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EFFECT OF FACE TO FACE COLLABORATIVE LEARNING APPROACH ON ACHIEVEMENT IN SOCIAL STUDIES IN RELATION TO COGNITIVE STYLE

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ABSTRACT:

The present study investigates the effect of face to face collaborative learning approach on achievement in social studies in relation to cognitive style. The sample of 100 students of 7th class taken from two different schools of Balachaur, SBS Nagar, affiliated to PSEB, SAS Nagar (Mohali), Punjab. Instructional material based on face to face collaborative learning approach were prepared and implemented to the experimental group after pre-testing. The gain scores were computed after post-test for all the students. Group Embedded Figure Test and Group Mental Ability Test were also administered. The data was analyzed statistically with the help of mean, SD and analytical variance. A two way (2×2) Analysis of Variance was used to arrive at the following conclusions: (i) Face to face collaborative learning approach group was found to attain significantly higher achievement scores as compared to control group. (ii) Performance of students with different cognitive style was found significant, (iii) significant interaction effect was found between face to face collaborative learning approach and cognitive style groups.



KEYWORDS: Teaching and learning, multidisciplinary enterprise, Collaboration.

1. INTRODUCTION

Teaching and learning in 21st century classroom is no longer an act of just transferring knowledge. The act of teaching has become a multidisciplinary enterprise to develop critical thinking, interaction and collaboration among learners (Nelson, 1994). The current educational system rewards student's achievement by separating students of different abilities rather than encouraging students to utilize their abilities to help each other. Collaboration has become 21st century trend. The need in society to think and work together on issues of critical concern has increased, shifting the emphasis from individual efforts to group work, from independence to community (Leonard & Leonard, 2001). Given these multidisciplinary changes in curriculum and its relative learning objectives, the need to collaborate in order to create learning environments has gained momentum in this decade. Instead of teacher-centered approaches, the focus has shifted to learner-centered and learning-centered strategies. In the current educational landscape, learners are no more the empty vessels to be filled in, rather they need to be the co creators of knowledge; they should be willing to take ownership of their learning and contribute to the development of knowledge.

Collaborative learning is a situation in which two or more people learn or attempt to learn something together, and more specifically as joint problem solving. Collaborative learning entails students to work together for common goal without immediate teacher supervision in groups small enough that all students can participate

collectively in a task (Hesse, Care, Buder, Sassenberg & Griffin, 2015). It is mutual engagement of participants in a coordinated effort to solve a problem together. The students are responsible for one another's learning as well as their own. Thus, the success of one student helps other students to be successful (Gokhale, 1995). The aspect of collaborative learning that is perhaps hardest to understand in detail is what may be called practices of meaning making in the context of joint activity; inter subjective learning or group cognition (Stahl, 2006). Face-to-face collaboration involves the social aspect of communication and the activities conducted in the common social space (Johnson & Hyde, 2003).

Cognitive styles refer to the preferred way of an individual's processes information. Unlike individual differences in abilities (Stenberg, 1997), which describe peak performance, styles describe a person's typical mode of thinking, remembering or problem solving. Armstrong, Peterson and Rayner (2012) defined cognitive style as "cognitive styles refer to individual differences in peoples preferred way of processing (perceiving, organizing and analyzing) information using cognitive brain-based mechanisms and structures". A number of cognitive styles have been identified and studied over the years. Field independence versus field dependence is probably the most well known style. At a perceptual level, field independent personalities are able to distinguish figures as discrete from their backgrounds compared to field dependent individuals who experience events in an undifferentiated way. In addition, field dependent individuals have a greater social orientation relative to field independent personalities. Studies have identified a number of connections between this cognitive style and learning (Messick, 1976). So face to face collaborative learning practices in social studies classes are intended to produce much more challenging instruction for students with different cognitive styles and thus produce improved meaningful learning.

NEED AND SIGNIFICANCE

It is the talk of long ago when every word said by the teacher in the class was the final word for every student, place of the teacher was on higher level and the teacher was treated as guru. With the passage of time the needs of the learners in the classroom are changing day by day. Role of teacher's and student's changing day after day. Earlier the learners were passive recipients only and teacher's role was just to transmit the knowledge, which is not enough for the 21st century learners. Today learners are active participant in the class with different cognitive abilities where role of teachers is just of facilitator. They love to work together as a team for common goal and to create new ideas for future generations. Team work has great importance as we know good teams are the key behind all of the best societies, organizations and nations. Learning through collaboration develops independent thinking. It thereafter leads to collaborate with students at global level; the students must be taught how to collaborate with other students for the best learning outcomes. So to develop the sense of cooperation among the young generation it is the responsibility of our teachers or teacher educators that they should provide an opportunity and platform to youngsters to, interact face to face to face, work together in team and work for each other which will definitely help them in achieving success in their lives and at work places. The need and significance of the study increases, as very few studies are conducted on collaborative learning, thus this research is intended to explore and to find the effect of collaborative learning approach on achievement in social study in relation to cognitive style.

