

AN EXPERIMENTAL STUDY OF ACHIEVEMENT OF SECONDARY STAGE STUDENTS THROUGH MNEMONIC TECHNIQUES IN RELATION TO SELF CONCEPT



Avanish Kumar

Assistant Professor , S.R.M.
College of Education,
Vill. Dandrawal,
Tehsil Raipur Rani, Distt
Panchkula, Haryana.

Abstract:-

The study was experimental in nature and conducted on the sample of 500 students, as per the requirements of 3*2 factorial design in which the independent variables of Mnemonic Techniques and Self Concept were studied. Achievement on some concepts of Social Studies was taken as a dependent variable. There were three levels of Mnemonic Techniques - With Illustrations (M1), Without Illustrations (M2) and Control Group (M0) - and two levels of the variable Self Concept (S) – High Self Concept (S1) & Low Self Concept (S2) -. The results showed that F ratios were significant for the main effects of Mnemonic Techniques (M) and Self Concept (S), and also for the double interaction effects of Mnemonic Techniques (M) * Self Concept (S).

Keywords:

Achievement, Mnemonic Techniques and Self Concept.



INTRODUCTION :-

ACHIEVEMENT

Achievement has been considered as an important factor in the educational life of the students. It encourages the students to work hard and learn more. It is the status or levels of a person's learning and his ability to apply what he has learned.

Achievement means the extent to which a learner is profiting from instructions in given area of learning, In other words Achievement is reflected by the extent to which skills or a person from the training imparted to him has acquired knowledge; it is the outcome of general and specific learning experience. The word Achievement indicates the learning outcome of students. As a result of learning different subjects, the behaviour pattern of the student's changes. Learning affects three major areas of behaviour of students (I) Cognitive (intellectual development, recall and recognition), (ii) Affective (self-concept and personal growth), and (iii) Psychomotor (developing of muscular skills).

MNEMONIC TECHNIQUES

"Mind is the great level of all things: Human thought is the process by which the human ends are ultimately answered"

-Daniel (2003)

Memory is the ability of our brains to retain the things we have learned. We can all identify occasions when we cannot recall things, which we should know. Memory is the process of registering, consolidating, storing, and recalling information. Poor memory does not mean that our brain lacks something. It may be because of lack of motivation and concentration that we fail to remember persons or names or a things. By practising a few mental exercises (mnemonics) we can enhance our memory power.

Mnemonic Techniques are those techniques that help a person to accurate and quick learning, durable retention, quick recognition and accurate and quick recalling of things or subject matter. Memory is a skill that every student can improve and benefit from it. In addition; they will enjoy better grades and greater success in their studies when they develop their memory to its full potential. Memory techniques are known as mnemonics. They are creative aids to memory. They work best when they are products of ones own imagination.

Mnemonics are methods for remembering information that is otherwise quite difficult to recall. The basic principle of mnemonics is to use as many of the best functions of the human brain as possible to code information. Mnemonics should be memorable. Mnemonic Techniques enhance the ability to learn, and reduce the time involved in learning the subject matter. Moreover, the retention ability of the learners is also increased.

SELF-CONCEPT

The term self-concept is so used in the field of education and psychology that in its most native sense it can be generally understood as the person's ideas, feelings and attitudes about one's self i.e. how one perceives one's self.

Sanchez & Roda (2007) define that Self-concept is the set of perceptions or reference points that the subject has about him selves, the set of characteristics, attributes, qualities and deficiencies, capacities and limits, values and relationships that the subject knows to be descriptive of himself and which he perceives as data concerning his identity.

A person's self concept is developed early in life and affects his functions in the environment. Children's self-concept is developed through this thought that what are the feelings of the people about them who are important in their lives. This is best expressed in the self-concept cycle:

As I see myself → Other's reactions → My actions to me → As others see me

Self-concept is a life long process that grows and develops continuously in social setting. An individual is not born with a self-concept nor does he inherit it, but he forms one as a result of his experiences and capacities. It is a result of incidental learning. Self-concept is an acquired image of the individual.

