CHAPTER NO. IV

METHOD AND PROCEDURE
CHAPTER NO. IV

METHOD AND PROCEDURE.

This chapter gives description of method and procedure regarding the design of experiment, sampling, procedure, data gathering, tools, methods to collect data and statistical analysis of data.

4.1 RESEARCH METHOD.

The present study was designed to study the effectiveness of two teaching strategies namely the concept attainment and advance organiser for acquisition of language concepts in relation to their cognitive styles, intelligence and creativity.

The nature of study led the investigator to design an experiment. Pre test, Post test experimental design was employed in this study. The study involved four independent factors namely teaching models, cognitive styles, intelligence and creativity. The dependent variable studied was acquisition of concepts and their retention after one month. All the four independent variables were studied at two levels.

MODELS OF TEACHING.

A1- Concept Attainment Model (CAM)
A2- Advance Organiser Model (AOM)

COGNITIVE STYLE

B1- Field Independent.
B2- Field dependent.
4.2 SAMPLE.

For the present study, the students enrolled in IX class during 1987-88 in different Secondary and Senior Secondary Schools of Chandigarh formed the population. Out of these schools, five schools were randomly selected. Total sample consisted of 288 students. Half of them were randomly assigned to each teaching strategy. The students of Group-I were taught with CAM and Group-II with A.O.M. The break up of sample is given in Table 4.1

<table>
<thead>
<tr>
<th>S.N</th>
<th>Name of the School</th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. High School for boys sector 20-D.</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>2.</td>
<td>Govt. Model High School Sector 20-D.</td>
<td>35</td>
<td>37</td>
</tr>
<tr>
<td>3.</td>
<td>Moti Ram Arya High School, Sector 27</td>
<td>33</td>
<td>19</td>
</tr>
<tr>
<td>5.</td>
<td>Govt. Girls High School Sector 20-B</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>144</td>
<td>144</td>
</tr>
</tbody>
</table>
4.3 DESCRIPTION OF TOOLS.

The following tools were used:

1. Standardized tools.
2. Tool developed by the investigator.

4.3.1 GROUP EMBEDDED FIGURE TEST BY TITCHEN TO IDENTIFY COGNITIVE STYLE.

This test Appendix B.1 was designed by Philip K. Ottman, Evelyn Raskin, & Herman A. Titchen to identify the cognitive style of the students. The test consists of twenty-five items each carrying equal weightage. This is a test of one's ability to find a simple form when it is hidden within a complex pattern. There are three sections in ascending order of difficulty. The first section has seven items and sections two and three have nine items each. This test identifies field-independent and field-dependent students. Thus the cognitive style of the student is identified.

4.3.2 GENERAL MENTAL ABILITY TEST.

Jalota's group test of general mental ability Appendix B.2 was used to measure the intelligence of the sample. The test consists of 100 items pertaining to numerical ability, reasoning, similarities, analogies and language ability. The time limit for this test was twenty
minutes. The author refers to the reliability and its concurrent validity coefficients ranging from 0.50 to 0.78 against the examination marks as criteria. The test was administered and evaluated strictly in accordance with the instructions given in the manual. The raw scores were used to classify the students of each group into two levels, e.g., high level intelligence and low level intelligence.

4.3.3. TORRANCE CREATIVITY TEST

To know the creativity levels of the students, Torrance Creativity Test (Figural and Verbal, Appendix B.3) was administered. Torrance has reported that his Figural and Verbal tests represent a sharp departure from factor type tests developed by Guilford and his associates. The author has made deliberate attempts to construct test activities that are models of the creative process, each involving different kinds of thinking and each containing something unique to the batteries under development. Test tasks or activities are thus fairly complex. The selection of tasks in Figural and Verbal tests was guided by factor analysis of a variety of tasks constructed by the author. To ensure the widest possible coverage, relatively uncorrelated tasks were selected.

Special care has been exercised in construction of Figural and Verbal Tests to make the activities interesting and challenging for individuals at all educational levels.
There are seven activities in Verbal Test and three activities in Figural Test. The Verbal test can be scored for Fluency (Flu.), Flexibility (Flx) and Originality (Org.) and the Figural test for Fluency (Flu.), Flexibility (Flx.), Originality (Org) and Elaboration (E1a). The Figural test is appropriate for use in Kindergarten through graduate school. The verbal test may be used with groups in fourth grade through graduate school and as an individual test in Kindergarten through third grade. The different subtests have different time limit. The author has reported satisfactory split-half reliability coefficients of the test.

