"An individual's personality is his unique pattern of traits. A trait is any distinguishable, relatively enduring way in which one individual differs from others."

- Guilford-1959
CHAPTER : V

RESEARCH DESIGN AND EXECUTION

CONTENTS

5.1 INTRODUCTION

5.2 BASIC ELEMENTS OF RESEARCH METHOD
  5.2.1 Variables Therein
  5.2.2 Hypotheses Built
  5.2.3 Tools Used
    5.2.3.1 Creative Ability Test (CAT)
    5.2.3.2 Creative Thinking Programme (CTP)
    5.2.3.3 Desai Verbal and Non-verbal group intelligence test
    5.2.3.4 Desai Verbal and Non-verbal group intelligence test - A manual
    5.2.3.5 Scoring of Desai Verbal and Non-Verbal group intelligence test.
    5.2.3.6 Sex
  5.2.4 Sample Selection
  5.2.5 Population

5.3 STATISTICAL TECHNIQUES : EXPERIMENTAL DESIGN :
  5.3.1 Types of Design
    5.3.1.1 Single group design
    5.3.1.2 Separate Control Group Designs
  5.3.2 ANOVA : A Factorial Experiment
  5.3.3 Statistical Technique in ANOVA

5.4 EXECUTION OF CREATIVE THINKING PROGRAMME
  5.4.1 Familiarisation with Programme
    5.4.1.1 Instructions
    5.4.1.2 Time Schedule
    5.4.1.3 Format of the Programme
  5.4.2 Experimental Work Done
  5.4.3 Response Analysis
  5.4.4 Observation

5.5 RESUME

5.6 REFERENCES
CHAPTER: V
RESEARCH DESIGN AND EXECUTION

5.1 INTRODUCTION:-

Research design is a strategy on paper like an architect's plan. Certain fundamental steps of research design must be given due importance when purposed to be used. The operation of the design, that is planning must be carried out with patience and accuracy.

The first phase the study i.e. development of divergent thinking programme have been described in the forgoing chapter. This chapter deals with the description of the second phase of the study, i.e. implementation of creative thinking programme and to study its effect on the creativity and creative ability of secondary school students of standard IX of Mehsana District.

For validational study the following design was completed with the research tools and sampling procedure.

5.2 BASIC ELEMENTS OF RESEARCH METHOD :-

As described Chapter-IV, this chapter deals with the 'put in practice' the four basic requirements in research method, viz: Variables, Hypothesis, Research tools and sample selection.

5.2.1 Variables Therein :-

Although, the research studies have, in general, supported the effectiveness of special programmes for creativity viz. purdue creative Thinking programmes, productive thinking programme, for the creativity of the school children. But very few attempts have been done in enhancing the creativity of pupils through creative thinking programmes based on the academic subject taught usually in school. Even then there are several major unsolved problems containing their creativity of the students.
B.K. Passi, in his talk "All India Seminar on Creativity" held at Regional College of Education, Bhopal (1982) has stated the need of such programmes and its way of implementation to look after the creativity of the secondary school students. So generalisation has decided to take the treatment as one of the independent variable.

As described in the review chapter III, intelligence to be an effective variables in nurturing and audiencing the creativity levels of the secondary school students. To study the effect of these creative thinking programme the investigator has kept in view the pre-acquired creativity level of the students, so the pre-acquired creativity ability is also considered in the independent variable for this study.

The four variables and the levels of which they operate in the present study are shown in the following table.

**TABLE NO : 5.1**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Variable</th>
<th>Nature of the Variable</th>
<th>No. of Levels</th>
<th>No.</th>
<th>Name of Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Treatment</td>
<td>Independent</td>
<td>3</td>
<td>1</td>
<td>Programme with feedback</td>
</tr>
<tr>
<td></td>
<td>Creative Thinking</td>
<td></td>
<td></td>
<td>2</td>
<td>Programme without feed back</td>
</tr>
<tr>
<td></td>
<td>Programme</td>
<td></td>
<td></td>
<td>3</td>
<td>No Programme</td>
</tr>
<tr>
<td>2.</td>
<td>Intelligence</td>
<td>Independent</td>
<td>2</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Low</td>
</tr>
<tr>
<td>3.</td>
<td>Sex</td>
<td>Independent</td>
<td>2</td>
<td>1</td>
<td>Boys</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Girls</td>
</tr>
</tbody>
</table>
Dependent Variable :-

The dependent variable will be creativity score obtained by pupils after taking creative ability test developed by J.Z. Patel.

The three levels treatment viz:

(1) Execution of creative thinking programme developed by the investigator and discussion along with the proper feedback.

(2) Execution of creative thinking programme developed by the investigator without any feedback or discussion.

(3) No programme should be executed. The natural creativity should be measured by pre-acquired, creativity level.

The variables as per the description above incorporated in the study paved way to the formation of the hypotheses that were really to be tested after the data collection.

5.2.2 Hypotheses Built :-

The hypothesis formulated for this present study are mentioned below:

H₁ : There is a significant effect of creative thinking programme with feedback on the creative ability of the students of Std. IX of Mehsana District.

H₂ : There is a significant effect of creative thinking programme without feedback on the creative ability of the students of Std. IX of Mehsana District.

H₃ : There is a significant effect of creative thinking programme processing intelligence on the creative ability of the students of Std. IX of Mehsana District.

H₄ : There is a significant effect to creative thinking programme possessing sex on creative ability of the students of Std IX of Mehsana District.

H₀ : There is no first order interaction effect of treatment of creative thinking programme with feedback and intelligence on the creative thinking
of the students of std IX of Mehsana District.

H_{06} : There is no first order interaction effect of treatment of creative thinking programme with feedback and sex on the creative ability of the students of std IX of Mehsana District.

H_{07} : There is no first order interaction effect of treatment of creative thinking programme without feedback and intelligence on creative ability of the students of std IX of Mehsana District.

H_{08} : There is no first order interaction effect of treatment of creative thinking programme without feedback and sex on the creative ability of the students of std IX of Mehsana District.

H_{09} : There is no first order interaction effect of intelligence and sex on the creative ability of the students of std IX of Mehsana District.

H_{10} : There is no second order interaction effect of treatment with feedback intelligence and sex on creative ability of the students of std IX of Mehsana District.

H_{11} : There is no second order interaction effect of treatment without feedback intelligence and sex on the creative ability of the students of std IX of Mehsana District.
5.2.3 Tools used:
The following were the main tools which were used to observe the data for this study.

**TABLE NO. 5.2**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the tool.</th>
<th>Author.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Creative Ability test (CAT)</td>
<td>J.Z. Patel</td>
</tr>
<tr>
<td>2</td>
<td>Creative Thinking Programme (CTP)</td>
<td>Prepared and developed by the investigator.</td>
</tr>
<tr>
<td>3</td>
<td>Desai verbal and non verbal group intelligence test</td>
<td>K.G. Desai</td>
</tr>
</tbody>
</table>

5.2.3.1 **Creative Ability Test (CAT)**

Introduction:

J.Z. Patel has done prominent work in Education, specially for measurement of creative ability of the students of secondary school. J.Z. Patel was formally a reader in Post Graduate Department of Education in Sardar Patel University, Vallabh Vidyanagar. J.Z. Patel prepared and developed creative ability test and standardized on the population all over Gujarat taking the sample of students of 1500. Then J.Z. Patel established the norms of validity and reliability of the test. J.Z. Patel prepared a manual for the procedure of the test.

It is indeed very popular to measure creative ability of the students of secondary school.

The investigator determined and considered creative ability test (CAT) for measuring creative ability of secondary school students as a tool for the present study.
Content of creative ability Test (CAT) is described as under:

This is classified in three sections, as shown below:

Section-1 : Verbal Creative ability test.
Section-2 : Figural Creative ability test.
Section-3 : Numerical Creative Ability test.

The question of every section is followed by the instruction given with illustrations.

* In Verbal Creative Ability Test there are two subparts:
  (a) Instances
  (b) Uses

Each sub-part consists two questions.

* In figural creative ability test there are two subparts:
  (a) Line meaning
  (b) Pattern meaning

These two sub-parts also consist two figures in each.

* In Numerical creative ability test, there are two sub-parts:
  (a) Numerical
  (b) Operations

These two sub-parts consist only one question in each, thus the whole test consists of ten questions.

Description of CAT :-

The CAT is classified as above. For each test, five minutes time limit is given for each question, so fifty minutes time is required for the completion of CAT. The test reliability was found by test-retest and split-half method. The sub test scores vary from 0.73 to 0.93 and 0.77 to 0.90 respectively and factor scores vary from 0.86 to 0.94 and 0.82 to 0.90 respectively. The Concurrent Validity of CAT with different criteria measures varies from 0.66 to 0.77.
Scoring of CAT :-

As there is no right or wrong responses for the test, much can be exercised at the time of scoring. The scorer has to acquaint himself fully with the method of scoring and the use of scoring sheet. The following points had been kept in mind while scoring the test.