JUSTIFICATION OF THE STUDY:

For the present investigation variables of Mnemonic Techniques and Self- Concept have been selected to study their effect on Achievement of secondary school students studying through Central Board of Secondary Education (C.B.S.E.), on the basis of earlier considerations the research studies of Brahler and Walker (2008), Hayes (2009), Scruggs et.al. (2010), Laing (2010), Stalder et. al. (2011), Kaldenberg

et. al. (2011), Ruekberg (2011), Carney and Levin (2012), and Karpicke and Smith (2012), which showed a significant effect of Mnemonic Techniques on Achievement.

However researches conducted by Zutaut (2002), and Campos et. al. (2011) could not find any significant relationship between Mnemonics and Achievement.

In addition, one study by Litman and Davachia (2008) showed that Mnemonic Techniques did not enhance immediate memory performance but instead slowed the rate of forgetting.

Researches in the field of Self- Concept (High and Low) of students have shown Self- Concept as a main factor that effect on students' Achievement. It is evidenced by the conclusions of the studies conducted by Sullivan (2009), Graham (2009), Yoshino (2012) which showed a significant effect of Self- Concept on Students' Achievement.

However, researchers like Rogers (2010) and Ahmad and Ghazali (2011) could not find any significant relationship between Self- Concept and Achievement.

In addition, there are studies by Huang (2011) studied moderate relationship and Mcinerney et.al. (2012) reported reciprocal relationship between the Self-Concept and Achievement.

Survey of the related literature, which has been conducted in this field, does not lead to a clear cut trend. The results of these studies present various types of relationships of these variables with Achievement. These studies were showing the effect of variables of Mnemonic Techniques and Self-Concept taken up singly, but the result of studies pertaining to the conjoint effect of both the variables on Achievement may present a different picture. The variable-wise rationale of the problem leaves wide scope for investigating the combined impact of independent variables on dependent variable in different combinations in a factorial frame of reference.

OBJECTIVES OF THE STUDY:

The study was undertaken keeping in view the following objectives:

- 1.To find out the differences on Achievement in respect of High Self Concept and Low Self Concept group students at the secondary stage.
- 2.To work out differences on Achievement in respect of the groups taught through Mnemonic Techniques (With Illustrations and Without Illustrations) and the Control Group of students at the secondary stage.
- 3.To study the interaction effect of variables of Self Concept and Mnemonic Techniques on Achievement.

HYPOTHESES OF THE STUDY:

The study was conducted on the basis of following Hypotheses:

1. There will be no significant difference on the Achievement of High Self Concept and Low Self Concept group students at the secondary stage.
2. There will be no significant difference on the Achievement of the students taught through Mnemonic Techniques With Illustrations, Without Illustrations and the students of the Control Group.
3. There will be no significant interaction effect of the variables of Self Concept and Mnemonic Techniques on Achievement.

DESIGN OF THE STUDY:

The study was designed on the Pre Test – Post Test pattern. The same Achievement test was used at both the levels of Testing. The teaching was done through Mnemonic Techniques With and Without Illustrations.

SAMPLE OF THE STUDY:

A sample pool of 500 students was drawn from the students of class IX of C.B.S.E. affiliated schools of Chandigarh. It consisted of both boys and girls. The sample was random in nature and was drawn from five Senior Secondary Schools of Chandigarh. Technique of multistage sampling was used for collecting the data.

TOOLS USED:

The following tools were used to conduct the present study:

1. Personality word list (PWL) by Partibha Deo (1971) to test the Self- Concept.
2. Mnemonic Techniques with Illustration and without illustration (Developed by the Investigator)
3. Achievement Test for Learning Acquisition (Developed by the Investigator)

DEVELOPMENT OF MNEMONIC TECHNIQUES:

The following steps were involved in the development of Mnemonic Techniques:

Identifying need of the learners'
 Selecting topic for mnemonics
 Identifying pre-requisites and specifying objectives
 Testing the entry behaviour of the learners
 Selecting, analysing and sequencing of content
 Preparing first draft of Mnemonics
 Any change--* Yes / No --* Revision --* Revised & Modified first draft
 Validation by subject experts
 Reliability of Mnemonic Lesson Plans
 Final Lesson Plan based on Mnemonics

DEVELOPMENT OF ACHIEVEMENT TEST:

