Chapter III
Procedure of the Study
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The purpose of the present study was to examine the effect of Distance Education on the Academic Achievement of Postgraduate students and to study the effects of Cognitive Styles, Self-Concept and Personality Types, independently and collectively in various combinations, on students’ performance. For this purpose, formulation and testing of hypotheses were done. The present chapter discusses the tools, the sample, design of the study, layout of the design, data collection and statistical techniques used.

3.1 DESCRIPTION OF TOOLS

The following tools were used to conduct the present study:

- Group Embedded Figures Test (GEFT) by Witkin, Oltman and Ruskin (1971) to test Cognitive Styles.
- Personality Word List by Pratibha Deo (1971) to test Self-Concept.
- Eysenck’s Moodsley Personality Inventory by Jalota and Kapoor (1966) to test Personality Types.
- Achievement Scores of M.Ed. Examination of Himachal Pradesh University, 1997.

3.1.1 Group Embedded Figures Test (GEFT) by Witkin et al (1971)

Witkin’s Group Embedded Figures Test (GEFT) by Witkin et al (1971) was used to assess broad dimensions of personal functioning which come from Cognitive Styles, include the characteristics, self-consistent modes of functioning which individuals show in their perceptual and intellectual activities.

The GEFT contains three sections, the first section, which contains 7 items, which are very simple, is primarily for practice and not included in scoring. The second and third sections contain 9 difficult items each. The
time limit is 5 minutes each, for the second and third sections. The scoring is done by the total number of simple forms correctly traced in the second and third sections combined. Omitted items are scored as incorrect. The test has a fairly high reliability of 0.82 as shown by Spearman-Brown prophecy formula for both males and females. The raw scores were used to classify the students into two groups, i.e. field-independent and field-dependent. These groups were formed by using the median of the scores obtained on GEFT.

3.1.2 Personality Word List (PWL) by Pratibha Deo(1971)

To measure the Self-Concept of students, Deo’s Personality Word List (1971) was used. It measures ideal self, social self, real self and perceived self. In this study, it measures how the students perceive themselves. This Personality Word List is an outcome of a series of attempts to evolve a suitable Word List. Originally it consisted of 210 adjectives in all. It was first prepared in 1963 and then revised in 1971. The Personality Word List in final version contains 90 adjectives in terms of ‘Words’, both in Hindi and English. However, for the present study its English version was used. It has a five-point scale, the points ranging from “very much like this” to “not at all like this”. This will help the investigator to know the students’ perception of themselves. Adjectives are printed in columns of two, on each side of a card. Instructions are given on the other side of the card.

Reliability of Deo’s Personality Word List was determined in terms of scores on the test over certain specified length of time and consistency of scores of subjects was found out between various administrations of the test. Test-retest coefficient of .86 was obtained for the time interval of one month. Thus, this study establishes a high degree of temporal ability in the self-perception of subjects. The study also establishes a high degree of consistency in the self-perception of subjects on the list over certain specified periods of time.

Overall validity coefficient of scores on Deo’s Personality Word List and Self-Concept List of Deo and Walia (1965) was .56.
The students were given detailed instructions as to how to do the test. They were requested to give the true information and were asked to cooperate with the investigator.

Scoring was done with the help of two separate keys. One for the positive words and second for the negative words. For positive words, the scores were taken as 4,3,2,1 and for negative words 1,2,3,4. Total score was found out by subtracting negative scores from positive scores.

3.1.3 Eysenck’s Maudsley Personality Inventory by Jalota and Kapoor (1966).

English version of Eysenck’s Maudsley Personality Inventory (M.P.I) by Jalota and Kapoor (1966) was used to measure Personality Types. It is brief, easily administrable and scorable inventory, which is designed for assessing neuroticism, stability, introversion and extroversion dimensions of personality. Although, no time limit is enforced in this test but it generally takes 15 to 20 minutes to complete long scale and 3 to 5 minutes for short scale. Each of the questions is to be answered with ‘Yes’ or ‘No’. This test can be used on a group of individuals. The long scale of the test has been used in the present study. The reliability co-efficient, the combined score and standard deviations of long scale for extroversion were 0.42, 27.8 and 6.20. The test was conducted according to the instructions given in the manual of the test. A handmade scoring key was prepared to score the test items. The raw scores itself were used to classify the subjects into extroverts and introverts based on the median of the sample.

