CHAPTER-3

METHODOLOGY OF THE PRESENT STUDY

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3.1 INTRODUCTION

Methodology decides the fate of the study and its outcome. As such it is regarded as the heart of any research. Designing provides a picture for the whole study. It is therefore, desirable to have a methodologically designed research plan. In this chapter the following aspects of the methodology of the present study have been discussed : design of the study, variables of the study, sample, tools used, procedure of data collection and procedure of data analysis.

3.2 DESIGN OF THE STUDY

Out of different methods of conducting research, Experimental method was considered appropriate, using " pre-test post-test design". This research design was considered to be the most appropriate to obtain answers to research questions under consideration. The experiment had to be conducted in a DIET without disturbing the natural classroom environment in which the PSTTs were situated. Therefore, the experimental design which requires formation of treatment groups through the process of randomization with little regard to the natural sociometric environment existing in the classroom was not considered suitable for the purpose of experimentation in the present investigation. Under this design, the assembled groups as intact classes which may be similar were taken to constitute the treatment groups, namely, experimental and control groups.

Hence, the intact classes of first year PSTE of two different DIETs were selected for the experimentation purpose. As the two groups were assembled

according to the government's admission policy, they were almost equivalent in terms of their previous schoalstic achievement, number of PSTTs cast category wise and academic stream wise. Thus, these criteria were considered to match the groups for satisfying the requirements of the design, in the present study.

Decision about research design, guides the variables involved in the study, the selection of the sample, tools to be used for data collection, procedures of data collection and statistical techniques to be applied for analysis of data.

3.3 VARIABLES OF THE STUDY

There were three types of variables involved in the present study, namely : (i) independent, (ii) dependent and (iii) control variables.

(i) Independent variable :

Treatment based on specially developed creativity programme was the independent variable.

(ii) Dependent variable :

The measures of ; (i) Fluency (F), (ii) Flexibility (Fl), (iii) Originality (O), (iv) Elaboration (E), and (v) Total Creativity were the dependent variables in the present study.

(iii) Control variable :

Both the experimental and control groups were matched with respest to their age, previous scholastic achievement, and the situated area of the DIETs. So these were the control variables for the present study.

3.4 SAMPLE

The sampling method used in the investigation was purposive. The sample for the present study was formed from the population group of Pre-service Teacher

Trainees (PSTTs), who were studying in the first year PSTE - course in DIETs. In the present study, as the tool to identify the creativity level of PSTTs was to be constructed and standardized which was phase - I of the study ; it demanded two sets of sample for the standardization of the tool. Phase - II of the present study dealt with studying the effectiveness of the Creativity Programme (CP), for which the PSTTs of two different DIETs were selected.

Garrett (1981) describes that, " A sample may be expressly chosen because, in the light of available evidence, it mirrors some larger group with reference to a given characteristic. Newspaper editors are believed to reflect accurately public opinion upon various social and economic questions in their sections of the country. A sample of housewives may represent accurately the buyers of canned goods ; a sample of brokers, the opinion of financiers on a new stock issue. If the saying," As Maine goes, so goes the Nation" is accepted as correct, then Maine becomes an important barometer (a purposive sample) of political thinking. Random sampling formulas apply more or less accurately to purposive samples."

So keeping this in mind and adopting the major considerations , mentioned here under, the sample was drawn by the purposive sampling technique.

- The PSTTs who were studying in the DIET, were selected for the PILOT administration of the tool to identify the creativity level, were not selected again for any other purpose.
- The PSTTs who were selected for the FINAL administration of the tool, were not selected again for any other purpose.
- The PSTTs of first year PSTE-course of different DIET, were selected as the sample for experimentation as no other training inputs may intervene in the present study.

- **Sample for the phase- I of the study :**

An initial sample of 10 PSTTs , who were studying in first year PSTE during the year 1997-98 in DIET - Kathlal (Dist. Kheda), was obtained for PILOT administration of the tool to measure the creativity level.

For FINAL administration of the tool, the whole class of first year PSTE (1998-99) of DIET-Vadodara i. e. 40 PSTTs were selected as the sample, for the phase- I of the study.

Table no. 3.1 shows the distribution of the sample, zone and district wise, keeping in mind, their last schooling.

TABLE No. 3.1

Distribution of the sample size

Zone of the State	Districts	No. of PSTTs
North Zone	Banaskantha	03
	Patan	01
	Mehsana	01
	Sabarkantha	05
Central Zone	Gandhinagar	--
	Ahmedabad	02
	Kheda	--
	Panchmahal	06
	Dahod	01
	Anand	--
	Vadodara	07
South Zone	Bharuch	02
	Narmada	02
	Surat	03
	Navasari	01
	Dang	--
	Valsad	02

Table No. 3.1 (Contd.)