OBJECTIVES

1. To compare the performance of group of students taught through face to face collaborative learning approach and conventional technique of teaching in social studies.
2. To study the performance of students with different cognitive style groups in social studies.
3. To examine the interaction effect between face to face collaborative learning approach and cognitive style on achievement in social studies.

HYPOTHESES

H₁: The performance of students of face to face collaborative learning approach group in social studies will be higher than the conventional group.

H₂: The performance of independent cognitive style groups will be higher than that of dependent cognitive style groups.

H₃: There will be significant interaction effect between face to face collaborative learning approach and cognitive style

Sample

The study was conducted on a random sample of 100 students of 7th class, both boys and girls including 50 students from Lef. General Bikram Singh Memorial Sen. Sec. School, Balachaur and 50 students from BAV Sen. Sec. School, Balachaur, SBS Nagar (Punjab). It was random and purposive sample. The study was conducted on two intact groups viz. one is experimental group and other is control group in each school. The two schools were randomly selected from the total schools of Balachaur.

Design

For the purpose of present investigation a pre-test and post-test factorial design was employed. In order to analyze the data (2×2) Analysis of Variance was used. Experimental group was taught through face to face collaborative learning approach and the control group was taught through conventional teaching approach. The study covers two independent variables viz. instructional strategy and cognitive style. The variables of instructional strategy were studied at two levels i. e. face to face collaborative learning approach and conventional teaching approach. The variable cognitive style was also studied at two levels i. e. field dependent and field independent cognitive style. The main dependent variable was achievement in social studies which will be calculated as the difference in pre-test and post-test scores for the subject.

Tools Used

The following tools were used for the collection of data:

1. Group Mental Ability Test by Jalota (1972) was used for matching the groups.
2. Group Embedded Figure Test by Witkin, Oltman, Raskin & Karp (1971) was used to classify the students according to their cognitive style.
3. Achievement Test in Social Studies was prepared and used by the investigators.
4. 10 Lessons in Social Studies, (Transport, Water Cycle and Ocean Movements, Environment, Atmospheric Pressure, Advertisement, Unpacking Gender, Natural Vegetation, Life in the Deserts, Soil and its Conservation and Major Landforms of the Earth) based on Face to Face Collaborative Learning Approach and Conventional Teaching Approach were prepared by the investigators.

Procedure

After the selection of the sample and allocation of students to the two instructional strategies, the experiment was conducted in six phases. Firstly, the investigator set a meeting with the principals of selected schools for the experiment. Secondly, group mental ability test was used for matching the group. Thirdly, group embedded figure test was administered in each school in order to identify the cognitive style of the students. Fourthly, pre test was administered on the total sample. The answer sheets were scored as per the scoring key to obtain the previous knowledge of the students. Fifthly, treatment was given to the experimental group. The experimental group was taught through face to face collaborative learning approach and control group was taught through conventional teaching approach. Sixthly, after the completion of the experiment, the post- test was administered to the students of both the groups. The answer-sheets were scored with the help of scoring key. Time limit for the test was 45 minutes.

ANALYSIS AND INTERPRETATION OF THE RESULTS

Analysis of Descriptive Statistics

The data were analyzed to determine the nature of the distribution of scores by employing mean and standard deviation. The two way analysis of variance was used to test the hypotheses related to strategies of

teaching and cognitive style of students. The mean and standard deviation of different sub groups have been presented in table- 1, 2 & 3.

Table-1: Means and SD of Achievement Scores for the Different Sub Groups

Cognitive Style	Teaching						Total		
	Face to Face Collaborative Learning Approach			Conventional Teaching Approach					
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Field dependent Style	25	17.14	4.02	25	6.39	1.88	50	11.76	6.16
Field independent Style	25	17.44	6.55	25	8.28	2.90	50	12.86	6.60
Total	50	17.29	5.54	50	7.33	3.06	N= 100		

Source: Field Study, 2017

It may be observed from the table-1 that the mean scores of face to face collaborative learning approach (M=17.29) is higher than the conventional teaching approach (M=7.33). This shows that face to face collaborative learning approach is more effective than the conventional teaching approach. It is also confirmed that the mean of the two groups i.e. field dependent cognitive style and field independent cognitive style group is 17.14 and 17.44 respectively. It is concluded that the gain mean with face to face collaborative learning approach has shown significant differences for field dependent cognitive style and field independent cognitive style students. These differences are also found in respect of the different cognitive style group taught through conventional teaching approach.

