CHAPTER - III

THE PROBLEM AND PLANNING OF THE EXPERIMENTAL DESIGN

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3.0 **Introduction:**

The falling standards in Education at all levels has become an acute problem for the educationists and planners of Education Policy. The main reasons deterioration of standards are largely attributed to the Students Academic Concern and the level of their Achievement Motivation. Indian Educationists like D.B. Desai, Father Heredero, Prayag Mehta, C.C. Pathak, R.S. Trivedi etc., have come to the conclusion that in Indian Society, especially in its rural segment, achievement motive is low.

Motivation is an internal part of person which raises individual's behaviour. It is not seen directly but can be judged by the performance level of the individuals.

The researches done in the area of achievement motivation reveal that the achievement level of the students could be raised by following a systematic programme. The increase in achievement motivation affects the level of performance of the students, affects the concern of the students. The performance at the examinations generally known as scholastic achievement, depends upon the interest of the individual students and their ability and readiness to do certain tasks. Students having high concern for
academic achievements take interest in all the academic activities, fully and whole heartedly. Thus, all these three seem to be related to each other and hence, the present study was taken up.

3.1 The Problem:

Present study aims at developing the level of Achievement Motivation of students with a view to study its effect on the Academic Concern and scholastic performance of students.

Statement of the Problem:

The problem for the present investigation is:
"A study of the effect of achievement motivation development training on the academic concern and scholastic achievement of high school pupils."

3.2 The Variables under Study:

The problem for the present study is about deciding the efficacy of the achievement motivation training on the academic concern and scholastic performance of students. This suggests that there are two dependent variable: (i) Academic Concern and (ii) Scholastic performance of the students and the training in achievement motivation becomes the experimental variable or the variable to be kept free.
Ultimately it requires an experiment to be conducted in a scientific manner in order to arrive at a reliable conclusion.

3.3 Controlling the independent variables:

In order to decide whether the change in the academic concern of the students and change in their scholastic performance is only due to the training in achievement motivation provided to the students, it becomes inevitable to conduct an experiment controlling the other independent variables affecting the Academic Concern and Scholastic performance of students. But, practically it is almost impossible for a research worker to control all the independent variables as there is a huge list of variables affecting the scholastic performance of students and the Academic Concern of the students. There are some variables related to the teachers, some related to the institutional climate, many related to the students and some related to the students and some related to the task. Hence, it was decided to nullify the effect of only two most prominent variables. They are: (1) JIM and (2) Reasoning Ability.

(1) JIM Scales:

JIM scale is known as Junior Index of Motivation. Junior Index of Motivation provides pupils motivation level.
It shows pupils' motivation towards school. Researches related to JIM suggest that it is highly related to students' school performance and students' attitude towards learning. Students having high level of JIM are having more positive attitude towards learning and hence they perform well on the examination. Hence, it was decided to neutralize or nullify the effect of JIM on the scholastic performance and academic concern of the students so that the pure effect of training in achievement motivation could be studied. The scale consists of eighty alternate response items, and the student has to show his agreement as disagreement with each item.

(ii) **Reasoning Ability:**

Reasoning ability is considered as a crowning achievement of intelligence. Intelligence is positively related to scholastic performance. Hence, it is implied that reasoning ability is positively related to scholastic performance. Reasoning being a super mental ability if it is controlled, it is as good as or perhaps better than controlling the effect of Intelligence. As most of the tests measuring intelligence are made up of reasoning ability tests. Hence, it was decided and thought proper to nullify or neutralize the effect of Reasoning Ability of the students. Reasoning ability being the controlled variable for the present investigation it was necessary to measure reasoning
ability of the pupils. For that purpose a reasoning ability test was administered. It consists of ninety five items divided into six sub-tests.

3.4 Hypotheses:

The following operational hypotheses were formulated with a view to verify them with the help of statistical analysis:

Ho.1: There will not be a significant difference between the mean scores on academic concern of experimental group and controlled group having High Junior Index of Motivation and High Reasoning Ability.

Ho.2: There will not be a significant difference between the mean scores on academic concern of experimental group and controlled group having High Junior Index of Motivation and Low Reasoning Ability.