Each test item is to be scored for Fluency, Flexibility and Originality Score. The total of these component scores become the creativity score for each item. Then the total of all the items scores become the total Creativity Score of the testee.

In Score for fluency the investigator has gone through the responses to item in question carefully and struck off those which were irrelevant and or has been responded. Then he counted the remaining number of responses and entered that number as a fluency score, for the item, in the appropriate box on the answer sheet.

In scoring for flexibility, the investigator first acquainted himself with the categories of responses given for each item in the scoring Guide. For the shake of convenience he noted bracket against each response. The alphabetic serial of the category to which it belongs whenever he came across a response which has not been mentioned in scoring guide, he had determined the category to which it would seem to belong.

When the response belongs to an entirely new category not considered in the scoring guide he had given it a new alphabetic serial and noted in the bracket against the response in question. After he had gone through all the responses to a given item, he counted the number of different categories used by the testee. This could be easily determined on the basis of the number of different alphabetic serials used. Then he counted the total number of different alphabet serial used and entered that number as the Flexibility score for the item in
the appropriate box on the answersheet.

In scoring for originality, the investigator had strictly followed the scoring guide. Every original responses such as mentioned in the scoring guide with underline were given one score of originality to each. When he came across such responses which were not mentioned in the scoring guide, he had briefly noted down them on the back side of the answersheet and after all the test scripts had been scored, he had decided on the basis of statistical scheme which of those was unique response and which was not, and categories for such new responses were also determined at the time of scoring and then added those scores by putting (+) sign in the appropriate box where he had already noted the originality score based on the responses given in the scoring guide. The copies of creative ability test in detail are shown in Appendix No: 7.

5.2.3.2 Creative Thinking Programme (CTP)

Creative thinking programme is an enhance of the creativity of pupils.

The CTP series is essentially based on conceptual thoughts and certain situation. The content of CTP is explained in detail in chapter III.

Through this study, the students of secondary school may think thoroughly on conceptual thoughts and situation. The main objective of this study is to make them think between the relation of situation and human activities that are interesting and noble. The children are expected to become more proficient in doing activities as the series of the programme progresses. The copies of all thirty lessons in details are shown in Appendix-2.

Each programme is followed by its activities PTA. There are eight activities in first programme and there are four activities in second and third programme, which may take about 45 minutes.
including suggestions. Investigator puts initiated limited content in the starting in each and every programme. The first, second and fifth activities are quite easy but third and fourth are quite difficult because it is of divergent thinking type. In each programme, activities are given equal importance. Some are more complex and more closely related to our life and observation. Considerable effort has been made to develop or to keep the PTA. The copies of final creative thinking programme in detail are shown in Appendix No: 2

5.2.3.3 Desai verbal and non verbal group intelligence test:

INTRODUCTION:

K.G. Desai has done an important work in Education specially for measurement of intelligence. K.G. Desai, was formally a principal of A.G. Teacher's college, Ahmedabad. Meanwhile C.L. Bhatt also, was serving in A.G. Teachers' college, Ahmedabad as a Lecturer. They have enough experience in the field of education. They meet together and prepared group intelligence test, in 1956.

They developed it and standardized on the population of all over gujarat taking the sample of students 1000. They already established the norms of validity and reliability of test. They prepared a manual for the procedure of the test. This test is known as "Desai and Bhatt verbal group intelligence test."

After two decades K.G. Desai prepared and developed verbal and non verbal group intelligence test. The verbal and non verbal group intelligence test standardized on the population of all over Gujarat taking the sample of students of 1500. K.G. Desai already established the norms of validity and reliability of the test. K.G. Desai also prepared a manual for the procedure of the test. This test is known as "Desai verbal and non verbal group intelligence test." It is indeed very popular
to measure, the intelligence of the secondary school students.

The investigator considered Desai verbal and verbal group intelligence test for measuring the intelligence of secondary school students as a tool for the present study.

Content of Desai verbal and non-verbal group intelligence test is described as under:

Desai verbal and non-verbal group intelligence test involves the following creativity tests.

1. Verbal creative ability test.
2. Figural creative ability test.

The question of every creative ability test is followed by the instructions given with illustrations.

1. In Verbal creative ability test there are following three sub-parts.
   (a) Instances
   (b) Uses
   (c) Relation with the other object.

   The total questions of verbal creative ability test are 33.

2. In Figural creative ability test there are following three sub-parts.
   (a) Line meaning
   (b) Pattern meaning
   (c) Complete figure meaning

   The total questions of figural creative ability test are 44.

3. In Numerical creative ability test there are following three sub-parts.
   (a) Numerical
   (b) Operations
   (c) Sequences.
This Numerical creative ability test consists of 11 questions.

The copies of Desai verbal and non-verbal group intelligence test in detail are shown in Appendix No: 4.

5.2.3.4 Desai Verbal and non-verbal group intelligence test - A manual.

Desai Verbal and non-verbal group intelligence test is a standardized test in Gujarat. It is very popular in the field of measuring group intelligence in secondary school students of standard IX. This test is developed by K.G. Desai.

Desai prepared a manual of Desai Verbal and non-verbal group intelligence test. It involved the execution of test, time schedule, scoring key of the test, and establishment of norms of the test.

A copy of manual of Desai Verbal and non verbal group intelligence test in detail is shown in Appendix No:6.

5.2.3.5 Scoring of Desai Verbal and non-verbal group intelligence test.

Desai Verbal and non-verbal group intelligence test has its own specific answer sheet.

There are given in first some instructions to the students to give answers properly in the given answer sheet. There are five powerful options to the question. The students are requested to give their first preference by drawing a circle around the correct option.

A copy of answer - sheet of Desai Verbal and non verbal group intelligence test in detail is shown in Appendix No:5.

5.2.3.6 Sex:

Sex is an important variable affecting to the development of creative ability of the children. Sometimes boys' group of students of the secondary school are getting remarkable achievement rather than the girls' group of students of secondary school. Hence in this study
the investigator desires to measure the significant role of Sex, in the development of creative ability of the students of Standard IX in Mehsana District.

The information regarding the variables sex, class, locality, and region were collected by giving personal data sheet.

Co build (1990) defines the term 'sex' as: "The two sexes are the two groups males and female, into which people and other living things are divided according to the function they have in producing young."

Webster (1987) says "The sum of characteristic structures and functions by which an animal or plant is classified as male or female."

In this research sex means.
(I) Male (boys) and
(II) Female (girls).

Sex is generally identified naturally at the time of their birth. This is quite natural that the society is divided in the two groups according to sex. In this study it is obvious that students studying in the IX standard broadly divided in the two groups:
(1) Boys
(2) Girls

5.2.4 Sample Selection:

It is very difficult to work on the total population for any research, as the factor like time energy, finance etc. are limited. Sometimes experimental design also puts restriction on the sample selection. Owing to these limitations it was decided to work on a sample for the present study. Sampling is a process of selection of subjects. The purpose of sampling is to study a small group i.e. assumed to be representative of the large group population from which it is drawn. According to Borg 1
"The factor that must often differentiate between good and poor research is not the fund available the size of the sample or the sophistication of the statistics it is cure and thought that goes into research plan."

Now it is worth to fix the size of sample before selecting the sample for the study. Edward de Bono opine

"There is no ideal size. Twelve people are a convenient number but a brainstorming session can work very well with as many as fifteen or as sixteen."

This study concludes experiment method. It is the most exacting and difficult to all methods and also important from the scientific point of view. But the experimental method restricts the sample size as the programme are to be put on Anvil to study its effect.

Scoring procedures may be of various types among which the following classification is specific and useful too.

(1) Random Sampling
(2) Startified Sampling
(3) Quota Sampling
(4) Multi-Stage Sampling
(5) Systematic Sampling
(6) Cluster Sampling
(7) Purposive Sampling

From these types, the investigator had to select such a sample, which would satisfy the following characteristics.

(a) In general, creativity of students should normally be distributed.
(b) Socio-economically the students should be from affluent group.
(c) The school should be known to the experimenter for easy approach and full co-operation of the students as well as the staff.
(d) The school should have co-educational system.
(e) The school should have at least three classes of Std. IX to compare three treatments to be implemented.

Looking to the above requirements, the investigator selected the purposive sampling technique for this study. In most general sense, it means selection according to some purposive principles. Claims have been made that this method gives "More representative than an objective method."

Garrett says:
"A purposive sample may be expressly chosen, because in the light of available evidence, it mirrors some larger group with reference to given clarification."