ANALYSIS OF VARIANCE ON ACHIEVEMENT SCORES

The mean of different sub-groups, sum of squares, degree of freedom, mean sum of squares and the F-ratio have been presented in table - 2

Table -2: Summary of Analysis of Variance (2x2) Factorial Designs

Source of Variance	Sum of Squares	Df	Mean Sum of Squares	F- ratio
Face to Face Collaborative Learning Approach (A)	1	2269.38	2269.38	108.32**
Cognitive Style (B)	1	134.56	134.56	6.42*
Interaction (A× B)	1	234.84	234.84	11.20**
Error	96	2011.52	20.95	

*Significance at the 0.05 level, **Significance at the 0.01 level
(Critical value 3.94 at 0.05 level and critical value 6.91 at 0.01 level), df 1/96

MAIN EFFECTS

Face to Face Collaborative Learning Approach (A)

It is observed from the table -2 that the F-ratio for difference in mean gain scores of face to face collaborative learning approach and conventional teaching approach group is 108.32, which in comparison to the table value was found significant at 0.01 level of significance. It shows that the groups were not different beyond the contribution of chance. Hence, the hypothesis H_1 : The performance of students of face to face collaborative learning approach group in social studies will be higher than the conventional group, is accepted.

The result indicates that the performance of face to face collaborative learning approach was more effective than that of the conventional teaching approach group in social studies.

Cognitive Style (B)

It is observed from the table-2 that the F-ratio for difference in mean gain of field dependent and field independent cognitive style is 6.42, which in comparison to the table value was found significant at 0.05 level of significance. This suggests that two groups were different in respect of achievement scores. Hence, the hypothesis H_2 : The performance of independent cognitive style groups will be higher than that of dependent cognitive style groups, is accepted. Thus a result indicates that performance of field independent group was better than field dependent group.

Interaction Effect (A × B)

It is observed from the table-2 that the F- ratio for the interaction between method of instruction and cognitive style of students is 11.20, which in comparison to the table value was found significant at 0.01 level of significance. It indicates that the two variables do interact with each other. Thus, the hypothesis H_3 : There will be significant interaction effect between face to face collaborative learning approach and cognitive style is accepted. It is concluded that there is significant difference in gain achievement scores in social studies due to interaction effect between teaching strategies and cognitive style of the learners.

To ascertain significance of difference of means of different combination groups, t-ratio were computed which have been placed in table-3

Table -3 Showing t-ratio of means of sub-groups of methods of instruction and cognitive style

Variables		Experimental Group						Control Group					
		Field Dependent Cognitive Style			Field Independent Cognitive Style			Field Dependent Cognitive style			Field Independent Cognitive Style		
		N	M	SD	N	M	SD	N	M	SD	N	M	SD
Experimental Group	Field Dependent Cognitive Style	25	17.14	4.02	25	17.44	6.55	25	6.39	1.88	25	8.28	2.90
	Field Independent Cognitive Style												
Control Group	Field Dependent Cognitive Style												
	Field Independent Cognitive Style												

**Significance at 0.01 level

(Critical Value 2.01 at 0.05 and 2.68 at 0.01 level, df 48)

Table-3 reveals that the mean gain score of field dependent cognitive style of experimental group is 17.14, which is lower than the corresponding mean gain score of field independent cognitive style of experimental group is 17.44. The t-value testing the significance of mean differences of field dependent and field independent cognitive style of experimental group is 0.19, which in comparison to the table value did not yield

significant difference even at 0.05 level of significance. Hence, the field dependent cognitive style of experimental group did not exhibit mean gain score than that of field independent cognitive style of experimental group.

Table-3 reveals that the mean gain score of field dependent cognitive style of experimental group is 17.14, which is higher than the corresponding mean gain score of field dependent cognitive style of control group is 6.39. The t-value testing the significance of mean differences of field dependent cognitive style of experimental and control group is 12.21, which in comparison to the table value found significant at 0.01 level of significance. Hence, the field dependent cognitive style of experimental group exhibit means gain scores than that of field dependent cognitive style of control group.