Zone of the State	Districts	No. of PSTTs
West Zone	Bhavnagar	--
	Junagadh	--
	Amerli	02
	Porbandar	--
	Jamanagar	--
	Rajkot	--
	Surendrnagar	01
	Kutch (Bhuj)	01
Total		**40**

*** Source : Office of the DIET - Vadodara**

It can be observed from the above table no. 3.1 that the comprehensive coverage of PSTTs was ensured while selecting the sample for FINAL administration of the tool.

- **Sample for the Phase - II of the study :**

In Gujarat, there were 68 elementary teacher education institutions including 19 DIETs during 1998-99, in which total 4200 PSTTs were pursuing the PSTE-course. Out of the 19 DIETs of the Gujarat state, DIET Rajpipla (Dist. Narmada) and DIET-Santrampur (Dist. Panchmahal) were selected. The total no. of PSTTs, studying in first year PSTE during 1999-2000, of both the DIETs were selected as the sample for Phase-II. 50 PSTTs of DIET-Rajpipla were treated as the experimental group, whereas 50 PSTTs of DIET-Santrampur were treated as the control group. All the PSTTs of both the groups were belonged to the age group of 17-19 years.

Due to transfer to other DIETs and/or getting admission in other colleges, less number of PSTTs were found in both the groups at the time of experimentation. There were total 46 and 43 PSTTs in the experimental and the control groups,

respectively. Distribution of sampled PSTTs of the experimental and control groups at the pre-test and post-test phases of the study is presented in the table no. 3.2.

TABLE No. 3.2

Distribution of the sampled PSTTs of the Experimental and Control groups : Caste Category, Academic Stream and Areawise at the pre-test and post-test phases of the study

Group		Experimental	Control
Total No. of PSTTs		46	43
Caste Category	SC	06	04
	ST	14	12
	SEBC	20	18
	GEN	06	09
Academic Stream	Science	07	10
	General	39	33
Area		Tribal (Rajpipla)	Tribal (Santrampur)

It can be observed from the above table no. 3.2 that, the number of PSTTs in both the groups were more or less equal with respect to caste- category and academic stream.

3.5 TOOLS USED IN THE PRESENT STUDY

A research tool plays a major role in any worthwhile study, as it is the significant factor in determining the sound data which in turn help in arriving at database conclusions about the study in hand, which ultimately, helps in providing suitable remedial measures to the problem concerned.

The following tools were used in the present study for the purpose of data collection.

(i) Test of creativity to identify the creativity level of PSTTs (Constructed by the Investigator).

(ii) A Creativity Programme (CP) for Pre-service Teacher Trainees (Developed by the Investigator).

3.5.1 Test of creativity to identify the creativity level of the PSTTs : (Tool No. 1)

A creativity test, in the form of verbal and non-verbal has been constructed and standardized by the investigator. Four major components of creativity viz. i) Fluency, ii) Flexibility, iii) Originality and iv) Elaboration are being measured with the help of this test, and then, by adding the obtained score of each component, the total creativity score can be obtained for each PSTT. The detailed process of construction and standardization of creativity test is given in the following section.

3.5.1.1 Construction of the Creativity test

Recent advances in the area of creativity research have necessitated the development of suitable measuring tools and devices to assess reliably the creativity level of individuals for their proper education and training. Several attempts have been made to develop tests of creativity in abroad as well as in India, which has already been discussed in the previous chapter.

It goes without saying that all the tests of creativity whether verbal or non-verbal are culturally loaded and especially for the specific age-group. The need for developing tests which would be specifically relevant to a different culture as well as the age-group of the sample is therefore obvious. In the present study, construction of the creativity test, was an attempt to meet this need.

The theoretical framework of the construction of the test of creativity was

provided by the empirical studies on the nature of creativity. Especially useful in clarifying the concept of creativity by Guilford (1950), has made the distinction between two types of thinking abilities, namely ; convergent thinking and divergent thinking. By using this concept and with the help of the tests of creative thinking developed by Mehdi (1973) and Torrance (1972), a creativity test in the form of verbal and non-verbal was constructed. Moreover, the four components (F, FL, O and E) used in the test are considered to be the most important ones to identify creativity, and it was felt that taking together they would give a fairly valid information about the creativity level of the PSTTs.

3.5.1.2 Description of the constructed creativity test

The test which has been used in the present study consists of both the forms namely; i) Verbal and ii) Non-verbal.