A school satisfying all the requisite conditions named P.H.D. Vidya Vihar Higher Secondary School, Valam, Di: Mehsana for the purpose. There were four classes of Std. IX. As per the pre-determined purpose of the selection of the classes were formed according to the variability of creativity of the students. Total 150 students of Std. IX had participated. The composition of the sample was found as shown in Table 5.3 below.

**TABLE - 5.3**

**COMPOSITION OF SAMPLE UNDER STUDY**

<table>
<thead>
<tr>
<th></th>
<th>IX A</th>
<th>IX B</th>
<th>IX C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Girls</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>150</td>
</tr>
</tbody>
</table>
Out of these three groups A, B, C two groups were selected as experimental groups and the rest as a control group. These designs are further classified in the fig. 5.1 i.e. Flow chart of sampling.

**FIGURE NO : 5.1**

**FLOW CHART**

**COMPOSITION OF SAMPLE UNDER STUDY.**

- **CREATIVE ABILITY TEST (CAT)**
  - **PRE-TEST**

- **EXPERIMENTAL GROUP**
  - TOTAL 100

- **CONTROL GROUP**
  - TOTAL 50 IXC

- **CTP - WITH FEED BACK**
  - TOTAL - 50 IX A

- **CTP - WITHOUT FEED BACK**
  - TOTAL - 50 IX B

- **GROUP INTELLIGENCE TEST**

- **CAT POST - TEST**

- **DATA**
5.2.5 **Population**:

Present study covered the students of standard IX of secondary schools of Mehsana District. At the time of investigation there were about 193 secondary schools in Mehsana District. Total 34356 students study in ninth standard which included 20889 boys and 13467 girls students studying Gujarat in different schools, in the year of 1999 were considered as a population.

5.3 **STATISTICAL TECHNIQUES : EXPERIMENTAL DESIGN**:

Experimental design and statistical techniques to be adopted for the testing of the hypothesis. Main design and tools techniques are enlisted are discussed herein in brief, out of which the investigator has made use of the techniques keeping in view the needs of the method adopted. Research and explanation for making solution of these techniques are vividly set out under this chapter.

5.3.1 **Types of Design**

Types of experimental designs can be divided in to groups as follows :

1. **Single Group Design**
2. **Separate Control Group Design**.

5.3.1.1 **Single Group Design**:

Single Group experiments do not involve a separate control or comparison group. These designs are further classified in the following manner.

(a) **One shot case study**:

In this technique a single group or person is exposed to some experimental treatment. The one shot case study is so named because it is often used in case studies. It might also be appropriately called a
single group after experiment to point out that observations are made after the introduction of the experimental variable.

(b) The one-group pre-test, post-test Design.

It is one form of repeated measurement design, since there are two measurements for each S. There may be systematic differences in how Ss respond to treatment-1 and treatment-2 that reflect differences.

(c) The Time Series Experiment

This is a type of cognitudinal research, where Ss undergo repeated measurements both before and after the introduction of the experimental variable.

(d) The Equivalent Time-Sampling Design.

One way to control history in some designs is to randomly vary the presentation of X. So that at times it is present and at times it is absent. An alternative possibility is to compare X₁ and X₂.

In this way experimenter treatments rather than of one treatment and a control. This method eliminated the effect of history because X is presented more than one but it introduces a few other problems.

(e) The Equivalent Material Design.

In single group repeated measurements design, the introduction of X may carry over from one occasion to another. This design is exactly the same as the above (d) design except that different materials are introduced throughout the course of experiment.

5.3.1.2 Separate Control Group Designs:

Such experiments required at least one comparison. Comparison may be between two or more experimental treatments or between groups exposed to X and groups not exposed. Some well-known techniques are like these.

(a) Static Group Comparison
When applied to the static group comparison the term "Pre-experimental" is unusually descriptive, because this type of design leaves many factors uncontrolled. The difficulty with the design is that the investigator has no way of knowing if the groups were equivalent before the introduction of X. Another difficulty with this design is mortality, but there could be no experimental mortality if groups remained unchanged throughout the entire experiment.

(b) The pre-test, post-test control Group Design with Randomisation

This is the first "true experimental" design because major controls are provided for internal validity and for at least some sources of external validity. The effect of history can be disregarded because anything that affects the $O_1 - O_2$ difference is also likely to affect, difference between $O_3$ and $O_4$ assuming of course that experimental and Control groups are tested together and at the same time.

(c) The Soloman Four Group Design

In an effort to eliminate some of the difficulties in generalising with above (b) design. Soloman proposed using four groups. In this technique the last two groups receive no pre-test and all the groups are initially equivalent through randomisation. Hence the investigator can determine the effect of pre-test $O_1$ and $O_2$. Most of the major variables are controlled here in this design, so Campbell and Stenly consider it to be a true experimental design. (d) The Post-test only control Group Design.

In this technique only the last two groups in the Soloman four group design are employed, providing an experimental and a control group, but no pre-testing. This is the third and last of the true experimental designs.
(e) The Non-equivalents Control Group Design:

This quasi-experimental design makes use of infact groups of classrooms which are formed on the basis of some natural grouping. Thus, experimental and control groups are not formed by randomly assigning Ss although they could be matched. A minimum requirement for this technique is that pre-test scores for the experimental and control groups should be as similar as possibly.

(f) Separate sample pre-test post-test Design.

At times experimenter may have to work with large out separate samples of groups of Ss which can not be selected at the same time. This technique allows the investigator to make a comparison between groups receiving X and those not exposed to X.
<table>
<thead>
<tr>
<th></th>
<th>History</th>
<th>Maturation</th>
<th>Testing</th>
<th>Instrumentation</th>
<th>Regression</th>
<th>Selection</th>
<th>Mortality</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE-GROUP DESIGNS</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>Dees not allow for comparison of changes no premeasures.</td>
</tr>
<tr>
<td>1. One-shot case study.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. One-Group pretest posttest design.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>A type of repeated measurement design but with a single group.</td>
</tr>
<tr>
<td>4. Equivalent time samples</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Generalization is only to other groups which are repeatedly tested.</td>
</tr>
<tr>
<td>5. Equivalent materials design.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Generalization again restricted to groups tested repeatedly.</td>
</tr>
<tr>
<td>SINGLE CONTROL GROUP DESIGNS</td>
<td>+</td>
<td>?</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Along with designs 1 and 2, this is a per experimental design</td>
</tr>
<tr>
<td>6. Static-group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. pre-test-post test control group design with randomization</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>A true experimental design; generalization restricted to other pretested groups.</td>
</tr>
<tr>
<td>8. solomon four group design</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Another true experimental design; requires use of multiple groups.</td>
</tr>
<tr>
<td>9. pottest-only control group design.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>A third true experimental design.</td>
</tr>
<tr>
<td>11. separate-sample pretest posttest design.</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>?</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>Generalization facilitated.</td>
</tr>
</tbody>
</table>
To get the comparative idea all the described techniques table 5.4 is given on the next page. It gives major advantages and disadvantages of experimental design.

Looking to the above, one can infer that separate control group design (i.e. technique from type II) is the applicable type for the study under taken. moreover (b) technique i.e. the pre-test, post-test control group design with randomisation is the most suitable to be adopted for the research. Justification is the most suitable technique which can be given as:

1. Selection is eliminated here because SS have been assigned at random to experimental and control groups.
2. Instrumentation can also be controlled by having the same observer participating with both groups.
3. There is a control group comprised of the same type of SS as are in the experimental group regression can be ruled out.
4. The experimental and control groups are tested together and at the same time.
5. The effects of experimental morality can also be checked by examining, the pre-test scores of those who failed to show up for the post-test comparison.

5.3.2 ANOVA: A Factorial Experiment:

In some experiments, there are two or more independent variables, each of which is varied in two or more ways, called 'ANOVA'. It experimenter takes all possible combinations of variables with levels and incorporate each combination as a separate experimental condition, the arrangement made, is known as Factorial Design. In a factorial experiment, the effect of number of different factors is investigated simultaneously, particularly with an aim to study not only the main
effect of the factors involved but also interaction effects which are best studied with factorial design.

Allen L Edward defines the three models according to the levels of factors as below:

"When the levels of factors are not randomly selected, the ANOVA model is referred to as a fixed model, when the levels of each factor have been randomly selected from the large population, the ANOVA model is referred to as a random effect model. If the levels of some factors have been randomly selected and those is referred to as a mixed model."

In this study there are three groups: Two experimental groups and one control group, where two of these groups will get training through creative thinking programme developed by the investigator and other will not. Out of these two experimental groups one group would get a chance of discussion and feedback on programme content, while second group would not get a chance of discussion and feedback but allow to use the creative thinking programmes developed by investigator. Other two independent variables as discussed ahead, are sex and intelligence of the study. The investigator has decided to take two levels of each by considering above median and below median scores. Therefore ANOVA model of this study is a mixed model and hence it involves both fixed effects and random effects.