3.2 DESIGN OF THE STUDY

Since the purpose of the present study was to find out the effect of three variables viz., Cognitive Styles, Self-Concept and Personality Types on the Academic Achievement of Postgraduate students studying through Distance Education, a factorial design was followed to study the effects of
these three independent variables on the dependent variable of Academic Achievement.

Factorial design is usually employed to study the effect of two or more independent variables operating simultaneously. According to Tuckman (1972), independent variable is that factor, which is measured, manipulated or selected by the experimenter to determine its relationship to an unobserved phenomena. The dependent variable is that factor which is observed and measured to determine the effect of independent variable on it. An independent variable used in the study may either be a treatment variable or a classification variable (Ferguson, 1971).

In the present study, the independent variables are Cognitive Styles, Self-Concept and Personality Types. Sex as a classification variable has also been taken up as an independent variable. The Academic Achievement of the students is a dependent variable.

3.2.1 Dimensions of the Design

The dimensions of a factorial design refer to the number of factors and the number of levels within each factor. The method followed in the present study was based on 2 factorial design. The three factors of Cognitive Styles, Self-Concept and Personality Types were varied at two levels each. The variable of Cognitive Styles was varied at two levels, viz. field-dependent and field-independent, designated as C_1 and C_2. The variable of Self-Concept was studied at two levels, i.e. high Self-Concept and low Self-Concept designated as S_1 and S_2. Similarly, the variable of Personality Types was studied as Introverts and Extroverts, designated as P_1 and P_2.

The 2x2x2 factorial design was replicated 3 times (once for Male students, once for Female students and once for the Total of Male and Female students) for the variables of Cognitive Styles, Self-Concept and Personality Types.
The total number of different combinations came out to be $2 \times 2 \times 2 = 8$ as shown in Table 3.1.

### Table 3.1

<table>
<thead>
<tr>
<th>Cognitive Styles</th>
<th>Self-Concept</th>
<th>Personality Types</th>
<th>Treatment Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_1$</td>
<td>$S_1$</td>
<td>$P_1$</td>
<td>$C_1S_1P_1$</td>
</tr>
<tr>
<td></td>
<td>$S_2$</td>
<td>$P_2$</td>
<td>$C_1S_1P_2$</td>
</tr>
<tr>
<td></td>
<td>$S_1$</td>
<td>$P_1$</td>
<td>$C_1S_2P_1$</td>
</tr>
<tr>
<td></td>
<td>$S_2$</td>
<td>$P_1$</td>
<td>$C_1S_2P_2$</td>
</tr>
<tr>
<td>$C_2$</td>
<td>$S_1$</td>
<td>$P_2$</td>
<td>$C_2S_1P_2$</td>
</tr>
<tr>
<td></td>
<td>$S_2$</td>
<td>$P_1$</td>
<td>$C_2S_2P_1$</td>
</tr>
<tr>
<td></td>
<td>$S_1$</td>
<td>$P_2$</td>
<td>$C_2S_2P_2$</td>
</tr>
<tr>
<td></td>
<td>$S_2$</td>
<td>$P_2$</td>
<td>$C_2S_2P_2$</td>
</tr>
</tbody>
</table>

Total Combinations: 08

### 3.3. SAMPLE

The sample pool for the present study consisted of 1500 M.Ed. students of Himachal Pradesh University studying through Distance Education. It consisted of both male and female students. Accessible population comprised the Postgraduate students of Himachal Pradesh University, Shimla, from centres located in various cities of India, on the basis of random sampling. The sample was selected with an assumption that the
other things being equal, the larger the sample, the greater the precision and accuracy of the data (Mouly, 1964).