(i) Verbal form of the creativity test

Verbal form of the test includes three types of activities, namely; (a) Imaginative events, (b) Novel uses of the things, and (c) Similarity.

(a) Imaginative Events :

In this activity, the subject is required to think as many consequences of the given situations as he can, and write them under each situation in the space provided. The situations being hypothetical, minimize the effect of experience and also provide the subject with an unlimited opportunity to make variety of responses. The activity encourages free play of imagination and originality. Thus the number of relevant responses produced by the subject yields a measure of his ideational fluency, the number of shifts in the thinking trends of the consequences gives the flexibility, and the statistical infrequency of the response or the departure in thinking from the common place gives the measures of originality.

(b) Novel uses of the things :

In this activity, the subject is required to write as many novel, interesting, and unusual uses of the given object as he may think of. This activity measures the subject's ability to retrieve items of information from his personal storage of information. Evidently, it measures also the subject's ability to shift from frames of reference to use the environment in an original manner.

The number of relevant responses may give the measure of one's ideational fluency, the number of thought categories may reflect the measure of flexibility, and uncommonness of responses may point to the measure of originality.

(c) Similarity :

In this activity, the subject is required to think and write as many novel relationships as possible between the two given objects/words of each pair. This activity provides an opportunity for the free play of imagination and originality.

The items of this activity provide possibilities for scoring responses for fluency, flexibility, and originality in the same fashion as for 'novel uses of the things.'

(ii) Non-verbal form of the creativity test :

The non-verbal form of the test includes three types of activities namely; (a) Picture Construction, (b) Picture Completion, and (c) Circles and Rectangles.

(a) Picture Construction :

This activity requires the subject to construct an elaborate picture using the given figure as an integral part. The subject is allowed to turn the page to use the figure in any way he likes for making the picture. Emphasis is put on originality and elaboration. Originality is emphasized by the instruction that the subject should try

to make as novel a picture as possible. Elaboration is emphasized by the instruction that the subject may add as many details as he thinks necessary in order to make the picture tell as complete and as interesting a story or event as possible.

The pictures are scored for elaboration and originality. The subject is also asked to give an interesting and unusual title to each picture. The titles may also be scored for verbal elaboration and originality, and scores added to the verbal creativity score, obtained on the verbal form of the test. The scoring of titles however is optional.

(b) Picture Completion :

In this activity, the subject is required to complete a meaningful picture from the given incomplete figure. The subject is asked to make a picture which no one else in the group will be able to think of. The subject is also asked to give an interesting and suitable title to each picture he makes. Each item is scored for elaboration and originality. The scoring for titles is optional in the same fashion as for 'Picture Constrction.'

(c) Circles and Rectangles :

In this activity, the subject is required to construct different meaningful pictures based on the two forms of given stimuli.

As the subject is here encouraged "to make multiple association to single stimuli", the responses could be scored for flexibility also, besides elaboration and originality. But as this is the only activity in which flexibility scoring is possible, the investigator has confined himself to elaboration and originality scoring alone. The scoring for titles is optional in the same fashion as for 'Picture Construction'.

All the activities taken together provide ample opportunity to the subject to use his imagination with different types of verbal as well as figural tasks and come

out with some novel ideas.

3.5.1.3 Development and Selection of test-items :

At the initial stage the pool of 30 and 35 test-items were constructed under the different activities, for the verbal and non-verbal forms of the test, respectively. The test items were discussed with a panel of three experts with regard to their appropriateness, relevance, and capacity to describe creativity and its components. The list of the experts is given in the Appendix - I. Based on their comments and suggestions, test-items were scrutinised and all those test-items requiring modifications were rewritten by the investigator. Thus, a total of 27 and 30 test-items were retained in verbal and non-verbal forms, respectively. The distribution of the test-items under different activities according to their form and components which would be measured is shown in the table no. 3.3.

TABLE No. 3.3
Distribution of the test items on the try-out form of the creativity test

Name of the activity	Form of the test	No. of test-items included	Components * to be measured
1. Imaginative events	Verbal	09	F,Fl, O
2. Novel uses of the things	Verbal	09	F,Fl, O
3. Similarity	Verbal	09	F,Fl, O
1. Picture Construction	Non-verbal	02	E,O
2. Picture Completion	Non-verbal	12	E,O
3. Circles & Rectangles	Non-verbal	16	E,O
	Total	57	

*** F - Fluency, Fl - Flexibility, O - Originality, E - Elaboration**

The format which thus resulted includes the relevant informations to be obtained from the PSTTs and the directions to respond to the test-items under different activities. The format of the verbal and non-verbal forms of the test, used

for the try-out study are given in Appendix - II and Appendix - III respectively.