To study the effect of treatment (Creative Thinking programme) Sex and intelligence on the creativity of the students. 3x2x2 factorial design with a randomised group design has been employed as a statistical tool.
5.3.3 Statistical Technique in ANOVA

In this ANOVA technique, the treatment, sex and creative ability are the independent variables, while the creative ability score obtained by the students after taking creative ability test developed by Dr. J.Z. Patel is the dependent variable. The 3x2x2 factorial design has been developed in the given tabular form.

**TABLE NO - 5.5**

**3x2x2 FACTORIAL DESIGN FOR DATA ANALYSIS**

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable</th>
<th>Treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A&lt;sub&gt;1&lt;/sub&gt;</td>
<td>A&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>Intelligence</td>
<td>Creative Scores</td>
<td>CTP</td>
<td>CTP</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td>with</td>
<td>without</td>
</tr>
<tr>
<td>PCA</td>
<td></td>
<td>F.B.</td>
<td>F.B.</td>
</tr>
</tbody>
</table>

For both conditions C<sub>1</sub> and C<sub>2</sub>, the table is structured with columns for the independent variables and rows for the dependent variables. The treatment columns indicate whether the students received the program or not, and the total column shows the overall score distribution.
Before proceeding for F-test it would be proper to look into the assumptions underlying ANOVA technique. They are parametric assumptions; Viz -

(1) An equal unit scale is assumed for the measurement of the dependent variable.

(2) Homogeneity of variance is the basic assumption that is, the samples of the group coming from the same population have equal variance.

For the test of homogeneity the F max test can be used. The formula for $F_{max}$ (Allen L.Edward) is given below:

$$F_{max} = \frac{\text{Maximum variance}}{\text{Minimum variance}}$$

If the $F_{max}$ value is not significant, the basic assumption (2) is found to be satisfied.

Hence ANOVA summary has been given to test whether the group means differ or not, in the following form.

**TABLE NO - 5.6**

ANOVA SUMMARY SHOWING BETWEEN GROUPS AND WITHIN GROUPS

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean SS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The level of significance at 0.05 and 0.01 level of confidence has been accepted in educational research.

Next the summary of the complete ANOVA to test whether there exist the effect of independent variables or not and whether there exist any order of interactive effect of variables on the dependent variable, say creativity, would be of the form shown below:

**TABLE NO - 5.7**

**SUMMARY OF THREE WAY**

**ANOVA**

<table>
<thead>
<tr>
<th>No.</th>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Treatment $A_1$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Treatment $A_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$B$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$A_1 \times B$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$A_2 \times B$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$A_1 \times C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$A_2 \times C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>$B \times C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>$A_1 \times B \times C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>$A_2 \times B \times C$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The values of $F$ are obtained by dividing each of the mean sum of squares (MSS) by error variance, i.e. within groups mean square. The level of significance at 0.05 and 0.01 levels of confidence has been accepted to study the main effect and interactive effect on the creativity. Thus the hypothesis could be tested for acceptance or rejection.

5.4 EXECUTION OF CREATIVE THINKING PROGRAMME:

The resultant work derived from the use of foregoing tools, techniques etc. is elaborately discussed in this chapter under four heads:

1. Familiarisation with Programme
2. Experimental Work
3. Response analysis
4. Observations during work

5.4.1 Familiarisation with Programme:

Before implementation of creative thinking Programme, the person incharge should be familiarised with the programme and its execution as shown in the programme booklet, This chapter includes in specific aspects of pre-experiments namely, Introductions, Time Schedule and the programme Format.

5.4.1.1 Instructions:

Stressing the importance of the directions given in the test manuual. Thorndike5 States:

"It is very important that the instructions be clear and adequately detailed. When the test is of familiar form and the procedures are simple, a brief paragraphs of Instructions will suffice."

As this type of programme seems to be new one, the instructions, needful and the details such as method of reading the informative paragraph explanations regarding the types of activities and importance
of such work. The directions for the administering the creative thinking programme they prepared minutery as shown in appendix-2.

5.4.1.2 Time Schedule :-

The creative thinking programme includes three programmes having with ten lessons each, which is to be spread over ten weeks duration as determined in Chapter IV. Flow chart will give the idea of a study at a glance. Problem items testing required one period of 45 minutes. In the beginning the implementation started with creative ability test [CAT] as a pre-testing.

It was given to all the three groups of students under study. All the three groups were so formed that they found homogeneous on the achievement test.

By the next week of the pre-testing the two groups were selected randomly for experimentation and third group was treated as a control group. i.e. no such programme was to be given to the students of control group. One of the experimental group received the feedback through discussion while the other experimental group did not receive. Both the groups required thirty periods for training to think differently in the various conceptual thoughts and situations. In the beginning three periods per week, so that the training periods lasted for ten weeks. The duration of each period was 45 minutes in the school time table. After completion of the programme the creative ability test was given to all the three groups to study the effect of programme. Thus the experimental work required ten weeks duration to train the students to think to measure the creative ability of the students.

5.4.1.3 Format of the Programme :-

The format of the programme was discussed in detail in Chapter-IV. The activities [creative thinking] 1 and 2, in each programme pertain to conversion thinking where the programme had not to be more
familiar with such activities or situations. Activities 3 and 4 pertain to divergent thinking and activities 5 and 6 pertain to creative ability. These activities need where the programmer is required to be more familiar with such activities.

Moreover, he had to respond to the stimulus in different ways. Last activity is of intelligence where the students have to think most logically.

The whole programme i.e. thirty lessons, consists of 160 items, so the time required for training was 30 periods. There periods per week. So that training lasted for ten weeks i.e. 2 and half months.

Implementation started with CAT as pre-test. It was given to all three classes of IX grade at a time in separate classes. Three teachers of the school complex assisted the investigator during the testing.

5.4.2 Experimental Work done:

On the first day of training the students were supplying a small note-book as a answer book for CAT. On the front page of answer booklet, they were requested to give their required personal data. A small form of data collected is shown in Appendix-8.

Also the students were supplied with the programme booklets containing items for giving answers. The investigator put ample below each item of CTP properly. They were requested to give their personal data on the front page of answer booklet. The investigator established the rapport with some introductory remarks, just as -

"Today we are going to do some work in a methodical way. You will be supplied a problem you will have to think about the problem and give the answer. On second page of each programme are given certain definition, thinking process of given problem and given a model solution of such type of problem. By giving the solution of such a problem, the Students should inspire and motivate to give the answer
of other experimental problems. For the programme content read carefully and you will have to think about the solution and give the answer in the same booklet.

You are asked to think from different angles of the situation and thought of the given problem. This is not a test or an examination but a training. We shall work together for 2.5 months. So please be honest in your work. Do not try to cheat or copy but write as many answers as you can, for each item in your programme."

The time schedule for the execution of whole programme is shown in the table 5.8 to follow.

**TABLE - 5.8**

**PROGRAMME WISE PERIOD DISTRIBUTION**

<table>
<thead>
<tr>
<th>Weekly</th>
<th>Period</th>
<th>Day</th>
<th>Lesson No.</th>
<th>Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>Oral</td>
<td></td>
<td>Preliminary items and Instruction.</td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>Monday</td>
<td>1</td>
<td>Recognise</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Wednesday</td>
<td>2</td>
<td>Analyse</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Friday</td>
<td>3</td>
<td>Compare</td>
</tr>
<tr>
<td>II</td>
<td>4</td>
<td>Monday</td>
<td>4</td>
<td>Select</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Wednesday</td>
<td>5</td>
<td>Find other ways</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Friday</td>
<td>6</td>
<td>Start</td>
</tr>
<tr>
<td>III</td>
<td>7</td>
<td>Monday</td>
<td>7</td>
<td>Organise</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Wednesday</td>
<td>8</td>
<td>Focus</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Friday</td>
<td>9</td>
<td>Consolidate</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Monday</td>
<td>10</td>
<td>Conclude</td>
</tr>
</tbody>
</table>
**TABLE - 5.9**

**PROGRAMME WISE PERIOD DISTRIBUTION**

[Weekly]

**SECOND PROGRAMME**

<table>
<thead>
<tr>
<th>Week</th>
<th>Period</th>
<th>Day</th>
<th>Lesson No.</th>
<th>Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>Oral</td>
<td></td>
<td>Preliminary items and Instruction.</td>
</tr>
<tr>
<td>IV</td>
<td>11</td>
<td>Wednesday</td>
<td>11</td>
<td>Examine Both Side</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Friday</td>
<td>12</td>
<td>Evidence : Type</td>
</tr>
<tr>
<td>V</td>
<td>13</td>
<td>Monday</td>
<td>13</td>
<td>Evidence : Value</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Wednesday</td>
<td>14</td>
<td>Evidence : Structure</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Friday</td>
<td>15</td>
<td>A.D.I.</td>
</tr>
<tr>
<td>VI</td>
<td>16</td>
<td>Monday</td>
<td>16</td>
<td>Being Right : 1</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Wednesday</td>
<td>17</td>
<td>Being Right : 2</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Friday</td>
<td>18</td>
<td>Being Wrong : 1</td>
</tr>
<tr>
<td>VII</td>
<td>19</td>
<td>Monday</td>
<td>19</td>
<td>Being Wrong : 2</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Wednesday</td>
<td>20</td>
<td>Out Come</td>
</tr>
</tbody>
</table>
TABLE-5.10
PROGRAMME WISE PERIOD DISTRIBUTION