Ho.3: There will not be a significant difference between the mean scores on academic concern of experimental group and controlled group having Low Junior Index of Motivation and High Reasoning Ability.

Ho.4: There will not be a significant difference between the mean scores on academic concern of experimental group and controlled group having Low Junior Index of Motivation and Low Reasoning Ability.
Ho.5: There will not be a significant difference between the mean scores on scholastic achievement of experimental group and controlled group having High Junior Index of Motivation and High Reasoning Ability.

Ho.6: There will not be a significant difference between the mean scores on scholastic achievement of experimental group and controlled group having High Junior Index of Motivation and Low Reasoning Ability.

Ho.7: There will not be a significant difference between the mean scores on scholastic achievement of experimental group and controlled group having Low Junior Index of Motivation and High Reasoning Ability.

Ho.8: There will not be a significant difference between the mean scores on scholastic achievement of experimental group and controlled group having Low Junior Index of Motivation and Low Reasoning Ability.

3.5 The design of the study:

The investigator needs to select a proper research method to observe facts. If an investigator does mistake in the selection of research design, the observations may not lead to correct conclusions. The present study was based on two independent groups. One of them was given training and the other was not. This type of research
needed an experimental design. The investigator selected a method that leads to comparison between two matched groups, one was given training and the other was not given training in achievement motivation development. It was also expected to have clear indications of between the groups and within the groups comparison, for that purpose the investigator selected an experimental design. Basic experimental designs used in education and the behavioural sciences have been adopted from the physical and biological sciences. Because of the greater difficulties in controlling experimental conditions in the behavioural sciences, the experiment is conducted using only related variables. It makes observation of variables or factors as they exist. The investigator plans in the experiment to study exact relation of one variable with the other. There is some difference between two researchers in their research methods and that is due to control over the variables involved and over the conditions under which the variables are observed. The advantages of making observations under controlled conditions over observations made without such control have been pointed out by Woodworth (1961) thus:

1. The experimenter makes the event happen at a certain time and place and so he is fully prepared to make an accurate observation.
2. Controlled condition being known conditions, the experimenter can set up his experiment and repeat the observation, and another experimenter can replicate them and check the data.

3. The experimenter can systematically vary the conditions and note the concomittant variation in the results.

A variety of experimental designs have been described under different names by different authors; e.g., W.R. Boga and C.V. Good, A.S. Barr and D. Scates mention for educational research the designs such as one. Group Method, Equivalent Group Method, Matched Group, Parallel Group Method, Rotation Group Method etc. A.L. Edwards and W.T. Federer discuss Randomized Groups Design, Randomized Blocks Design, Latin Square Design etc., for psychological investigation.

The investigator decided for the present experiment to adopt Matched Group experimental design. The groups were matched on the bases of JIM and Reasoning Ability Test scores.

It was decided to use pre-test, post-test, Control and Experimental group design. For that it was decided to have Four pairs of Matched groups. One group from each pair was to be considered as experimental one and the other of the same pair as a control group.
Thus there would be four experimental and four controlled groups. The formation of groups was carried out using the scores on Reasoning Ability tests and JIM scales as shown in Fig. 1.

FIG. 1
Diagram showing the details of eight groups for the pupils of Std. VIII. (348 pupils)

In short there were the following groups treated as experimental and control ones:

(1) Two groups having High JIM and (One control and one High Reasoning Ability experimental)
   Group - A : Experimental
   Group - E : Control

(2) Two groups having High JIM and (One control and one Low Reasoning Ability experimental)
   Group - B : as experimental
   Group - F : as control
(3) Two groups having Low JIM and (One control and One High Reasoning Ability experimental
Group - C : as experimental
Group - G : as control

(4) Two groups of Low JIM and Low (One control and One Reasoning Ability experimental)
Group - D : as experimental
Group - H : as control

In the same way formation of groups of the pupils of Std. IX was carried out in a similar manner for replica study. The groups so formed are shown in Fig. 2.