The test was meant for the students of age group 14 - 16 years studying in class IX in different schools of Chandigarh where the medium of instruction was English. Twelve topics of Social Studies of Class IX were selected for the present study. The achievement test consisting of all multiple choice items related to the selected topics was devised by the investigator keeping in mind the objectives and the content of items. For trying out the preliminary draft, the test was given to a sample of 50 students of class IX. For item analysis Kelley's Method (1939) was adopted to find the Difficulty Value (DV) and Discriminating Power (DP) of preliminary draft. The items having Difficulty Value (DV) ranging from 0.25 to 0.75 and the items ranging from .20 to .90 on the Discriminating Power were retained. As a result of item analysis 23 items were dropped from the achievement test and 15 were modified and finally 137 items were retained out of 160 items in the first draft of the achievement test. These 137 items were taken for the second draft. For trying out the second draft, test was given to a sample of 100 students of Class IX. After item analysis in terms of D.V. and D.P. of the second draft 17 items were dropped from the achievement test and 6 were modified and finally 120 items were retained for Final draft. The reliability of the achievement test of was found by the test-retest method and the reliability coefficient of came out to be 0.73. For validity, content validity of the achievement test was found by relating the content with the objectives.

ANALYSIS AND INTERPRETATION

This phase deals with the analysis of main and interaction effects of the variables. The results of data analysis presented as follows:

Main Effect of Self- Concept

The main effect of Self-Concept was analysed at two levels, High Self-Concept and Low Self- Concept.

Table-1
F- Ratio showing Differences between High and Low Self-Concept Group of Students on Achievement

Self-Concept	No of Cases	Mean	Std. Deviation (SD)	Sum Squares (SS)	df	Mean Square	F-Ratio
High Self - Concept	72	49.7	7.15	655.045	1	655.045	23.74
Low Self- Concept	72	34.9	5.98				

The F- ratio for Self-Concept is significant at .01 level. This implies that the differences between the High and Low groups of Self- Concept are significant on Achievement. The mean value of High Self-Concept group of students (49.7) is higher than that of the mean value of Low Self-Concept group of students (34.9). It clearly shows that High Self-Concept group of students have significantly higher Achievement than that of Low Self-Concept group of students. The comparison of the mean values of High Self-Concept and Low Self- Concept group is shown in Figure - 1

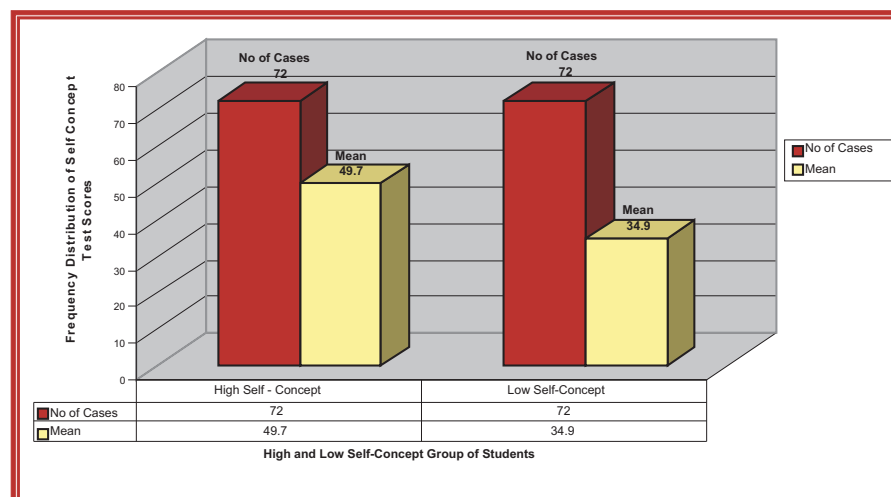


Figure: - 1
Bar Diagram Showing Differences Between High and Low Self-Concept Group of Students on Achievement

Main Effect of Mnemonic Techniques

The main effect of Mnemonic Techniques was analysed over three levels, Mnemonic Techniques with Illustrations (M1), without Illustrations (M2) and the Control Group (M0).