[Weekly]

THIRD PROGRAMME

<table>
<thead>
<tr>
<th>Week</th>
<th>Period</th>
<th>Day</th>
<th>Lesson No.</th>
<th>Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>Oral</td>
<td>0</td>
<td>Preliminary items and Instruction.</td>
</tr>
<tr>
<td>VII</td>
<td>21</td>
<td>Friday</td>
<td>21</td>
<td>Information</td>
</tr>
<tr>
<td>VII</td>
<td>22</td>
<td>Monday</td>
<td>22</td>
<td>Questions</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Wednesday</td>
<td>23</td>
<td>Clues</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>Friday</td>
<td>24</td>
<td>Contradiction</td>
</tr>
<tr>
<td>IX</td>
<td>25</td>
<td>Monday</td>
<td>25</td>
<td>Guessing</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>Wednesday</td>
<td>26</td>
<td>Belief</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>Friday</td>
<td>27</td>
<td>Ready-mades</td>
</tr>
<tr>
<td>X</td>
<td>28</td>
<td>Monday</td>
<td>28</td>
<td>Emotions</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>Wednesday</td>
<td>29</td>
<td>Values</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Friday</td>
<td>30</td>
<td>Simplication and Clarification</td>
</tr>
</tbody>
</table>

The execution of the programme was carried on as discussed below:

Zero Period:

Before the implementation of CTP the investigator had kept Zero period to establish the rapport with the experimental group during the Zero Period. The subjects under experimental condition were made aware of different types of thinking viz. convergent thinking, Divergent thinking, and evaluating thinking which are the primary base for the CTP. The investigator had clarified these three terms with appropriate situational problem as mentioned below:
(I) Convergent Thinking:
- How would you start to think about the certain situational problem?

(II) Divergent Thinking:
- Should guardian take care of their children about the study of School?

(III) Evaluating Thinking:
- Only the School teachers are responsible for the progress of the study of the Children.
- Justify the statement suggesting the arguments on one side and other side. (Examine both sides)

The investigator had collected all the responses and put before the class for discussion to find very uncommon responses and for the divergent thinking and logical thinking, justifying the statements. Thus the students were familiar with the three types of thinking and the best rapport was established between the teacher and the taught. So much that the students could participate whole-heartedly through the experimentation of the CTP.

According to the time schedule of the programme implementation, the investigator had treat both the experimental groups on the same day every week.

**FIRST PROGRAMME:**

**First Period:** Recognise:

The first lesson of the first programme with activity from the booklet was distributed to each student of the experimental group. The first lesson was based on "Recognise".

Recognition is possible the most basic of all thinking operations, since it either precedes all others or is their aim. In everyday life as
soon as we recognise something we know how to deal with it. The process is usually unconscious. The recognition of concrete objects is not very important since unknown objects are relatively rare in ordinary life.

You have to recognise a problem situation before you can begin to try and solve it. You have to recognise a planning situation before you sit down to make a plan. It is this deliberate attempt to identify a situation in order to know what to do about it, this is practised in the lesson.

Before the implementation of this lesson the investigator had given certain clarification about the lesson. The concern useful definitions, thinking process of the lesson were summarised in the beginning of the lesson. By hits of lesson students were inspired and motivated to solve the given experimental problem.

Students were then asked to write down the imaginative solutions of the problems. The time duration of this activity based on divergent thinking was kept 6 minutes. In the activity uncommon responses were collected and shown on the blackboard. They were as under:

1. The students are only responsible for their progress of study.
2. It is forbidden to take any book or paper in the examination hall.
3. An obedient student should always be honest in every activity of the school.
4. Ramesh works hard but could not get highest rank in his class.

Thus this activity was found to be difficult but after providing the stimulation the students could apply their imaginative thinking to solve the problem. Creative thinking Ability (CTA)

CTA 1.1

This activity required the higher level of knowledge, to think
logically on the basis of past learning experience. The students were asked to give the causes on the basis of imaginative thinking.

CTA 1.2

The students were asked to explain to the constructive situational effects on the conceptual thoughts and situations. Incubation period of 2 minutes was provided to think on CTA 1.2. The very uncommon responses were put before the whole groups.

CTA 1.3

This activity required evaluating thinking by justifying the given situations, rationally and applying the imaginative thinking in various modes. It was found that this item required great help from the teacher. The total time required to complete the lesson was found nearly 44 minutes which was found enough as pre-determined period duration. At the end of the period the programme booklet were collected from the students with thanks.

Second period: Analyse

In this period, the work was continued on the same line as lesson-1. The second lesson was based on "Analyse".

Most of the time we are analysing the complex environment into the separate pieces with which we can cope. In this lesson analysis is used in its most basic sense of dividing something up. The purpose of this division is to enable us to understand something, deal with it, or explore if more easily.

For the sake of convenience analysis is separated into two distinct types. The first type is, called 'Original' part analysis and corresponds to the classical search for the true components that make up the situation.

The second type is called 'perceived parts analysis and is a
division not of the thing itself, but of the way it is looked at.

The students were familiar with such work ahead. Immediately students started next item which required the divergent way of thinking. Students gave different ideas on ways of analysis. Uncommon responses were collected and put before the group item 2.5 was evaluating thinking so the students took more time while responding to 2.6. It was found to be very interesting. The lesson was found nearly 43 minutes to complete. At the end of the lesson, the programme booklets were collected from the students with thanks.

Third period :  
Compare :

This lesson deals with the conceptual thought 'compare'. Comparison is an important part of thinking. The purpose of this lesson is to treat comparison as a deliberate operation instead of something that happens new and again.

When neither recognition for analysis tell us enough about something we turn to comparison. We compare something new to something familiar in order to see if we can transfer knowledge from one to the other.

Two different situations can occur. In the first situation we start with something and look around for something with which to compare it. The comparison may cover several points and tell us a lot about the new thing.

Fourth period :  
Select :

This lesson consists in the conceptual situation 'select'. Selection is another basic operation that comes into much of our thinking. The operations may appear in several guises as, selecting, choosing, judging, matching, or fitting, but the basic process is similar. It is a matter of having requirements and seeing how well they are met. When something fits your requirements you choose or select it whether it is
a bus, it is a house, a new job, a car. Selection is the broad process of trying to find something that fits your requirements. In practice three actual situations may occur:

(1) Testing to see whether something offered (as explanation, solution etc.) fits or does not fit. "Is there a good fit?" The operation involves looking to see at which points the requirements are met and at which points they are not.

(2) Choosing from among different possibilities. "Which fits best?" The operation involves finding the priorities among the requirements (i.e. doing a fit on them) and then seeing which of the possibilities fits most of the priorities.

(3) Finding something to fit the requirements. "What fits this?" The operation involves being conscious of the requirements and then looking for something that fits them.

The whole emphasis of the lesson is on 'requirements' and 'fit'. During the lesson the teacher can ask pupils to list requirements in order of priority. A clear view of requirements makes selection much easier.

The students took more interest to solve the problem. Uncommon response were collected and put before the group. The lesson was found nearly 43 minutes to complete. At the end of period the programme book lets were collected from the students with thanks.

Fifth period : Find other ways :

The purpose of this lesson is to get pupils to make a deliberate attempt to look at things in different ways. It is not just a matter of looking for alternative when the obvious way is inadequate. The emphasis is on trying to find other ways even when there is no apparent need to do so. In any situation a pupil should be able to ask himself.

Are there other ways of looking at this?
Alternative ways of looking at something may come from many sources:

Lateral thinking: Elections could be said to vote for the candidate they liked or they could be said to vote against the candidate they disliked.

Other point of view (OPV): Strikes viewed as a genuine bargaining device by unions but as unnecessary work disruption by employers.

Different focus: A car looked at in terms of power and performance or in terms of comfort and appearance. Also as a means of getting to work or a source of traffic congestion item 5.1 was found to be very interesting. Item 5.3 based on sources and the students gave correct response. While uncommon responses were collected and put before the group. The total time required to complete was 44 minutes. At the end of the period, the programme booklets were collected back.