**FIG. 2**

Diagram showing the details of eight groups for Std. IX (329) pupils

To have an experimental design for the pupils of Std. IX, eight groups on the basis of JIM and Reasoning Ability test scores were formed following exactly the method used for Std. VIII.
(1) Two groups having High JIM and High Reasoning Ability (One control and One experimental)

Group - A : Experimental
Group - E : Control

(2) Two groups having High JIM and Low Reasoning Ability (One control and one experimental)

Group - B : as experimental
Group - F : as control

(3) Two groups of Low JIM and High Reasoning Ability (One control and One experimental)

Group - C : as experimental
Group - G : as control

(4) Two groups of Low JIM and Low Reasoning Ability (One control and One experimental)

Group D : as experimental
Group H : as control

The groups so formed were symbolized as $A_1$, $B_1$, $C_1$, $D_1$, $E_1$, $F_1$, $G_1$ and $H_1$.

Scores on JIM scale and Reasoning ability tests were arranged in frequency distribution tables and the necessary statistical calculations were carried out to test the hypotheses.

3.6 The tools used:

The study mainly involved the measurement of academic concern and scholastic achievement of the pupils. At the same time in order to control the variables like reasoning
ability and motivation towards school, measurement of reasoning ability and motivation towards school had to be undertaken. Keeping in mind the purpose of measurement of each of them appropriate tools were selected.

The following tools were employed in the study:

(i) A tool to measure Academic Concern prepared by C.C. Pathak.

(ii) A tool to measure Junior Index of Motivation prepared and standardized by Frymer (1970).

(iii) Reasoning Ability Test constructed and standardized by C.C. Pathak.

(iv) Tests to measure scholastic achievement of the pupils. As no standardized scholastic achievement tests for the students of Gujarat are available, the investigator had no option but to use teacher-made tests for this purpose. Test prepared by 'Sabarkantha Jilla Madhyamic Acharya Sangh' were utilized for this purpose. Tests for the first test and the second test were used for pre-test and post-test respectively.

(i) Academic Concern:

Academic concern is one of the dependent variables for the present study. Academic Concern mainly involves
student's concern about regular attendance in the school, completion of assignments and homework, achievement of better results at examinations, attainment of adjustment with the school environment. The tool used to measure academic concern consists of 66 items which measures concern of the pupils. All the items statements are showing different behaviours involving academic concern. The pupil has to mention to what extent he prefers the behaviour described in each statement. He has to show his preference on a five point scale. If he prefers or likes it most he has to put a mark in the first column and his preference decreases as he puts mark in second, third, fourth or fifth column. The responses have to be converted in numerical scores by assigning five, four, three, two and one score to the marks in the first, second, third, fourth and fifth columns respectively. This test was administered twice on the same sample. Between two administrations of the test the students were given achievement motivation treatment. The scores on first administration and second administration were considered as pre-test scores (X) and post-test scores (Y) respectively. Analysis of co-variance (ANCOVA) technique was employed to study the effect of the treatment given to the pupils. Details are given vide appendix No. 2 and appendix No. 3.

(ii) JIM Scale: Motivation towards school.

It is a tool to measure motivation towards school. It is also known as academic motivation or Junior Index of
Motivation. It measures academic motivation of the pupils.

Junior Index of Motivation consists of eighty items. The pupil has to state whether he agrees or disagrees with the statement. Agreement with fifty items show high motivation and agreement with thirty items show low motivation. JIM scale to measure academic motivation was framed by Frymer (1970).

For JIM scale K.V. Desai (1985) states in his study that:

1. Items were phrased in such a way that they would be at least partially projective in nature.

2. Many items were also phrased with a value hierarchy readily. This technique was designed to require the respondent to make a choice between two alternatives. For instance once such item is 'Being right' is more important than 'being kind'. It was hoped that such phraseology would distill value sentiment to an observable surface.

3. The response to a particular item in a particular way did not indicate a priority direction of students motivation or its degree.

4. Test of reliability of the JIM scale included several administration of the instrument to high school pupils, it was seen that the test
items were fairly consistent among students in high school or the co-efficient of correlation was 0.83. For details about the JIM scale vide appendix Numbers 4, 5 and 6.