3.5.1.4 The try-out of the tool on a selected sample

To make a selection from the pool of total 57 test-items, a try-out study was conducted on a sample of 10 PSTTs of DIET - Kathlal, during the month of March, 1998.

The tryout study was arranged in two sittings. On the first-day, the verbal form of the test was administered and on the next day the non-verbal form of the test was administered. During the time of try-out study, PSTTs were told about the purpose of the test, namely, to identify their creativity in terms of their imagination and new ideas generated while doing the activities, rather than evaluating their performance as right or wrong. PSTTs were placed in a comfortable situation during the try-out. They were also provided answer sheet for the verbal form. For both the forms, the PSTTs were allowed to take their own time in responding to the test-items. However, on and average, the time taken by the PSTTs was about an hour and half for the verbal form of the test, whereas an hour for the non-verbal form of the test. After completion of their work all the test booklets and answer sheets were collected.

3.5.1.5 Procedure for scoring the items

As there is no right or wrong responses for both the forms of the test, much care has to be exercised at the time of scoring. In a verbal form of the test, each test item / activity is to be scored for fluency, flexibility, and originality; while in a non-verbal form each test-item / activity is to be scored for elaboration and originality. As, the scores obtained from both the forms of the test were added for getting total creativity score, both the forms were used as a single combined tool for the purpose of scoring in the present study.

- **Scoring procedure of verbal form of the test**

The following definitions of the creativity components have been kept in mind while scoring the test-items.

Fluency :-

Fluency is represented by the number of relevant and unrepeated ideas which the subject produces. Relevance is judged on the basis of the appropriate-ness of the response which considered in relation to the test-item. An unrepeated idea is one which has been expressed only once under a given test-item.

Thus, fluency socre is simply the number of responses minus the number of duplications and irrelevant responses.

Flexibility :-

Flexibility is represented by a person's ability to produce ideas which differ in approach or thought trend. All ideas which fall under one category of approach or thought trend are treated as one for purposes of flexibility scoring. Thus if five ideas are produced and all belong to only one category of approach or thought trend, then the score for flexibility will be one, but if all the five ideas are based on the five different approaches or thought trends, then the flexibility socre will be five. There could be intermediate scores for flexibility depending on the number of categories of thought trends to which the responses belong.

While scoring for flexibility, the investigator has categorised the responses given by the PSTTs, by giving alphabet serial to each category in the bracket against each response, to which it belongs. Thus, the flexibility score of each PSTT was determined easily by calculating the total number of different aplhabet serials used to identify category of the given responses.

Originality :-

Originality is represented by uncommonness of a given response. The more uncommon the response, the higher is the originality weight.

In the present study, as the sample size was small, the scoring of originality component was done on the basis of statistical uncommonness of responses. It was considered on the basis of the number of PSTTs, who have given the more uncommon responses. Scoring procedure is shown in the table no. 3.4.

TABLE No. 3.4

Scoring for Originality

No. of PSTTs who have given the uncommon response	Originality score to be given to each response
4 or more	0
3	1
2	2
1	3

- **Scoring procedure of non-verbal form of the test**

The following definitions of the creativity components have been kept in mind while scoring the non-verbal form of the test.

Elaboration :-

Elaboration is represented by a person's ability to add more ideas to the minimum and primary response to the stimulus figure. The minimum and the primary response to the stimulus figure is that response which gives essential meaning to the picture. The response title often tells what exactly the testee is

trying to make. However, responses which can be reasonably interpreted and identified should be scored. In some cases, the test booklet will have to be turned around or rotated in order to know exactly what the testee has drawn. Sometimes the response represents some abstract idea instead of a thing and in such situation it has to be scored accordingly.

In the present study, it has been decided that the criterion for determining the primary and minimum response which is the most essential for identifying the response. In other words, only those parts will be considered most essential without which a figure cannot be identified what it means. For example, in a human head, eyes and an indication of nose and mouth would be enough to identify it as head and so all other parts like hair, ear, neck, etc. have been considered as elaboration. Also, the figure was ignored, if it was not relevant and meaningful.

Thus, the elaboration score consisted of a score of one for the primary and minimum response plus one score each for every additional new idea. An idea once scored in a picture was not scored again in the same picture.

Originality :

Originality is represented by uncommonness of a given response. The procedure for scoring originality was same as it has been used for the verbal form of the test.