Sixth Period: Start:

This lesson deals with 'start'. This lesson is about the practical business of starting to think about something. The whole emphasis of the lesson is on encouraging the pupils to make definite, crisp and deliberate start.

Whenever a person is thinking about something, there must be a start. So why do we need to make deliberate what is automatic and obvious? Because the natural start is usually a matter of drifting into the subject at any point that happens to come to mind. In order to make a deliberate start you have to consider the type of situation and where you want to end. On the other hand a comparison may illustrate just one aspect and so enable us to see this more clearly. In this situation we ask the question: what is this like?

The second situation arises when a comparison is put forward as a basis for transferring experience. Two things may be said to be
alike, for instance, the working capacity of men and women. In this situation we ask the question:

In what way are they similar?
In what way are the different?

The emphasis of the lesson is on making comparison into a deliberate operation with a definite outcome.

Students gave different ideas on the way of comparison after reading this conceptual situations.

Uncommon responses were collected and put before the groups. The lesson was found nearly 44 minutes to complete. The programme booklets were collected from the students with humble regards.

After some instructions by the teacher, the students immediately started the lesson reading keeping the imaginative idea of the certain situations.

Item 6.3 was rather difficult but by the definite hint of the teacher they solved the problem carefully. The responses of the students were more original. The lesson was completed nearly in 42 minutes. The programme booklets were collected from the students with highly respect.

**Seventh period:** Organise:

This lesson consists with 'Organise.'

This lesson follows on directly from the previous one: having decided how to start thinking about something the next step is to organise the framework for the rest of the thinking. The whole emphasis of the lesson is on having some definite and deliberate organisation. The important thing is that it should be definite and that there should be a deliberate effort to setup a plan. The plan includes operations, headings, questions etc. in a simple order. So what ever you are doing you know what is to be done next.
The first operation is to ask easy question: How do I organise this? The second operation is to consider the situation and put down some definite plan. The organisation need not be complicated, comprehensive or even right. The important thing is to have a definite organisation. The pupils are encouraged to develop the deliberate habit of organising.

In this lesson, students read all the problems. Students taught about the various types of organisation and look more interest to response the problem. Uncommon responses were collected and put before the groups. The lesson was found nearly 42 minutes to complete which was enough as pre-determined time duration. At the end of the lesson, programme booklets were collected from the students with thanks.

**Eighth period:**

Focus:

This lesson deals with 'focus'. Like many others, sounds obvious it is a very important one. In discussion or personal train of thought the mind moves from one aspect of the situation to another. This is a natural flow and the people involved assume that they know what they are thinking about. But if you stop someone mid-thinking and ask "Exactly what are you looking at now"? the answer is usually very vague.

This lesson concerns with 'Focus' conceptual situation. This lesson was rather difficult or different by the changing the focussing view of the problem. By the humble guidance of the teachers the students were immediately followed the lesson. The responses of the students were more original. Uncommon responses were collected before the groups. The lesson was completed in time. At the end of the period, the programme booklets were collected from the students with respect.
Ninth period: Consolidate:

This lesson deals with 'consolidate'. The intention of this lesson is to encourage a deliberate pause for consolidation in a discussion or personal thinking about a matter. The emphasis is on the deliberate asking the question "How far have I got?"

A consolidation may include a list of points made and area considered. At times it may resemble a summary of conclusion, but the important difference is that it can be done at any time. By showing in a definite manner what has been discussed. A consolidation makes it easier to see what has so far been left out.

This lesson concerns with the situations to consolidate. First of all observe the various situations. Study minutely the situations. Arrange the every parts of the situations. Then by the view of Gestalt, consolidate the whole situations.

The students read the various situations given in the lesson. They responded by the various modes. The students felt some difficulty, but by the humble guidance of the teacher, they completed their lesson in time. The programme booklets were collected from the students with thanks.

Tenth period: Conclude:

This lesson deals with 'conclude.' The whole emphasis of the lesson is on reaching a definite conclusion. The whole conclusion may actually say that this is itself a conclusion. In practice there can always be a conclusion of one sort or another. That is why the pupil notes offer a number of different types of conclusions. (Idea, picture, opinion-Judgement, Answer-solution, operation-action) similarly the suggestion in the pupil notes that conclusions may be definite tentative or chargeable is to get pupils away from the domestic conclusions are the only possible ones.
This lesson was rather similar lesson-9. Hence the Students immediately follow the problem and gave response originally.

The lesson was completed in time. And at the end of the period the programme booklets were collected from the students with thanks.

Eleventh Period : E.B.S. (Examine Both Side)

Second Programme of this creative thinking Programme is beginning with this lesson. The lesson consists of 'E.B.S. (Examine Both Side)'. The type of this Second Programme is rather differ from the first programme. Just as there was a certain conceptual statements. The statement would be justified by given one sided arguments and other sided arguments.

Eleventh lesson deals with E.B.S. (Examine Both Side). Conceptual thought of this lesson is that the every situation should be seen with the both sides. There were four problems given in this lesson.

First of all, before the implementation of the first lesson of the second programme of CTP, the investigator had given certain instructions regarding the clarification about the type of the lesson. Students were then asked to write down the arguments or explanations responding the statement.

This was first a new innovative process. It was rather difficult to argue the statement. The teacher gave them certain hints. As and when the students gave their opinion the time duration of this activity based on divergent thinking was kept 6 minutes. The students were asked to apply their imaginative arguments.

In the activity, uncommon responses were collected and put before the group. The responses of the students were indeed original and just imaginative. So the students took more time to solve the statements. The lesson was found nearly 44 minutes to complete. At the end of the period, the programme booklet were collected from the students with humbly regards.
Twelveth Period: Evidence: Type:-

Period 12 consists in evidence: Type: The word evidence covers all the ideas, points, support etc. put forward to make a case in an argument.

The purpose of the lesson is to get pupils to examine each piece of evidence put forward and to decide whether it is a FACT or an OPINION. FACT includes ordinary fact, personal experience, common experience examples which have actually occurred. OPINION includes ordinary opinion, feeling, prejudice, belief and guesses. Anything which is subjective is an opinion, anything which is objective is a fact.

The students first read the statement carefully and think about the certain arguments for the given statement. Some of them were gripped immediately, whereas some of them were puzzled into the statement. After a humble hints of the teacher, students immediately realised the whole fundamental statements. In the activity, uncommon responses were collected and put before the group. The period was completed in time, and the programme booklets were collected from the students with thanks.

Thirteenth Period: Evidence: VALUE:-

This time, the lesson deals with examining the importance of a piece of evidence to the arguments it supports. This importance is called Value. Three types of value are suggested.

KEY (Evidence): The Central point or key point on which the whole argument depends. If it was not there or was destroyed the argument would collapse.

STRONG (Evidence):-

Gives strong support to the argument, but no one piece of evidence is vital. Certainly needs to be considered.
Week (Evidence) - May seem important or type, but really adds very little and could be ignored.

The purpose of the lesson is to get pupils to examine the evidence in a deliberate manner and to assess its value.

After some instructions, the students first read all the statements of the lesson carefully. Students taught rather about the statement. Though the item No:2 was rather difficult, the students realised the things by the help of their teacher. They completed their lesson in time and then the programme booklets were collected from the students with thanks.

Fourteenth Period : Evidence : STRUCTURE :-

This lesson deals with evidence : STRUCTURE some pieces of evidence stand on their own but others depend on some other piece of evidence.

The purpose of the lesson is to get pupils to look at the structure of evidence at the way evidence is put together to make up the argument. With more able pupils it may be possible to look at the whole structure of evidence in an argument.

The lesson with activity from the booklet was distributed to each of the students. Students were then asked to write down the argument of the statement. The time duration of this activity based on divergent thinking was kept 6 minutes. The students were asked to apply their imagination to given situational statement. In the activity uncommon responses were collected and put before the group.

Thus, this activity was found to be difficult but after providing the stimulation, the students could apply the imaginative aruge to the given situational statement with great pleasure. The total time required to complete the programme was found nearly 43 minutes. At the end of the period, the programme booklets were collected from the students with thanks.
Fifteenth Period:  
A.D.I.:  
This period deals with A.D.I. i.e.
A = Agreement  
D = Disagreement  
I = Irrelevance  
In an argument it is quite natural to assume that everything the other side says is wrong and must therefore be opposed. This makes agreement of compromise extremely difficult.  
The purpose of the A.D.I. is to provide a deliberate device for mapping out the areas of agreement, disagreement and irrelevance. It does require an effort to find the areas of agreement between your own position and that of your opponent.  
A pupil can be asked to 'do an A.D.I.'. This means listing the points of agreement first, then the points of disagreement and finally the points which seem irrelevant.  
The students read all the statement of the given lesson. They feel rather difficult but by reading again and again, they already realised the thing. They completed their lesson in time. And programme booklets were collected from the students with humble regards.  
Sixteenth Period:  
Being Right-1 [SHOW, REFER]:  
This lesson deals with 'Being Right-1 (Show, Refer). The lesson consists with two of the main ways of proving a point or being right in an argument. The pupils are asked to observe an argument and then to comment on which way is being used. The two ways described in this lesson are: SHOW and REFER. SHOW includes showing what something means: showing why an idea would work or would not work. Showing what would happen if an idea was carried out: Showing all the implication and logical deductions. In fact, 'Show' covers all the usual ways of proving a point.
REFER includes referring to some outside source of support for the arguments. It can mean bringing in facts and figures. It can bring in experts or authority. It can refer to personal experience. It can also refer to feelings or instincts.