(iii) Reasoning Ability Test:

It is a tool to measure reasoning ability. Reasoning ability is a mental ability and hence may influence the academic concern as well as scholastic achievement. So it was decided to control reasoning ability. The test was applied and groups were marched on the basis of its scores.

The test was standardized by C.C. Pathak and is standardized for the pupils of age group 14$^+$ to 17$^+$. It is used here for pupils of Std. VIII and Std. IX as they fall under the prescribed age range. The test includes 95 items. The items are either recall type or multiple choice type items. These items are divided into six sub-tests.

Types of Items: (sub-tests):

1. Word grouping (Multiple)
2. Analogies (Multiple)
3. Perceptual (Multiple)
4. Arithmetical Reasoning (Recall)
5. Factual reasoning (Multiple)
6. Numerical reasoning (Recall)
Details in short of the sub-tests are shown in appendix Numbers 9, 10 and 11.

1. Word grouping:

This type reasoning ability is useful as mental ability to solve logical problem and to measure verbal reasoning. Fourteen items reasoning, four words in each item are similar in term but fifth is not similar in meaning exactly. The pupils have to find out the word that does not belong in the group.

2. Analogies:

It is a sub-test to measure verbal reasoning ability to clear concepts given in words. It is aimed to measure student's ability to abstract or generalize and to think constructively. The analogies form of sub-test items are found to be appropriate for the measurement of reasoning ability by many test constructions. It has eighteen items; two words with one another and a word is alone in first part of the frame. Second part of the frame four words are given. Pupils have to find out related word from these four words to first part frame a single word. Given words are related to various subjects.

3. Perceptual Reasoning:

It is a non-verbal type items sub-test, to measure pupils reasoning ability. It involves the ability to perceive relationships in abstract figure pattern and
generalizations. In the items picture incomplete or cut some part of the picture is given in four parts in front incomplete picture having thirteen items. Pupils have to find out incomplete part out of four.

4. Arithmetical Reasoning:

In this type items sub-test a trick or stratagem to measure pupils ability to reason with arithmetical problems. Here are given fourteen problems items. Pupils have to solve it and find out correct answers from the given form of answers.

5. Factual Reasoning:

The sub-test consists fourteen items just like problem types required to apply pupil's reasoning ability to draw correct conclusions. It is to measure of the pupil's understanding and reasons. The pupils have to find out correct conclusion from given.

6. Numerical Reasoning:

The application of the sub-test is numerical reasoning to measure understanding and numerical relationship, consists twenty two numerical reasoning items purely based on the perception of relation among a group. The pupils read numerical material and calculate the right number of the serial.
Thus the investigator used the tools as described above.

(iv) Scholastic Achievement.

As not a single standardized test to measure scholastic achievement was available, the investigator had to face a great problem. It was considered proper to obtain the test scores for the first and second tests organised by Sabarkantha District Principal's Union. Scores for the first test were considered as the scores on pre-test and those for the second test were considered as post-test scores. The period between two tests was utilized for the experiment, that is to provide the treatment to the pupils. The test scores were analysed using a technique of ANCOVA.

3.7 The sample for the study:

The study was to be made on the pupils of Secondary schools. Therefore, it was decided to conduct an experiment in Std. VIII and IX only as it is almost impossible for the Head Masters of Secondary Schools to spare Std. X for any experiment.

The investigator conducted the experimental work in four different schools of Bhiloda Taluka (Schools A, B, C, D, ...). For the conduct of the experiment it was necessary to form certain groups, so that the effect of certain variables could be controlled i.e., neutralized.
For this (i) Junior Index of motivation to measure motivation towards schools, and (ii) Reasoning ability test to measure reasoning ability were administered over 834 pupils of standard eight and standard ninth from the above mentioned schools of Bhiloda Taluka. On the basis of Junior Index of Motivation and Reasoning ability scores eight groups were formed, for each standard.

Four groups were treated as experimental groups and four groups were treated as controlled groups for both the standards i.e., VIII and IX each having eight groups.

