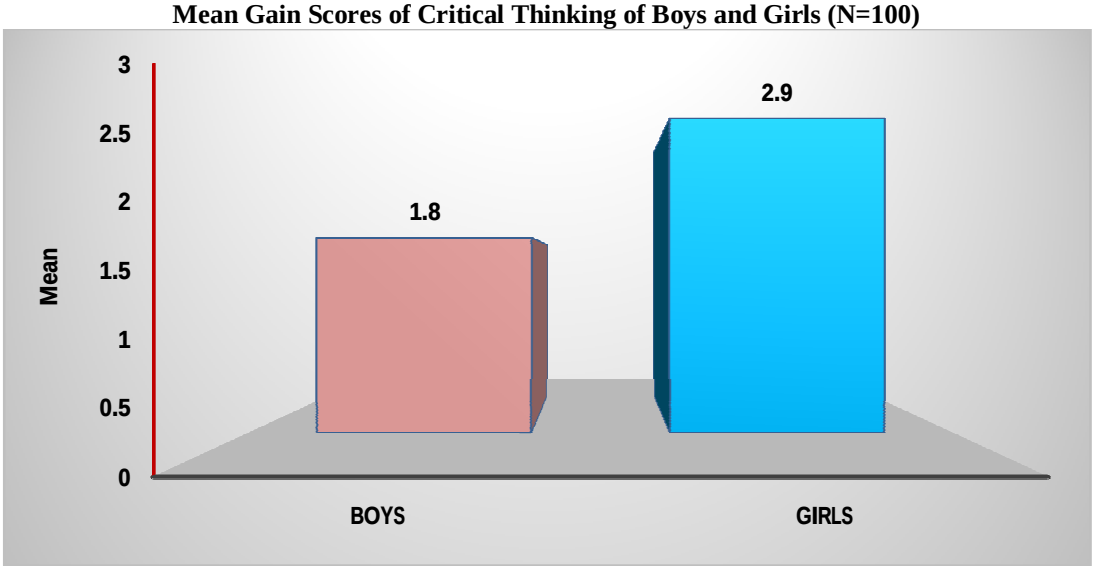

Table 3
Significance of difference in Mean Gain Scores of Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and Traditional Approach in relation to Gender (N=80)

Variable	Source of Variance	SS	d_f	MS	F-Value
Critical Thinking	Teaching Approach (A)	800.89	1	800.89	8.12**
	Gender (B)	110.25	1	110.25	1.12
	Teaching Approach x Gender (AxB)	388.09	1	388.09	3.94*
	Within Group (Error)	9467.52	96	98.62	
	Total	10766.75	99		

****** *Significant at 0.01 level* ****** *Significant at 0.05 level*

To find out the difference in mean gain scores of Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach in relation to gender (male and female), 2x2 ANOVA was employed.

INTERPRETATION

MAIN EFFECT

Main Effect A: Main effect of Student Teams Achievement Division Method on Critical Thinking of the students (N=100)

Table 3 reveals that

- The F-ratio for the difference in mean gain scores of Critical Thinking of the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach came out 8.12, which is significant at 0.01 level.

This indicated that the group of the students taught through Student Teams Achievement Division Method and taught through Traditional Approach differ significantly on the variable of Critical Thinking. The result is in correspondence to the result shown in Table 4.3.

Main Effect B: Main effect of Gender on Critical Thinking of the groups of students (N=100)

Table 3 reveals that

- The F-ratio for the difference in mean gain scores of Critical Thinking of boys and girls came out 1.12, which is

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

not significant.

This indicated that boys and girls do not differ significantly on the variable of Critical Thinking. The result is in correspondence to the result shown in Table 4.4.

INTERACTIONAL EFFECT (AxB)

Interactional Effect of Student Teams Achievement Division Method and Gender on Critical Thinking Critical Thinking of students (N=100)

Table 3 reveals that

- The F-ratio for the difference in mean gain scores of Critical Thinking of students due to interaction between Student Teams Achievement Division Method and gender came out be 3.94 which is significantat 0.05 level. This reveals that there exists a significant interactional effect of Teaching Method and gender on Critical Thinking of students.

It indicates that the students differ significantly on Critical Thinking due to interaction between Student Teams Achievement Division Method and gender.

Therefore hypothesis 3 stating 'There exists no significant interaction between teaching method and gender on the variable of critical thinking' stands rejected.

VII. CONCLUSIONS

The following conclusions were drawn from the analysis of the data

1. A significant difference exists between the groups of students taught through Student Teams Achievement Division Method and taught through Traditional Approach on Critical Thinking.
2. As a significant difference was found between the groups of students taught through Teams Achievement Division Method Teams Achievement Division Method and taught through Traditional Approach on Critical Thinking with students taught through Teams Achievement Division Method getting higher mean score than their counterparts, hence it may be concluded that the teaching through Teams Achievement Division Method contributes positively in the Critical Thinking of students.
3. No significant difference was found between boys and girls students on Critical of students.
4. The groups of students do not differ significantly on Critical thinking due to interaction between teaching method and gender. This implies that interaction between teaching method teaching method and gender contributes in the Critical thinking of students.
5. The students having high, average and low levels of Critical thinking after constructivist approach differ significantly in their gain in Critical thinking.

IX. EDUCATIONAL IMPLICATIONS OF THE STUDY

The present study shows that there exists a significant difference taught the student through STAD Method and Traditional Approach. But on the other hand, no significant difference was found on the basis of gender. It was also found that critical thinking of the students also flourishes if taught through STAD Method. The students become more critical and rational in thinking. So it is concluded that teaching through STAD Method effects positively on the critical thinking of the students. In this way this study can definitely help teachers, policy planners and others who are willing to improve educational standards of the school.

REFERENCES

1. H.D.Gurubasappa, "Critical Thinking, Emotional Intelligence and their effect on Academic Achievement in Science of Secondary School Students", Journal of Educational Research and Extension, vol.5,no.1,pp. 7-12, 2014.
2. A.Jeyanthamary and D.S.Selvakumar, "Critical Thinking dispositions of Higher Secondary Students. Meston", Journal of Research in Education, vol.12,no.2,pp. 41-46, 2013.
3. C.Mincemoyer, D.F.Perkins and C.Munyua, "Critical Thinking in Everyday Life, Youth Life Skills", Evaluation project at the Pennsylvania State University, 2001

ISSN (Online): 2319-8753
ISSN (Print) : 2347-6710

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

4. J.Shimazoe and H.Aldrich, "Group Work can be gratifying : Understanding and overcoming resistance to Co-operative Learnin", Coll Teach,vol.58, pp.52-57,2010.
5. R.E.Slavin, "Developmental and motivational perspectives on co-operative learning: A reconciliation. Child Development",vol. 58,pp. 1161-1167, 1987.
6. R. E.Slavin, "Co-operative learning: Theory, research and practice. Massachusetts: Allyn and Bacon", 1990.
7. W.Van, "The effects of the "STAD—Co-operative Learning Method on Student Achievement, Attitude and Motivation in Economics Education", Journal of Social Science, vol.33,no.2,pp.261-270, 2012