After distributing the programme booklets, the students read through lesson. Items were easy then the other lesson. Students narrated their arguments regarding the statement. The students took much interest in responding the comparative argument. The period was completed in time and programme books were collected from the students.

Seventeenth Period: Being Right-2 [NAME, JUDGE] :-

This lesson deals with the remaining two ways of being right: NAME and Judge.

NAME :- Someone identifies a situation and gives it a name. In this way the experience and value attached to the name become attached to the argument either in favour of something or against something.

JUDGE :- Here a value - work or value-adjective is used directly to indicate whether something is good or bad. It is necessary to explain that both these ways of being right are very often abused.

After distributing the programme booklets the students read all the statements carefully. Then they tried to give some argument about the statement. Uncommon responses were collected and put before the group. Item-3 was rather difficult than other items. But by the help of the teacher the students made up their mind about the solution. The lesson was completed nearly in forty four minutes. At the end of the period, the programme booklets were collected from the students with thanks.
Eighteenth Period: Being Wrong-1 [EXAGGERATE, MISS-OUT]:

The emphasis of the lesson is on being able to recognise and pick out the "EXAGGERATE' and MISS-OUT" ways of being wrong. At first this applies to the other sides arguments, but once the concepts become clear it applies to one's own thinking. It is important to illustrate each way very clearly with definite examples and not to try and clarify the processes by distinguishing them from others.

**Exaggerate:** This involves straightforward exaggerate. It also involves taking things to extremes.

**Miss-Out:** This involves looking at only part of the situation and ignoring or missing-out other parts or factors.

The programme booklets were distributed to each student of the class. The students read all the statements carefully. Then they gave their arguments to the statements. Statements were easier than any others. The period was completed in time. The programme booklets were collected from the students with humble regards.

Nineteenth Period: Being Wrong-2 [MISTAKE, PREJUDICE]:

This lesson is concerned with the remaining two ways of being wrong, i.e. Mistake and Prejudice.

**Mistake:** This covers all the examples of the ordinary type of error or mistake. VIZ. mistakes in facts, mistakes in identifications, misinterpretations, misunderstanding, getting things wrong in a variety of ways. Usually the mistakes are genuine.

**Prejudice:** This applies to those fixed ideas which are not the result of thinking and which can not be altered by thinking. In practice, it may be difficult to distinguish between an idea that seems to be prejudice.

After distributing the programme booklets, the students read through lesson. Items were rather simple. The students narrated their
arguments regarding the statements. The students took much interest in responding the comparative arguments. The period was completed in time and programme booklets were collected from the students with humble regards.

**Twentieth period : OUT-COME**

The whole emphasis of this lesson 'out come' is to get pupils to make a conscious and deliberate effort to assess what has been gained from the argument. On the one hand it is very easy to feel that nothing at all has been gained and on the other hand it is easy to feel that something has been gained but does not need expressing in words.

As soon as, a person decides which of these could be the outcome, he showed than concentrate on deliberately spelling it out.

The important point in the lesson is that every arguments does have some sort of out come and this can be stated in a definite manner.

The teacher distributed programme booklets to each student of the experimental group. Then the students read the statement given in the lesson. The items were rather easier than former lesson. They completed their lesson in time. The programme booklets were collected from the students with thanks.

**Twenty First period : INFORMATION (FI & FO)**

Third programme of this creative thinking programme is beginning with this lesson, which deals with 'Information (FI & FO). The type of this third programme is rather differ from the second programme. Just as in this programme there was a certain conceptual thought and a situation. The students should the certain problems and give their imaginative thoughts justifying the statement of the problem.

Before the implementation of this lesson the investigator had given certain instructions regarding the clarification of process of the lesson. Thinking definition, thinking concept of the process, modes of
operations were summarised in the beginning of the lesson. By giving some useful information to the students, they were inspired and motivated to give the solution or explanation for asking problem.

Then the programme booklets were distributed to the students of the experimental group. Students were then asked to write down the imaginative solution of the problem. The time duration of this activity based on convergent thinking was kept 6 minutes.

This was a new innovative process. It was rather difficult to give the answer. But providing the stimulation the students could apply their imaginative thinking to solve the problem. This activity required higher levels of knowledge to think logically on the basis of past thinking process. It was found that item required great help from the teacher.

The total time required to complete the lesson was found nearly 45 minutes which was enough as pre-determined time duration. At the end of the period, the programme booklets were collected from the students with thanks.

Project: After completing the lesson, there had been a group meeting to discuss a certain concept on project-process. The purpose of the project work was to allow the pupils to apply the process learned during the lesson. The practice items used in the lesson itself are intended as illustrations of the process. The project items are intended as an opportunity for the use of the process. Two items can be given to the pupils for them to work upon as individuals. The output should be in essay form or note form. The work can be done by assigned as 'home work'. One or other of the items is chosen either by the teacher or by each pupil for himself. The items could also be used for open class discussion. Here there were two items about the planning of the children, play ground and career after the school study, for project
The investigator had discussed the point of view about the playground and career after the school study. The topics were very interesting. The students took great pleasure. They gave highly responded in discussions. Then teacher gave the homework to write a short note on planning of the children playground, and career after the school study.

**Twenty Second Period:** **Questions (FQ & SQ):**

This lesson is concerned with drawing attention to the asking of questions. The best way we have for finding out the information that we think is missing is to ask questions. A distinction is made between two types of question (FQ) and The shooting question (SQ). Fishing question (FQ) are exploratory. We do not know answer. We may roughly know the area of the answer with an FQ we are exploring and trying to find things out. With a shooting question (SQ) we are not exploring but checking up on something. An 'SQ' always has a 'yes' or 'No' answer. So in a shooting question we know what the answer might be and we are just checking to see if it is so or not. A shooting question is specific and aimed.

The teacher distributed the programme booklets to each student of the experimental group. The students ready the problem and try to think of the answer. The problems were rather difficult but by providing the certain stimulation they completed their lesson in time. Programme booklets were collected from the students with thanks. After completed the lesson, there were a project discussion on topic of "Shopping at a cloth merchant shop." After discussion the teacher gave them homework to write a short note on 'shopping the book'. The students took much interest in discussion.
Twenty Third Period: CLUES (CS & CC):

The purpose of this lesson is to encourage pupils to pick out clues and to consider the use of clues. There are two types of clues. One is clues separately (CS) and other is clues combined (CC).

Clues separately (CS) means examining each clue as with a magnifying glass to try and find out all the things it could possibly mean. This is important.

Clues combined (CC) means examining all the clues together to see what they add up to. The CC always follows after the CS when the clues that have been examined separately are put together two things can happen.

The teacher distributed the programme booklets to each student of the experimental group. The students read the problem and try to think of the answer. The problems were rather easier. They completed their lesson in time. Programme booklets were collected from the students with thanks.

After completion of the lesson there was a group meeting for the purpose of project discussion. The topic 'An Accident' was discussed with all concerned factors. Then teacher gave them a homework to write a short not on 'An Accident.'

Twenty Fourth Period: CONTRADICTION (CO & FCO):

This lesson consists in contradiction there are two types of contradiction:

1) Contradiction (CO)  (2) False Conclusion (FCO).

The principle of a contradiction (CO) is two opposite things both cannot be right at the same time.

False conclusions (FCO) are rather more difficult to explain than contradiction. A false conclusion may be what is known as a "Non-Sequitar." Which means that one thing does not follow the other.
The programme booklets were distributed to the each students of experimential group. After the reading of the problems, there were asked to give their solution. The lesson was completed in time and the programme booklets were collected from the students with thanks. After completing the lesson, there was a project discussion on the topic of 'Labour-Welfare'. After the discussion the teacher gave them homework to write a short note on 'Labour Welfare'. The students took great interest in discussion.

**Twenty Fifth Period :** GUESSING (SG & BG) :-

The lesson deals with 'Guessing (SG & BG)'. The purpose of this lesson is to have a look at 'guessing'. We guess when we do not have enough information to be sure. Sometimes we are forced to make a guess. There is nothing wrong with guessing provided we know that we are guessing and provided we try to get as much information as possible on which to base the guess. There are two types of guessing:

1. **Small Guessing** and
2. **Big Guessing**

1. **Small Guessing : [SG] :-**
   
   We may call the small guess (SG), a forecast, a supposition, an estimate or an expectation.