Though the sample initially consisted of 834 pupils of Std. VIII and IX 156 pupils were found irregular during various types of experimental tests, and hence it was not possible to include their data in the experiment. Therefore they were rejected and the sample was reduced to 678. Thus the experiment was conducted on 348 pupils of Std. VIII and 329 pupils of Std. IX.

Though the experiment was conducted over all the 348 pupils of Std. VIII the results of 120 pupils (classified under various groups) were given statistical treatments. This was done with a view to not disturbing the scheduled time-table and the routine of the schools under-study. The classes as such were not disturbed but, the results of pupils under the experiment were considered.
3.8 **The Statistical Techniques:**

In any investigation the data collected have to be analysed using proper statistical techniques in order to reach the correct conclusions. The present investigation included experimental design and it was intended to study the effect of the treatment on the experimental group. It was intended to see whether significant difference is found due to the treatment. As the groups were not marched on the dependent variables under study it was found appropriate to use the technique of Analysis of co-variance (ANCOVA) for the analysis of the data collected for the present investigation.

3.8.1. Technique of Analysis of Co-variance (ANCOVA):

According to Garrett (1960) the technique of analysis of co-variance takes into consideration the initial performance \( (X) \) as a pre-test of the group before treatment or training and final performance \( (Y) \) as a post-test treatment or training. In the present research work the technique of ANCOVA was employed to study the difference between the mean scores obtained on scholastic performance of students before and after the treatment and to study the difference between mean scores on Academic Concern before and after the treatment. It was also useful to study the difference between the mean scores of the controlled groups and
experimental groups. F-test was applied to check the significance of differences.

\[
F = \frac{(\text{Mean adjusted}) \text{ Mean sum of squares for component or between group variance}}{(\text{Mean adjusted}) \text{ Mean sum of squares for error or within group variance}}
\]

\[
= \frac{\text{Mss}_A \text{ Between group}}{\text{Mss}_B \text{ Within group}}
\]

The obtained F-value is compared with the tabulated F-value as chosen level of confidence for df = (t-1) for between groups and (N-(t-1)) for within group, where 't' is the number of subjects in each group. Further, F-test is used to test the overall significance of difference of means between groups usually for two groups or more than two groups. If 'F' is found significant; it shows that there is an overall significant difference between the treatments.

3.8.2. Computation of Analysis of Co-variance Technique (ANCOVA):

The process for analysis of co-variance technique H.E. Garrett (1979) has suggested the steps for the computation of ANCOVA.

Step - 1: Summate all scores (i.e., X and Y) under each subgroup as well as group i.e., find out the value of \( \bar{X}_1; \bar{X}_2; \bar{X}_3; \bar{X}_4; \bar{X}_5; \bar{X}_6; \bar{X}_7; \bar{X}_8; \)

\( \bar{Y}_1; \bar{Y}_2; \bar{Y}_3; \bar{Y}_4; \bar{Y}_5; \bar{Y}_6; \bar{Y}_7; \bar{Y}_8; \)

\( \bar{X}_1; \bar{X}_2; \bar{X}_3; \bar{X}_4; \bar{X}_5; \bar{X}_6; \bar{X}_7; \bar{X}_8; \)

\( 8_{xy1}; 8_{xy2}; 8_{xy3}; 8_{xy4}; 8_{xy5}; 8_{xy6}; 8_{xy7}; 8_{xy8}; \)

and \( 8_{xt}; 8_{yt}; 8_{xyt}. \)
Step - 2: Square each scores (i.e., X and Y) and summate all those i.e., find out:

(a) $\xi x^2 t = \xi x^2_1 + \xi x^2_2 + \xi x^2_3 + \xi x^2_4 + \xi x^2_5 + \xi x^2_6$
   $+ \xi x^2_7 + \xi x^2_8$

(b) $\xi y^2 t = \xi y^2_1 + \xi y^2_2 + \xi y^2_3 + \xi y^2_4 + \xi y^2_5 + \xi y^2_6$
   $+ \xi y^2_7 + \xi y^2_8$