Table-3 reveals that the mean gain score of field dependent cognitive style of experimental group is 17.14, which is higher than the corresponding mean gain score of field independent cognitive style of control group is 8.28. The t-value testing the significance of mean differences of field dependent cognitive style of experimental and field independent cognitive style of control group is 9.04, which in comparison to the table value found significant at 0.01 level of significance. Hence, the field dependent cognitive style of experimental group exhibit means gain scores than that of field independent cognitive style of control group.

Table-3 reveals that the mean gain score of field independent cognitive style of experimental group is 17.44, which is higher than the corresponding mean gain score of field dependent cognitive style of control group is 6.39. The t-value testing the significance of mean differences of field independent cognitive style of experimental and field dependent cognitive style of control group is 8.12, which in comparison to the table value found significant at 0.01 level of significance. Hence, the field independent cognitive style of experimental group exhibit means gain scores than that of field dependent cognitive style of control group.

Table-3 reveals that the mean gain score of field independent cognitive style of experimental group is 17.44, which is higher than the corresponding mean gain score of field independent cognitive style of control group is 8.28. The t-value testing the significance of mean differences of field independent cognitive style of experimental and control group is 6.40, which in comparison to the table value found significant at 0.01 level of significance. Hence, the field independent cognitive style of experimental group exhibit means gain scores than that of field independent cognitive style of control group.

Table-3 reveals that the mean gain score of field dependent cognitive style of control group is 6.39, which is lower than the corresponding mean gain score of field independent cognitive style of control group is 8.28. The t-value testing the significance of mean differences of field dependent cognitive style and field independent cognitive style of control group is 2.73, which in comparison to the table value found significant at 0.01 level of significance. Hence, the field independent cognitive style of control group exhibit means gain scores than that of field dependent cognitive style of control group.

DISCUSSION

The result of the present investigation have lead to the conclusion that face to face collaborative learning approach yields higher levels of achievement in social studies as compared to the conventional teaching approach group. The hypothesis H1 was accepted. The results are supported by the finding of Kumar (2017); Prayekti (2015) Hsuing (2013); Parveen (2012); Aziz (2010); Guerra & Orozco (2009) and Adeyemi (2003); revealed that face to face collaborative learning approach was more effective than conventional teaching approach. The results are not supported by the findings of Gray and Meister (2009) revealed that there is no significant difference in achievement of students taught through face to face collaborative learning approach and conventional teaching approach.

There was significant difference in the gain achievement scores of field dependent cognitive style and field independent cognitive style of learners. Hence, hypothesis H2 was accepted.

The interaction between method of instruction and cognitive style of students on the gain achievement scores in social study was found to be significant. Hence, the hypothesis H3 was accepted. The results are supported by the finding of Peklaj (2013) and Tinajero, Castelo, Guisande and Páramo (2011), revealed that an interaction between teaching methodology and cognitive style were found significant. The results are not

supported by the findings of Vidal (2012) and Guerra and Orozco (2009), reveals that there is no interaction between teaching strategy and cognitive style.

FINDINGS

1. The performance of students in social studies taught through face to face collaborative learning approach was significantly higher than that of conventional teaching approach.
2. The performance of students in social studies shown significant differences in field dependent and field independent cognitive style groups.
3. There was significant difference in gain scores on achievement in social studies due to interaction effect of instructional strategy and cognitive style group.
 - The field dependent cognitive style of experimental group did not exhibit mean gain score than that of field independent cognitive style of experimental group.
 - The field dependent cognitive style of experimental group exhibited mean gain score than that of field dependent cognitive style of control group.
 - The field dependent cognitive style of experimental group exhibited mean gain score than that of field independent cognitive style of control group.
 - The field independent cognitive style of experimental group exhibited mean gain score than that of dependent cognitive style of control group.
 - The field independent cognitive style of experimental group exhibited mean gain score than that of field independent cognitive style of control group.
 - The field independent cognitive style of control group exhibited mean gain score than that of field dependent cognitive style of control group.

CONCLUSION

The present study reveals that the performance in social study of students taught through face to face collaborative learning approach was significantly higher than those which were taught through conventional teaching approach. Further, significant differences in the mean scores were found for field dependent and field independent cognitive style learners of experimental and control groups. However, the difference in mean gain achievement scores in social studies due to interaction effect between teaching strategies and cognitive style of the learners were found significant. So, the study recommends the use of face to face collaborative learning approach for better performance of 7th class social study students.

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