4.3.4. ACHIEVEMENT TEST

To measure the achievement of concepts, this test (Appendix A.4) was developed by the investigator. The test consists of one hundred items, each carrying equal weightage. Test was developed to evaluate the student’s knowledge, understanding and application of the concepts of Hindi Language, covered by concepts chosen for the study. First twenty two items of the test were to estimate the knowledge. Next forty eight items were to evaluate understanding and the last thirty were designed to judge the application.
Reliability of this achievement test was also tested by test-retest method.

4.4 DESIGN OF EXPERIMENT.

For conducting the experiment the layout of the scheme was done in the following steps.

**STEP-I.**

The following tests were administered to the entire sample.

1. Achievement Test as a Pre-test.
2. Group Figure Embedded Test to identify cognitive styles of the students.
3. Jaiota Test to measure the intelligence levels of the students.
4. Torrence Tests of Creativity to measure creative levels of the students.

**STEP-II**

Total sample of 288 students was divided equally into two groups by random technique. Each of the two groups were assigned one of the teaching strategy randomly, Group I with C.A.M. and Group II with A.O.M.
STEP III

Group I was taught the concepts of Hindi Language with Concept Attainment Model (C.A.M.) and the same concepts were taught to Group II by A.O.M.

STEP IV

At the end of teaching, Achievement Test was administered again, as a Post Test.

STEP V

After a gap of one month, Achievement Test was again administered to measure Retention.

The complete layout of the experimental procedure is given below.

STAGE I.

<table>
<thead>
<tr>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Achievement test as pre test.</td>
<td>Achievement test as pre test.</td>
</tr>
<tr>
<td>2. Group Figure Embedded Test to identify cognitive styles of students.</td>
<td>Group Figure Embedded Test to identify cognitive styles of students.</td>
</tr>
<tr>
<td>3. Jalota Test to measure the intelligence levels of students.</td>
<td>Jalota Test to measure the intelligence levels of students.</td>
</tr>
<tr>
<td>4. Torrence Tests of creativity to measure creative levels of the students.</td>
<td>Torrence Tests of creativity to measure creative levels of students.</td>
</tr>
</tbody>
</table>
STAGE II
Concepts of Hindi Language were taught through Concepts Attainment Model of Teaching.

STAGE III
Achievement Test was administered as Post Test.

STAGE IV
Achievement Test was again administered after a gap of one month, as Retention Test.

4.5 DATA COLLECTION
With the help of the tests and tools mentioned in the experimental design and procedure above the data were collected. The data yielded the following scores:

- Cognitive style scores- Appendix E.1.1.
- Intelligence scores- Appendix B.2.1.
- Creativity scores- Appendix B.3.1.
4.6 OPERATIONAL DEFINITIONS OF THE TERMS USED IN THE STUDY

4.6.1. COGNITIVE STYLE

Cognitive style was operationally defined as scores obtained by a student, as measured by Wittenberg's Group Figure Embedded Test. High cognitive style group was the group consisting of students who obtained median score or above that score and low cognitive style group having students scoring below the median scores.

4.6.2. INTELLIGENCE LEVEL

Intelligence was operationally defined as scores obtained by a student, as measured by Jalota's Mental Ability Test. High level intelligence group was the group consisting of students who obtained median score or above that score and low level intelligence group having students scoring below the median score.

4.6.3. CREATIVITY LEVEL

Creativity was operationally defined as scores obtained by a student, as measured by Torrence Verbal and Figural tests. High level creativity group was the group consisting of students who obtained median score or above
that score and low level creativity group having students scoring below the median scores.

4.6.4. GAIN SCORES

Gain score is the difference in the scores obtained by a student in the Post test and Pre-test, on Achievement test.

4.6.5. LOSS SCORES

Loss score is the difference in the scores obtained by a student in the Post-test and Retention-test, on Achievement test.

4.7 ANALYSIS OF DATA

The data were organised in tabular form. To interpret data, descriptive statistics such as Mean, Median, skewness, kurtosis etc. were computed. The frequency polygons were drawn to see the normal distribution and shapes of distribution of the different scores. To test the hypotheses fourway analysis of variance was carried out. t-ratios were also computed in all the cases in which F-ratios were significant.