(c) $\xi xy^2 t = \xi xy^2_1 + \xi xy^2_2 + \xi xy^2_3 + \xi xy^2_4 + \xi xy^2_5$
   $+ \xi y^2_6 + \xi y^2_7 + \xi y^2_8$

X = Score on present (Pre-test)
Y = Score on present (Post-test)

Step - 3: Correction factor for x, y and xy

(1) $C_x = \text{Correction factor for x}$

$$C_x = \frac{(\xi xt)^2}{N} \quad N = 120$$

(2) $C_y = \text{Correction factor for y}$

$$C_y = \frac{(\xi yt)^2}{N} \quad N = 120$$

(3) $C_{xy} = \text{Correction factor for xy}:$

$$\xi xy = \frac{(\xi xyt)^2}{N} \quad N = 120$$

$$= \frac{\xi xt \cdot \xi yt}{N}$$
Step - 4: Compute the difference sums of squares as below:
Total SS (Sum of squares) for x, y and xy:

1. \( SS_T(x) = \varepsilon_x^2 - C_x \)
2. \( SS_T(y) = \varepsilon_y^2 - C_y \)
3. \( SS_T(xy) = \varepsilon_{xy} - C_{xy} \)

Step - 5: Compute the difference sums of squares as below:

SS between groups for x, y and xy:

1. \( SS_{b(x)} = \frac{(\varepsilon_{x1})^2}{N_1} + \frac{(\varepsilon_{x2})^2}{N_2} + \frac{(\varepsilon_{x3})^2}{N_3} + \frac{(\varepsilon_{x4})^2}{N_4} + \frac{(\varepsilon_{x5})^2}{N_5} + \frac{(\varepsilon_{x6})^2}{N_6} + \frac{(\varepsilon_{x7})^2}{N_7} + \frac{(\varepsilon_{x8})^2}{N_8} - C_x \)

2. \( SS_{b(y)} = \frac{(\varepsilon_{y1})^2}{N_1} + \frac{(\varepsilon_{y2})^2}{N_2} + \frac{(\varepsilon_{y3})^2}{N_3} + \frac{(\varepsilon_{y4})^2}{N_4} + \frac{(\varepsilon_{y5})^2}{N_5} + \frac{(\varepsilon_{y6})^2}{N_6} + \frac{(\varepsilon_{y7})^2}{N_7} + \frac{(\varepsilon_{y8})^2}{N_8} - C_y \)

3. \( SS_{b(xy)} = \frac{\varepsilon_{x1} \cdot \varepsilon_{y1}}{N_1} + \frac{\varepsilon_{x2} \cdot \varepsilon_{y2}}{N_2} + \frac{\varepsilon_{x3} \cdot \varepsilon_{y3}}{N_3} + \frac{\varepsilon_{x4} \cdot \varepsilon_{y4}}{N_4} + \frac{\varepsilon_{x5} \cdot \varepsilon_{y5}}{N_5} + \frac{\varepsilon_{x6} \cdot \varepsilon_{y6}}{N_6} + \frac{\varepsilon_{x7} \cdot \varepsilon_{y7}}{N_7} + \frac{\varepsilon_{x8} \cdot \varepsilon_{y8}}{N_8} - C_{xy} \)
Step - 6: SS within the groups for x, y and xy:

(1) $SS_w(x) = SST(x) - SS_b(x)$
(2) $SS_w(y) = SST(y) - SS_b(y)$
(3) $SS_w(xy) = SST(xy) - SS_b(xy)$

Step - 7: Compute Adjusted SS for Y:

(1) $SS_T'(y) = SS_T(y) - \frac{SS_T(xy)^2}{SS_T(x)}$
(2) $SS_w'(y) = SS_w(y) - \frac{SS_w(xy)^2}{SS_w(x)}$
(3) $SS_b'(y) = SS_T(y) - SS_w'(y)$

Step - 8: Adjusted Y means

$b$ within $= \frac{SS_w(xy)}{SS_w(x)}$

$GM_x$ (General Mean for X)

$GM_x = \frac{\sum x}{N}$

$M_{y.x}$ (Adjusted Mean for Y)

$M_{y.x} = M_y - b (M_x - GM_x)$

$M_y = \text{Mean of } Y$
$M_x = \text{Mean of } X$.  