The structure of sample in respect of the cities taken for the experiment is presented vide Table 3.2.

**Table 3.2**

Sample Structure

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of the City</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>1.</td>
<td>Jaipur</td>
<td>425</td>
</tr>
<tr>
<td>2.</td>
<td>Chandigarh</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>Udaipur</td>
<td>65</td>
</tr>
<tr>
<td>4.</td>
<td>Shimla</td>
<td>74</td>
</tr>
<tr>
<td>5.</td>
<td>Amritsar</td>
<td>22</td>
</tr>
<tr>
<td>6.</td>
<td>Kota</td>
<td>65</td>
</tr>
<tr>
<td>7.</td>
<td>Jodhpur</td>
<td>42</td>
</tr>
<tr>
<td>8.</td>
<td>Delhi</td>
<td>60</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>778</strong></td>
</tr>
</tbody>
</table>

All the 1500 students were given the tests for Cognitive Styles, Self-Concept and Personality Types. The answer sheets for all were evaluated with the help of respective keys. The raw scores of Cognitive Styles, Self-Concept and Personality Types were taken into consideration for the analysis of results. The entire population of 1500 students was divided into two groups each, on the basis of Cognitive Styles, Self-Concept and Personality Types. Kelley’s (1939) criterion for taking top 27 per cent and bottom 27 per cent was used for dividing the sample pool into two levels each of Cognitive Styles & Self-Concept. The upper 27% group on the basis of Cognitive Styles consisted of 405 students, representing the top group ($C_1$) and the lower group of 27% bottom students also consisted of 405 students, representing the other group ($C_2$).
In the second stage, the further division of these two groups was done on the basis of the two levels of the variable of Self-Concept. Out of \( C_1 \) group, high and low Self-Concept groups were carved out on the basis of Kelley's consideration of top and bottom 27% groups. Similarly, two groups based on Self-Concept were formed out of the \( C_2 \) level of Cognitive Styles. The two levels of Self-Concept were designated as \( S_1 \) and \( S_2 \) standing for high and low Self-Concepts respectively. Four groups, thus formed, were \( C_1S_1, C_1S_2, C_2S_1 \) and \( C_2S_2 \) consisting of 109 students in each category.

In the third stage, further classification of the above four groups was made on the basis of Personality variable, which was taken up at two levels - Introverts and Extroverts. The criterion on which the Introverts and Extroverts were selected, is given below:

- Below \( M - .5 \sigma \) for Introverts,
- Beyond \( M + .5 \sigma \) for Extroverts

Thus, on the above criteria in each of the eight conditions, the sample size came out to be 16, making the total of 128 students of both the sexes. The sample of Male & Female students separately was 56 and 72 respectively.

3.4 Analysis of Variance

The analysis of variance is a method for dividing the variations observed in the data, into different parts, each part assignable to a known source, cause or a factor. We assess the relative magnitude of variation, resulting from different sources and ascertain, whether a particular part of the variation is greater than expectation, under the null hypothesis (Ferguson, 1971). It is mostly used for important and off-encountered problems of determining the significance of the difference among several means. It is a composite test that gives an overall idea about the significance of difference between the means. The main characteristic of this technique is that variance can be simultaneously analysed into two components, the mean of the
variance within group and the variance of the group means. It can also be applied to study the interaction effects.

While analyzing the data, the total sum of squares is broken up into between subjects and within subjects components.

Analysis of variance gives a global picture about the nature of variance. A significant F-value indicates that there are non-chance variations among means, somewhere in the sets. The F-ratio cannot point out which and how many means are significantly different. For this purpose, ‘t’ values are calculated.

The data thus, collected with the help of above-mentioned tools, were subjected to statistical analysis, to find out the nature and direction of variance. It has been discussed in detail in the following chapter.