Table-2

F- Ratio showing differences among the groups of Mnemonic Techniques with Illustrations (M1), without Illustrations (M2) and the Control Group (M0) of students on Achievement

Groups	No of Cases	Mean	Std. Deviation (SD)	Sum Squares (SS)	df	Mean Square	F- Ratio
with Illustrations (M1)	48	102.6	26.54	2067.87	2	1033.93	37.48
without Illustrations (M2)	48	79.56	19.36				
Control Group (M0)	48	54.46	11.94				

The F- ratio for the groups of Mnemonic Techniques with Illustrations (M1), Mnemonic Techniques without Illustrations (M2) and Control Group (M0) is significant at .01 level. This implies that the differences among the three groups have significant effect on Achievement of the students. To analyse these differences further t - ratios were computed which are presented in the Table- 3

The comparison of the Mean values of the groups of Mnemonic Techniques with Illustrations (M1), Mnemonic Techniques without Illustrations (M2) and the Control Group (M0) are shown in the Figure- 2

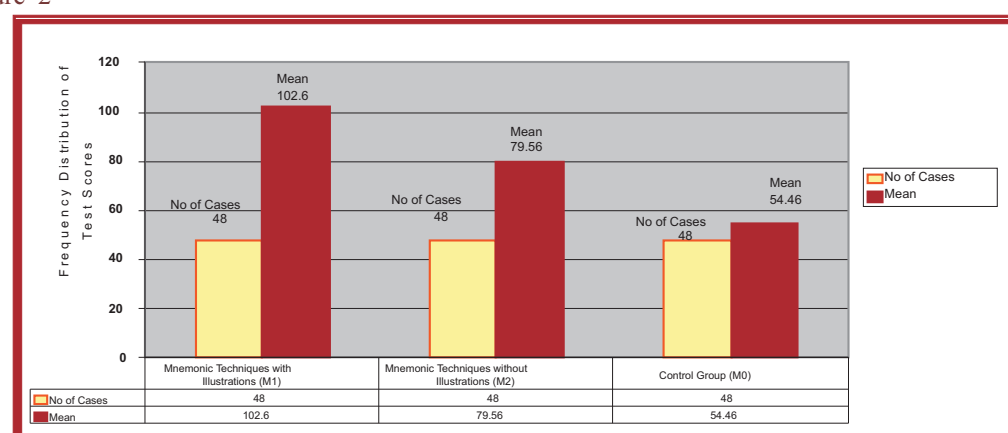


Figure: - 2

Bar diagram showing differences among the groups of Mnemonic Techniques with Illustrations (M1), without Illustrations (M2) and Control Group (M0) on Achievement

Table:-3

t - ratios for the difference in means of two Experimental Groups of Mnemonic Techniques (with Illustrations, without Illustrations) and Control Group of Students

Groups		No of Students	Mean	S.D.	t- ratios	Level of Significance
I	M1	48	94.81	28.46	4.62	* Significant at .01 level
	M2	48	76.85	19.46		
II	M1	48	94.81	28.46	5.97	* Significant at .01 level
	Mo	48	48.32	9.35		
III	M2	48	76.85	19.46	3.68	* Significant at .01 level
	Mo	48	52.32	9.35		

* Significant at .01 level - 2.63 for 94 degree of freedom

** Significant at .05 level - 1.99 for 94 degree of freedom

Groups

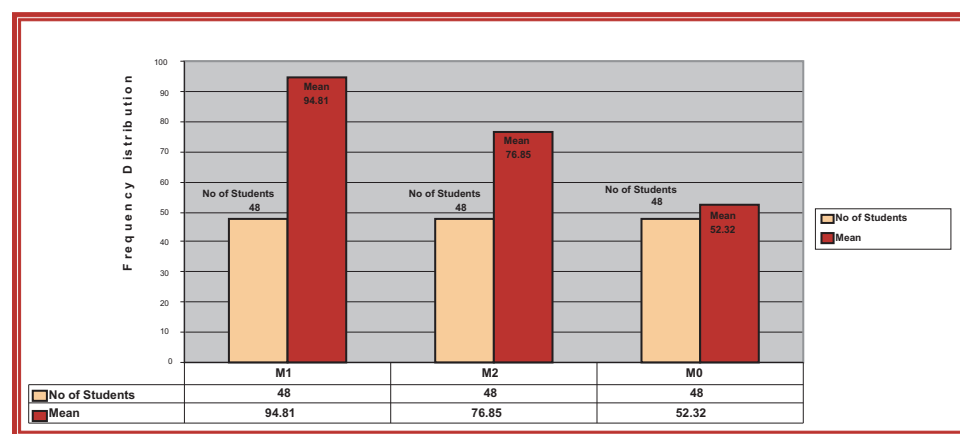
- 1.Mnemonic Techniques with Illustrations (M1)
- 2.Mnemonic Techniques without Illustrations (M2)
- 3.Control Group (No Teaching Mo)