The titles were to be scored for elaboration and to be considered as verbal rather than non-verbal. But, as there was a wide scope for elaboration scoring in the entire non-verbal form of the test, the elaboration scoring for titles was ignored.

In the same way, the originality scores for titles have been considered as verbal rather than non-verbal. The titles have been evaluated for originality on the

basis of the following scheme.

(1) A zero score was given to a title, if it was just named as man, elephant, ink-pot, camel etc.. These were obvious common 'thing' titles.

(2) A score of one was given to a title such as 'A good book', 'A beautiful girl'. 'A hungry dog' etc. In this types of titles the object was described in somewhat elaborate terms.

(3) A score of two was given to a title which was more imaginative such as, 'Flowers in the sky', 'A queen of the ocean' etc.

(4) A score of three was given to a title which was abstract but appropriate and telling something which goes beyond what can be observed e.g. 'Birds returning after establishing peace on the battle field'.

3.5.1.6 Selection of the test-items

For selecting test items from the present pool of the test items, item relevance of each test-item was studied by scoring both the verbal and non-verbal forms of the test according to the scoring procedure. As there was no right or wrong response to each test-item and also it was not possible to find out difficulty index of each test-item, the test items were selected on the basis of the following criteria.

1. The test items in which more number of relevant responses were given by the PSTTs.
2. The test items in which high score of the key factor originality was achieved by the PSTTs.
3. The test items in which high scores of flexibility and elaboration were found.

Finally, keeping in mind the above criteria and the time factor, a total number of 31 test items were selected for the final form of the test.

3.5.1.7 The final format of the creativity test

As a result of the procedure followed for the selection of test-items, a total number of 31 test items were selected for the final format of the creativity test. As the present tool was an adapted transformation of the well-known standardized Tests of Creative Thinking (TCT) by Mehdi (1973) and Torrance (1972), the investigator has finalised the tool in respect of standardization of, (i)general instruction, (ii) informations of respondent to be obtained, (iii) time distribution to each activity, and (iv) inclusion of example related to each activity for better understanding. The final format of verbal and non-verbal forms of the test are given in Appendix-IV and Appendix-V, respectively.

The distribution of the test- items under different activities with respect to their form is shown in the table no. 3.5.

TABLE No. 3.5

Distribution of the test-items on the final format of the creativity test as per verbal and non-verbal forms

Name of the Activity	No. of test items included	Form of the test
1. Imaginative events	03	Verbal
2. Novel uses of the things	03	Verbal
3. Similarity	02	Verbal
1. Picture Construction	01	Non-verbal
2. Picture Completion	08	Non-verbal
3. Circles & Rectangles	14	Non-verbal
Total	**31**	

3.5.1.8 Psychometric properties of the creativity test

- **Validity :**

For determining the validity of the developed tool, three methods were invloved namely ; logical validity, factorial validity and concurrent validity. The details with regard to each is as follows :

Logical Validity :- Logical validity of the developed test was established. At the outset, all the accumulated knowledge on the construct was critically studied and on the basis of this, the components which constitute the construct were identified. Then, test-items were developed on each of the components. The pool of test-items were subjected to expert's judgement in terms of the validity of the construct. On the basis of the opinions, suggestions and discussions with competent persons, the items were scrutinised as well as modified. The pool of items thus arrived at, was tried out and from the tryout, the final test form was developed. Experts list can be referred from the Appendix - I.

Factorial Validity :- Garrett (1981) describes it as, "In the statistical method called factor analysis, the intercorrelations of a large number of tests are examined and if possible accounted for, in terms of a much smaller number of more general 'factors' or trait categories. The factors presumably run through the often complex abilities measured by the individual tests. It is sometimes found, for example, that 3 or 4 factors will account for the intercorrelations obtained among 15 or more tests. The validity of a given test is defined by its factor loadings and these are given by the correlation of the test with each factor. A vocabulary test, for example, may correlate 0.85 with the verbal factor extracted from the entire test battery. This coefficient becomes the test's factorial validity".

In the present study, creativity is operationalised as the construct constitut-

ing of different components which would become the factors of creativity. To estimate the factorial validity, the creativity test was administered on 40 PSTTs during the month of september, 1998. Data from the administration were analysed to estimate the factorial validity. The Pearson's product-moment correlation was calculated with the help of statistical application software 'SPSS', to find out the relationship between the total creativity score and the score of its each component respectively. The obtained correlations and the level of significance have been shown in the table no. 3.6.