The calculation is to like above find out all for eight groups adjusted means.

Step - 9: Significance of difference among adjusted Y means:

\[ S.D_{y.x} = \sqrt{M_s'(y)} \text{ (within)} \]

\[ S.E.M_{y.x} = \frac{S.D_{y.x}}{\sqrt{n_1}} \]

Step - 10: \( S.E.D_{y.x} \) between any two adjusted means

\[ S.E.D. = S.D_{y.x} \sqrt{\frac{1}{N_1} + \frac{1}{N_2}} \]

Step - 11: Significance difference:

\[ \text{Sig. diff.} = S.E.D_{x} \text{ value of } t \text{ at 0.06 level} \]

and \( S.E.D_{x} \) value of \( t \) at 0.01 level.

The results be placed according to Table No. III-1 and III-2.
### Table No. III-1

**ANALYSIS OF CO-VARIANCE (ANCOVA)**

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
<th>Group 7</th>
<th>Group 8</th>
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<tr>
<td>Pre-test ($\hat{z}_x$)</td>
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<td>$\hat{z}_{x3}$</td>
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<td>$\hat{z}_{xy8}$</td>
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<tr>
<td>N (120)</td>
<td>15$n_1$</td>
<td>15$n_2$</td>
<td>15$n_3$</td>
<td>15$n_4$</td>
<td>15$n_5$</td>
<td>15$n_6$</td>
<td>15$n_7$</td>
<td>15$n_8$</td>
</tr>
</tbody>
</table>

From this the summary can be extracted. A table of summary of results of analysis of Co-variance can be indicated as shown in table No. III-2.
### Table No. III-2

**SUMMARY OF RESULTS OF ANCOVA**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>df</th>
<th>SS(x))</th>
<th>SS(y))</th>
<th>SS((xy))</th>
<th>SS(_b')(y))</th>
<th>df</th>
<th>M(_{b'})(y)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatments</td>
<td>t-1</td>
<td>SS(_b)(x))</td>
<td>SS(_b)(y))</td>
<td>SS(_b)(xy))</td>
<td>SS(_b')(y))</td>
<td>t-1</td>
<td>(\frac{SS(_b')(y))}{t}) = A = (A/B = F)</td>
<td></td>
</tr>
<tr>
<td>Within groups</td>
<td>N-t</td>
<td>SS(_w)(x))</td>
<td>SS(_w)(y))</td>
<td>SS(_w)(xy))</td>
<td>SS(_w')(y))</td>
<td>N-(t-1)</td>
<td>(\frac{SS(_w')(y))}{N-(t+1)}) = B</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>N-1</td>
<td>SS(_T)(x))</td>
<td>SS(_T)(y))</td>
<td>SS(_T)(xy))</td>
<td>SS(_T')(y))</td>
<td>N-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source of variation:**

- Between Treatments
- Within groups
- Total
3.9 **Training in Achievement Motivation Development**

**Time Schedule:**

The experimental programme was conducted keeping in mind the time-schedule as follows:

<table>
<thead>
<tr>
<th>Month of December, 1986</th>
<th>Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>First week - Ring Toss</td>
<td>5</td>
</tr>
<tr>
<td>- Who am I ....?</td>
<td>4</td>
</tr>
<tr>
<td>Second week - I and My School</td>
<td>2</td>
</tr>
<tr>
<td>- What I Like to be</td>
<td>2</td>
</tr>
<tr>
<td>- If I am a .......</td>
<td>2</td>
</tr>
<tr>
<td>Third week - Praise stair</td>
<td>2</td>
</tr>
<tr>
<td>- My Leisure time</td>
<td>2</td>
</tr>
<tr>
<td>- My aim</td>
<td>2</td>
</tr>
<tr>
<td>Fourth week - My Motivation force</td>
<td>2</td>
</tr>
<tr>
<td>- My Energy force bridge</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total periods**: 25

The detailed discussion and description of the programme is described in the next chapter to follow.