The results of Table- 3 are interpreted as follows:

I. The t- ratio (4.62) between M1 and M2 is significant at .01 level. This implies that the differences between the two of groups of Mnemonic Techniques with Illustrations (M1) and Mnemonic Techniques without Illustrations (M2) are significant. The mean value of students taught through Mnemonic Techniques with Illustrations (94.81) is higher than that of the students taught through Mnemonic Techniques without Illustrations (76.85). It clearly shows that Mnemonic Techniques with Illustrations Group (M1) of students has significantly higher Achievement than that of the group taught through Mnemonic Techniques without Illustrations (M2).

II. The t- ratio (5.97) between Mnemonic Techniques with Illustrations (M1) and Control Group (M0) is significant at .01 level in favour of the group taught through Mnemonic Techniques with Illustrations (Mean 94.81)

III. The t- ratio of 3.68 between the group taught through Mnemonic Techniques without Illustrations (M2) and Control Group (M0) is significant. This shows that Mnemonic Techniques without Illustrations (M2) with the mean of 76.85 is higher than that of the Control Group (M0) with the mean value of 52.32 on Achievement. The comparison of the Mean values of two Experimental Groups and Control Group of Students is shown in Figure:- 3

**Figure: - 3**

Bar diagram showing means of two Experimental Groups of Mnemonic Techniques (with

Illustrations M1, without Illustrations M2) and Control Group (M0) of Students

INTERACTION EFFECTS

The Interaction effects of Self- Concept (S) x Mnemonic Techniques (M) on Achievement is presented in Table - 4 given below.

Table - 4
Interaction Effect Self- Concept X Mnemonic Techniques

Self- Concept x Mnemonic Techniques N = 144				
VARIABLES	SS	df	MS	F-Ratio
Self- Concept x Mnemonic Techniques	714.815	2	357.407	12.958

In the above table the value of SS for Interaction between Self- Concept and Mnemonic Techniques in respect of Achievement is 714.815 and degrees of freedom for interaction are 2. The F - ratio for interaction is 12.958, which is significant at .01 level of confidence. It shows that levels of Self- Concept interact with levels Mnemonic Techniques to produce significant effect on Achievement. To analyse these differences further t - ratios were computed which are presented in the Table- 5

Table: - 5
t- ratios for the effect of Self Concept (S) x Mnemonic Techniques (M) on Achievement

Sr. No	Levels of variables Interaction	Mean	S.D.	t- ratio	Level of Significance
1.	{ S1 M1 S1 M2	64.87	23.94	5.78	* Significant at .01 level
		58.51	19.81		
2.	{ S1 M1 S1 M0	64.87	23.94	10.48	* Significant at .01 level
		50.46	14.16		
3.	{ S1 M1 S2 M1	64.87	23.94	1.85	Not Significant
		63.46	22.61		
4.	{ S1 M1 S2 M2	64.87	23.94	5.12	* Significant at .01 level
		57.73	17.95		
5.	{ S1 M1 S2 M0	64.87	23.94	11.46	* Significant at .01 level
		49.72	12.54		
6.	{ S1 M2 S1 M0	58.51	19.81	6.14	* Significant at .01 level
		50.46	14.16		
7.	{ S1 M2 S2 M1	58.51	19.81	4.74	* Significant at .01 level
		63.46	22.61		
8.	{ S1 M2 S2 M2	58.51	19.81	1.27	Not Significant
		57.73	17.95		
9.	{ S1 M2 S2 M0	58.51	19.81	7.46	* Significant at .01 level
		49.72	12.54		
10.	{ S1 M0 S2 M1	50.46	14.16	9.73	* Significant at .01 level
		63.46	22.61		
11.	{ S1 M0 S2 M2	50.46	14.16	5.98	* Significant at .01 level
		57.73	17.95		
12.	{ S1 M0 S2 M0	50.46	14.16	2.13	Not Significant
		49.72	12.54		
13.	{ S2 M1 S2 M2	63.46	22.61	4.18	* Significant at .01 level
		57.73	17.95		
14.	{ S2 M1 S2 M0	63.46	22.61	10.29	* Significant at .01 level
		49.72	12.54		
15.	{ S2 M2 S2 M0	57.73	17.95	7.43	* Significant at .01 level
		49.72	12.54		