TABLE No. 3.6

Variablewise values of 'r' for factorial validity and the level of significance

Sr. No.	Variables	Value of 'r'	Level of Significance
1	Total creativity score and score of fluency	0.6050	0.01
2	Total Creativity score and score of flexibility	0.4683	0.01
3	Total creativity score and score of originality	0.5180	0.01
4	Total creativity score and score of elaboration	0.6590	0.01

It can be observed from the table no. 3.6 that high coefficients reflect the

strength of each component for identifying the creativity level of PSTTs. These coefficients also justify the inclusion of these components in the test.

Concurrent Validity :- Kerlinger (1983) descirbes it as, "Concurrent validity is studied by comparing test or scale scores with one or more external variables, or criteria, known or believed to measure the attribute under study. When one predict success or failure of students from academic aptitude measures, one is considered with concurrent validity. How well does the test (or tests) predict to graduation or to grade-point average ? One doesnot care so much what the test measures as one cares for its predictive ability. In fact, in concurrent validation, which is often practical and applied research, the basic interest is usually more in the criterion, say grade-point average, the better the validity. In short, again, the emphasis is on the criterion and its prediction."

In the present study, as a part of process the Mehdi's (1973) test of creative thinking (TCT) was used after its translation from English to Gujarati. And to check whether both the versions were equally comprehensible or not, they were administered on a small sample of 10 undergraduate students of F.Y. B.Com. (1998-99), during the month of August, 1998; at an interval of fifteen days.

The Pearson's product - moment correlation was calculated to find out the relationship between the total creativity scores obtained by the students in both the versions of Mehdi's (1973) TCT. The obtained correlation and the level of significance has been shown in the table no. 3.7.

TABLE No. 3.7

Value of 'r' and level of significance in relation to total creativity scores

Variable	Value of 'r'	Level of Significance
Total Creativity score on Mehdi's (1973) TCT in English and in Gujarati	0.95	0.01

It can be observed from the table no 3.7 that high coefficient reflects the equal comprehensibility of both the versions. Thus, the equivalence was established between the two versions of Mehdi's (1973) TCT. Both the versions of Mehdi's (1973) TCT are given in the Appendix - VI and Appendix - VII respectively.

After that the Gujarati version of Mehdi's (1973) TCT was administered on 40 PSTTs of DIET - Vadodara, during the month of september, 1998. And data was collected in terms of the scores on total creativity, fluency, flexibility, originality and elaboration respectively.

To establish the concurrent validity of the tool, the Pearson's product-moment correlation was computed between the obtained scores of total creativity and its components by using the self constructed tool and the Mehdi's (1973) TCT. The obtained correlations and the level of their significance have been shown in the table no. 3.8.

TABLE No. 3.8

Variablewise values of 'r' for concurrent validity and level of significance

	Variables	Value of 'r'	Level of Significance
1.	Total Creativity scores on constructed tool & Mehdi's (1973) TCT	0.5955	0.01
2.	Scores of Fluency on constructed tool & Mehdi's (1973) TCT	0.4249	0.01
3.	Scores of Flexibility on constructed tool & Mehdi's (1973) TCT	0.6324	0.01
4.	Scores of Originality on constructed tool & Mehdi's (1973) TCT	0.5432	0.01
5.	Scores of Elaboration on constructed tool & Mehdi's (1973) TCT	0.6613	0.01

It can be observed from the table no. 3.8 that high coefficients reflect the adequate emphasis on the criterion and its prediction in the creativity test. Thus, the validity of the self constructed tool was ensured, and the another important psychometric property of the tool, 'Reliability' is discussed in the following section.

- **Reliability** :- The reliability of the self constructed tool was estimated by split-half technique as ;

(i) one of its main advantages is the fact that all data for computing reliability are obtained upon one occasion; so that variations brought about by differences between the two testing situations are eliminated.

(ii) it requires one form of a test, there is no time lag involved, and the same physical and mental influences will be operating on the subject.

The reliability of the tool as calculated by split-half method was found to be

0.5915. The test was first divided into two equivalent halves by considering the following criteria:

1. All the test-items under the activities in both the forms of the test were distributed according to odd and even numbers into two halves.
2. In case of activity - 3 of non-verbal form of the test, it was considered as a single test-item for the purpose of calculating split-half reliability.
3. In both the forms of the test, all test-items were considered in a sequencial order, respectively.

While distributing the test-items under each activity on the basis of above specific criteria, their comparability was also ensured. The distribution of the test items into two halves is shown in the table no. 3.9.