2. **Big Guessing : [BG] :-**
   
   We may call the Big guess, a gamble or taking a chance. When there is a little or no information, it must be a big guess. When we collect more information then the guess become smaller.

After some important discussions the programme booklets were distributed to each students of the experimental group. They read it thoroughly, they feel it rather difficult. But by providing such stimulation, they gave solutions. The lesson was completed in time. The programme booklets were collected from the students with thanks.
After completed the lesson, there had been a group discussion on project work on the topic "principals role in school Administration". Students took much interest in discussion. Then teacher gave them the same topic in the home work to write a short note.

Twenty Sixth Period: BELIEF (BP & BO):

This lesson deals with 'Belief' (BP & BO). Belief implies that we accept something as being true. For the purpose of this lesson, it is best to ignore weak or partial beliefs. This lesson is concerned with the origin on our belief. The belief provides the two boxes.

1. **Belief personal (BP):** Belief Personal (BP) is based on personal experience, feeling or proof. A person does his believing for himself. A person does his believing for himself. He may collect a lot of information from other people.

2. **Belief Others (BO):** Belief others menas that instead of a person doing his believing on his own he takes over the beliefs of others.

Some people are indeed experts because they have specialised knowledge of experience.

After giving some important instructions, the programme booklets were distributed to each students of the experimental group. They read all items of the lesson, then they gave their responses regarding the problem. Un common responses were collected and put before the group. The lesson was completed within 44 minutes and the programme booklets were collected back from the students.

After completed the lesson there was arranged a group discussion on project work. The topic was "A Role of Library to build up the student career". After healthy discussion the students gave good responses to discussion. The the teacher gave them homework to write a short note on the above topic.
Twenty Seventh Period: RESDY MADE (RM-H, RM-S):

This lesson consists in "Ready-mades" (RM-H, RM-S).

A ready-made is a piece of thinking that is taken over from someone else rather than constructed for oneself. There are two boxes of ready-made.

[1] Ready-made as a Help (RM-H):- No one can know everything or find out everything for himself. We often have to use the information, belief or opinions offered by others.

[2] Ready-made as a substitute (RM-S):- When we use it not as a help to our thinking but as a substitute, then we call it ready made as a substitute (RM-H). It is much easier to recognise an RM-S than an RM-H. If the opinion or belief is taken over without alteration or consideration it is an RM-S. If there is any thinking about it then it is an RM-H.

After some important discussions regarding the topic of the lesson, the programme booklets were distributed to each student of the experimental group. The students gave their responses very well. The lesson was completed in time. The programme booklets were collected from the students.

After completing the lesson a group discussion was arranged on the topic. 'The general norms of the public examinations'. The students participated in discussion with great interest. Uncommon points were discussed by the help of personal care. The teacher gave homework to write a short note on 'The general norms of the public examinations.'

Twenty Eighth Period: EMOTIONS (EM & EG):

This lesson is about the influences of emotions on thinking. Emotions give value to thinking. The purpose of thinking is really to perceive reality clearly enough for us to feel about it. The purpose of
this lesson is to encourage pupils to recognise the emotions that are involved either in their thinking or the thinking of others. There are two boxes of emotions.

[1] **Ordinary Emotions (EM)**:  
The ordinary emotions include anger, hatred, love, fear, joy, suspicion, jealousy, sorrow, remorse. These are the emotions which we refer to as feelings. They may be pleasant or unpleasant. They are usually recognisable.

[2] **Ego - emotions (EG)**:  
The ego emotions are concerned exclusively with protecting the ego. The ego-emotions are concerned with status. The EG covers such things as, pride loss of face, needing to be right all the time, not being made to look a fool, being paid attention, etc.

After discussing important points of the lesson, the programme booklets were distributed to each student of the experimental group. The students gave their responses regarding the problem. The programme booklets were collected from students with thanks.

After completing the lesson there was a group-discussion on project work on the topic 'parent's Emotions'. The students took part in discussion with great pleasure. Then the teacher gave them a homework to write a short note on the same topic.

**Twenty Nineth Period : VALUES (VH & VL)**:  
This lesson deals with values (VH & VL) values are the most important thing in thinking. Our decisions, judgement, choices, actions are ultimately all based on the values we use. This point can be emphasised. Our thinking is designed to obtain the maximum amount of information from our experience. Once we have that information we act according to our values. There are two boxes of Values.

(1) **Value - High (VH)**: The examples given for high values (VH)
are those which most people would accept as high or important values, health, honesty, happiness, success, money, what people think, etc.

(2) Value - Low (VL) : The examples given for low values (VL) are more difficult because one does not consciously put a low value may be given.

After some discussion about the lesson, the programme booklets were distributed to each student of the experimental group. The lesson was completed in time. The programme booklets were collected from the students with humble regards.

After completed the lesson, a group discussion was arranged for project work on topic "High values of Head-master of a school." The students gave their responses about the topic. Then the teacher gave them a home-work on the same topic for writing a short note.

30th period : Simplification and clarification

This is the last lesson of the creative thinking programme. This lesson deals with simplification and clarification. A simplification is usually shorter than the original. It may incorporate much of the original in a simple statement, but you have to know the subject very well in order to understand the simple statement. Thus, simplification is the opposite of complication.

With clarification the effort is to make things more clear. The result may well be a statement which is much longer than the original. Different points which are mixed up in the original information might be spelt out separately in order to avoid confusion. Thus, clarification is the opposite of confusion.

After giving some important clarification about the lesson, the programme booklets were distributed to each student of the experimental group. The students got confusion in item-3, but after providing stimulation they completed their lesson in time. Uncommon
responses were collected and put before group. The programme booklets were collected from the students with thanks.

After completed the lesson there was a group discussion for project work about the topic "Is examination indeed needed?" The students participated in discussion and gave their responses and certain arguments were raised about the topic. Then the teacher gave a home work to write a short note on "Is examination indeed needed?".

This was the last period and teacher thanked the students for cooperation.

After the completion of the CTP, the CAT was administered to all the students for post-test study.

5.4.3 RESPONSE ANALYSIS:

The programme was not to be standardized at this level. So the response analysis should not be based on statistical calculation like realiability, validity or norms establishment. This programme is meant for the creativity development. Due to this reason it was necessary to analyse the responses according to the level of creativity. As per suggestions of B.K.Passi the responses less than 10 % were to be considered as highly creative and the responses having percentage between 11% to 28% were called normally creative or common responses. Considering this suggestion as a guideline the responses of all the items were classified into the following three categories:

1. 0 to 15 % responses highly creative
2. 16 to 30 % responses creative
3. above 30 % responses non creative

The responses of the last number i.e.(3), category were neglected for all the 3 type of programmes and the responses of the 1st and 2nd categories were listed as shown in appendix-8.
5.4.4 OBSERVATION:-

The following important observations were made from the implementation of the programme.

(1) As the atmosphere was kept free for the treatment of group students some so called naughty or mischievous students gave unexpectedly very good responses during the training programme. Moreover some students who were found idle in the beginning of the time limit proved quite creative and outstanding in their responses at the end.

(2) Some female students participated in the discussion during the training imparted in the interval between two writing time limits which mislead the investigator into impression that they were less creative. The completion of some items, however, were very good. Rapport was established with the researcher and various responses were obtained from them.

(3) The programme proved to be very interesting and creative too in respect of all the students of standard IX grade.

(4) The programme was found to be a little tough and confusing to many students and they developed a kind of conversion to this type of programme. Some really brilliant students, however, could give creative responses.

5.5 RESUME:

In this chapter, the plan was designed with the help of selected tools, samples, and hypotheses which are narrated to present their importance and due weightage. Separate control group design is accepted and the selection of the statistical technique ANOVA was found fit on the basis of its multiple advantages. The organization and implementation procedures were carried out with due care.

In the next chapter, the data obtained on CAT were put to statistical analysis to study the hypotheses put forth.
5.6 REFERENCES:

(1) Borg Watter B : "Educational Research.
London longmans Green and Co. Ltd. 1963,
P. 16.

(2) Edward de Bono : "Lateral thinking Creativity"
New york, Harper & Raw publication
Inc. 1973 P.121 to 124.

(3) Garrett H.E. : "Statistics in psychology and Education."

(4) Allen L. Edward : "Experimental Design in Psychological
Research."
New york : Holt, Rinehart and winston.
Inc. 1968. P.308.

(5) R.L.Thorndike : "Personal selection."

(6) Passi B.K. : "Passi's test of Creativity."
Manual, Agra : National psychological
Laboratory, 1975. P-10.