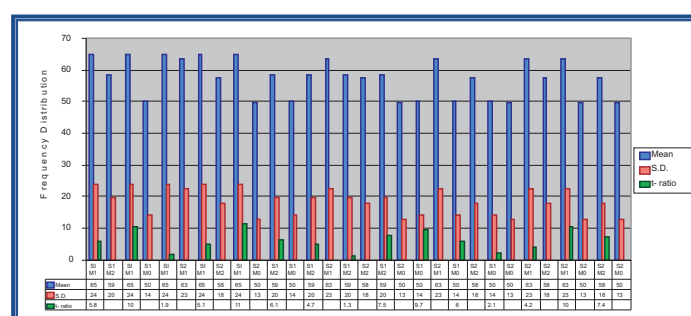


Figure: - 4

Bar Graph Showing Mean, S.D. and t- ratios of Self Concept X Mnemonic Techniques on Achievement

The results of table -5 are interpreted as follows:

- 1.High Self Concept Group of students with Mnemonic Techniques with Illustrations (S1 M1) exhibits higher Achievement than that of High Self Concept Group of students with Mnemonic Techniques without Illustrations Group (S1 M2), since the t-ratio (5.78) is significant at .01 level of confidence.
- 2.High Self Concept Group of students with Mnemonic Techniques with Illustrations (S1 M1) reveals higher Achievement than that of High Self Concept Group of students with Control Group (S1 M0), since the t-ratio (10.48) is significant at .01 level of confidence.
- 3.High Self Concept Group of students with Mnemonic Techniques with Illustrations (S1 M1) and Low Self Concept Group of students with Mnemonic Techniques with Illustrations (S2 M1) show no significant differences on Achievement, since the t-ratio (1.85) is not significant even at .05 level of confidence.
- 4.High Self Concept Group of students with Mnemonic Techniques with Illustrations (S1 M1) exhibits higher Achievement than that of Low Self Concept Group of students with Mnemonic Techniques without Illustrations (S2 M2), since the t-ratio (5.12) is significant at .01 level of confidence.
- 5.High Self Concept Group of students with Mnemonic Techniques with Illustrations (S1 M1) reveals higher Achievement than that of Mnemonic Techniques without Illustrations of students with Control Group (S2 M0), since the t-ratio (11.46) is significant at .01 level of confidence.
- 6.High Self Concept Group of students with Mnemonic Techniques without Illustrations (S1 M2) exhibits higher Achievement than that of High Self Concept Group of students with Control Group (S1 M0), since the t-ratio (6.14) is significant at .01 level of confidence.
- 7.Low Self Concept of students with Mnemonic Techniques with Illustrations (S2 M1) shows higher Achievement than that of High Self Concept Group of students with Mnemonic Techniques without Illustrations (S1 M2), since the t-ratio (4.74) is significant at .01 level of confidence.
- 8.High Self Concept Group of students with Mnemonic Techniques without Illustrations (S1 M2) and Low Self Concept Group of students with Mnemonic Techniques without Illustrations (S2 M2) reveal no significant differences on Achievement, since the t-ratio (1.27) is not significant even at .05 level of confidence.
- 9.High Self Concept Group of students with Mnemonic Techniques without Illustrations (S1 M2) shows higher Achievement than that of Low Self Concept Group of students with Control Group (S2 M0), since the t-ratio (7.46) is significant at .01 level of confidence.
- 10.Low Self Concept Group of students with Mnemonic Techniques with Illustrations (S2 M1) exhibits higher Achievement than that of High Self Concept Group of students with Control Group (S1 M0), since the t-ratio (9.73) is significant at .01 level of confidence.
- 11.Low Self Concept Group of students with Mnemonic Techniques without Illustrations (S2 M2) reveals higher Achievement than that of High Self Concept Group of students with Control Group (S1 M0), since the t-ratio (5.98) is significant at .01 level of confidence.
- 12.High Self Concept Group of students with Control Group (S1 M0) and Low Self Concept Group of students with Control Group (S2 M0) show no significant differences on Achievement, since the t-ratio (2.13) is not significant even at .05 level of confidence.
- 13.Low Self Concept Group of students with Mnemonic Techniques with Illustrations (S2 M1) exhibits higher Achievement than that of Low Self Concept Group of students with Mnemonic Techniques without Illustrations (S2 M2), since the t-ratio (4.18) is significant at .01 level of confidence.
- 14.Low Self Concept Group of students with Mnemonic Techniques with Illustrations (S2 M1) exhibits higher Achievement than that of Low Self Concept Group of students with Control Group (S2 M0), since the t-ratio (10.29) is significant at .01 level of confidence.
- 15.Low Self Concept Group of students with Mnemonic Techniques without Illustrations (S2 M2) reveals higher Achievement than that of Low Self Concept Group of students with Control Group (S2 M0), since the t-ratio (7.43) is significant at .01 level of confidence.