TABLE No. 3.9

Distribution of test-items of the creativity test into two halves

Form of the test	Activity	First half (I)	Second half (II)
		(Test item no.)	
Verbal	1. Imaginative events	1,3	2
Verbal	2. Novel uses of the things	5	4,6
Verbal	3. Similarity	7	8
Non-verbal	1. Picture Construction	1	2
Non-verbal	2. Picture Completion	3,5,7	4,6,8
Non-verbal	3. Circles & Rectangles	9	10
	Total :	**09**	**09**

From the reliability of the half test, the self correlation of the whole test was then estimated by the Spearman - Brown prophecy formula. The correlation coefficient for the half test was 0.4200. Thus, the value of reliability coefficient of the whole test was found to be 0.5915.

Thus, the constructed tool has been standardized by establishing its validity and reliability, to measure the creativity level of PSTTs. After that, preparation of creativity programme has been undertaken, the details of which is as follows :

3.5.2 Preparation of the creativity programme (CP) : (Tool No. 2)

As the second significant tool for the present study, the investigator has prepared a creativity programme (CP) for PSSTs with a view to develop and enhance the creativity level of PSTTs. Perhaps, creativity is difficult to teach in a direct way, but it is a matter of experience, and hence, the investigator has attempted in the present study to construct situations for PSTTs to experience creativity and then recognise creative efforts and products. These elements - 'experiencing creativity', 'develpoing skills of constructing situations for exercise of creative talents', and 'recognising creativity form' are the very foundation of creativity programme for PSTTs. One purpose of creativity programme is thus, to provide experience in creativity and development of creative talents in PSTTs; the second purpose is to equip the PSTTs with theoretical knowledge and practical skills in developing creative talents in the coming generation.

Preparation of the CP for PSTTs, has been described under two distinct parts, which are as follows :

(i) Content of the CP

(ii) Methodology.

(i) Content of the CP :- As a major task of the present study, the investigator has developed 125 sub-activities under 52 activities as a part of the CP by taking help of the experts in the field. For some of the activities, the related reference materials were also prepared. The content of the CP was based on primary school subjects like Gujarati, Maths, Environmental Study, Science, Hindi, English, Social Study, Physical Education & Yoga, Drawing, Music and the existing curriculum of the PSTE - course in terms of effective classroom interaction, teaching methodology. lesson planning etc, as cardinal position.

(ii) Methodology :- The developed sub-activities were classified under different school subjects. Then all the sub-activities and prepared reference materials were discussed subjectwise with a panel of two experts with respect to their appropriate-ness, relevance, capacity to describe creativity and its components, and applicability of the activities in prescribed limit of time. Based on their suggestions, all those activities and reference materials requiring modifications were rewritten by the investigator. The list of the experts can be referred from the Appendix - I and the CP with detailed information can be referred from the Appendix - VIII. Thus, finally the CP was prepared by keeping in view the following criteria.

(i) As the medium of instruction in PSTE course is Gujarati, the CP was prepared in Gujarati only.

(ii) As the sample selected for the experimentation was from the first year PSTE only, and there is a prescribed curriculum they have to undergo only with the content area of std. I to IV, hence while preparing the CP these aspects were emphasized more.

(iii) As the CP was to be implemented as a special treatment for creativity development of PSTTs, it was prepared in the form of different activities with

examples, exercises, and workshop schedules.

(iv) While constructing various activities of the CP, the four components of creativity viz. fluency, flexibility, originality and elaboration were kept in mind.

(v) All the activities prepared under the CP were based on various techniques for creativity development, as they have been proved very effective in developing creativity, by many researchers.

(vi) The CP was to provide a direction to PSTTs for developing creativity among the students in context with the competency based approach implemented at primary level, in the state of Gujarat.

3.5.2.1 Description of the creativity programme

The subjectwise description of all the activities of the creativity programme with respect to their titles, total number of sub-activities, approach to be adopted, components which can be developed and the related techniques for creativity development is shown in the table no. 3.10.

TABLE No. 3.10

Description of all the activities of the CP in relation to subject, approach used, components of creativity, and related techniques used.

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
1	Encouraging activities	4	- Maths - Science - En. Study - Competencies related to classroom interaction.	Activity based	F, Fl, O	✦ Gaming (learning through play & learning by doing.) ✦ Divergent thinking
2	Mathematical Concepts - I	4	- Maths - Competencies related to classroom interaction.	Activity based	F, Fl, O	✦ Brain Storming ✦ Divergent thinking
3	Mathematical Concepts - II	2	- Maths - Competencies related to classroom interaction.	Activity based	F, O	✦ Problem solving ✦ Self discovery.
4	Number Game	7	- Maths - Competencies related to classroom interaction.	Activity based	F, Fl, O	✦ Divergent thinking
5	Mathematical Calculations	5	- Maths - Competencies related to classroom interaction.	Activity based	F, O	✦ Divergent thinking ✦ Brain storming
6	Checking of Mathematical Calculations	1	- Maths	Activity based	F, O	✦ Divergent thinking ✦ Self Discovery
7	Use of Similar digits	5	- Maths - Competencies related to classroom interaction	Activity based	F, O	✦ Divergent thinking ✦ Problem solving ✦ Brain storming
8	Unique fractions	1	- Maths	Activity based	F, O	✦ Divergent thinking ✦ Brain storming
9	Playing with shapes	1	- Maths (Geomatry) - Competencies related to classroom interaction	Activity based	F, O	✦ Gaming ✦ Divergent thinking