DISCUSSION OF RESULTS:

The results obtained from the analysis of Tables from 1 to 5 are discussed in the context of hypotheses formulated earlier. The results already arrived at by various related studies have also been compared with the results of present study. This has been done to make the study more meaningful.

The First hypothesis of the study states, "There will be no significant difference on the Achievement of High Self Concept and Low Self Concept group students at the secondary stage."

The F- ratio for self-concept vide table no -1 is significant at .01 level. This implies that the differences between the high and low groups of Self- Concept are significant on Achievement. The mean value of high Self- Concept group of students (49.7) is higher than that of the mean value of low self-group of students (34.9).

The results of the present study reveal Higher Achievement of the High Self-Concept group of students than that of the Low Self-Concept group. So, the first hypothesis of the study is rejected.

Research studies by Sullivan (2009), Graham (2009), Yoshino (2012) supported the significant effect of Self-Concept on Achievement.

The second hypothesis of the study states, “There will be no significant difference on the Achievement of the students taught through Mnemonic Techniques With Illustrations, Without Illustrations and the students of the Control Group.”

The F- ratio for Mnemonic Techniques (with Illustrations M1, without Illustrations M2 and Control Group Mo) vide table no - 2 is significant at .01 level. This implies that the differences among the three groups of Mnemonic Techniques with Illustrations M1, Mnemonic Techniques without Illustrations M2 and Control Group Mo are significant with respect to the Achievement of the students. To analyse these differences further t - ratios were also computed and the results indicate the following:

The Achievement of the group taught through Mnemonic Techniques with Illustrations (M1) is better than that of the group taught through Mnemonic Techniques without Illustrations (M2) and also that of the Control Group (M0).

The Achievement of the group taught through Mnemonic Techniques without Illustrations (M2) is higher than that of that of the (M0).

The results of the present study reveal Higher Achievement of the students taught through Mnemonic Techniques with Illustrations (M1) than that of the students taught through Mnemonic Techniques without Illustrations (M2) and that of the students of the Control group (M0). So, the second hypothesis of the study is rejected. The result is supported by research studies of Brahler and Walker (2008), Hayes (2009), Scruggs et.al. (2010), Laing (2010), Stalder et. al. (2011), Kaldenberg et. al. (2011), Ruekberg (2011), Carney and Levin (2012), and Karpicke and Smith (2012) which showed that students taught through Mnemonic Techniques with Illustrations have higher Academic Achievement than that of Mnemonic Techniques without Illustrations and Control Group.

The third hypothesis of the study states, “There will be no significant interaction effect of the variables of Self Concept and Mnemonic Techniques on Achievement”.

The F - ratio for interaction between Self- Concept and Mnemonic Techniques (S x M) is 12.958, which is significant at .01 level of confidence. This shows that levels of Self- Concept interact with the levels of Mnemonic Techniques to produce significant effect on Achievement. Thus, the third hypothesis of the study is rejected.

Educational Implications:

The conclusions of this study may also help the teachers, parents, guidance workers to identify the low achievers, diagnose their problems and provide guidance to improve their performance. The findings of this study have wide implications in enhancing the effectiveness of Mnemonic Techniques in quick and permanent academic achievement of the concepts of social studies, and other school subjects. Mnemonic Techniques have an enormous prospective to be used as alternative instructional strategies for Indian classrooms. The' implications of these results will also encourage the teachers to turn the achievement of the students in the context of their Self-Concept in various school subjects.

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