(Table 3.10 contd.)

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
10	Interesting games with match sticks	3	- Maths (Geomatry) - Competencies related to classroom interaction	Activity based	F, O	✦ Gaming ✦ Brain storming
11	Puzzle solving	5	- Maths (Geomatry) - Competencies related to classroom interaction	Activity based	F, O	✦ Brain storming
12	Geometrical reference	1	- Maths (Geomatry) - Development & use of T.L.M.	Activity based	F, O	✦ Gaming ✦ Self discovery
13	Playing with words	3	- Gujarati - En. Study - Competencies related to classroom interaction - Development and use of T.L.M.	Activity based	F, FI, O	✦ Gaming ✦ Divergent thinking
14	Pleasure with language	5	- Gujarati - Environmental study - Competencies related to classroom interaction	Activity based	F, FI, O	✦ Gaming ✦ Divergent thinking ✦ Redefinition question ✦ Convergent thinking ✦ Provocative questions
15	Language - Puzzle	1	- Gujarati - Maths - Competencies related to classroom interaction	Activity based	F, O	✦ Gaming ✦ Convergent thinking ✦ Brain storming
16	Flow of thoughts	2	- Gujarati - Competencies related to classroom interaction	Activity based	F, FI, O, E	✦ Convergent thinking ✦ Creative writing ✦ Divergent thinking
17	How can I become a Poet ?	2	- Gujarati - Competencies related to classroom interaction - Environmental study	Activity based	F, FI, O	✦ Creative writing ✦ Divergent thinking
18	Completion of Poem	1	- Gujarati - Competencies related to classroom interaction	Activity based	F, FI, O	✦ Creative writing

(Table 3.10 contd.)

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
19	Dramatization of a Lesson	1	- Gujarati - Hindi - En. Study - Soc. Study - Maths - English - Competencies related to classroom interaction - Competencies related to value education.	Work shop	F, O, E	✦ Creative writing
20	Script writing (Mono acting)	2	- Gujarati - Soc. Study - Competencies related to classroom interaction	Work shop	F, O, E	✦ Creative writing ✦ Role playing
21	Value based events	8	- Competencies related to life oriented educational activities	Activity based	F, O	✦ Gaming ✦ Divergent thinking ✦ Creative writing
22	Developing a story	3	- Gujarati - En. study - Competencies related to classroom interaction and life oriented educational activities	Activity based	F, Fl, O, E	✦ Creative writing ✦ Divergent thinking
23	Story-writing for children	1	- Gujarati - En. Study - Maths Hindi - Science - English	Workshop	F, Fl, O, E	✦ Creative writing
24	Story - telling	1	- Gujarati - En. study - Maths - Competencies related to classroom interaction and life oriented education activities	Workshop	F, Fl, O, E	✦ Gaming ✦ Presentation
25	Educational games	2	- Gujarati - Maths - En. Study - Competencies related to Classroom interaction.	Activity based	F, Fl, O, E	✦ Gaming ✦ Presentation
26	Couplets	1	- Gujarati - Maths - En. Study	Activity based	F, Fl, O	✦ Creative writing
27	Let us Create .....!	11	- Gujarati - Maths - En. Study - Drawing - Science - English - Competencies related to	Workshop	F, Fl, O, E	✦ Gaming ✦ Divergent thinking ✦ Attribute listing

(Table 3.10 contd.)

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
			classroom interaction and Development & use of T.L.M.			✦ Attribute Listing
28	Riddles writing	1	- Gujarati - En. Study - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Creative writing
29	Lyric writing	3	- Gujarati - Maths - En. Study - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Creative writing
30	Group making	1	- Science - En. Study - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Gaming ✦ Divergent thinking
31	Discovery (Demonstration / laboratory) lesson plan	1	- Science , Maths - Competencies related to Classroom interaction.	Workshop	F, Fl, O	✦ Self discovery and Guided discovery ✦ Discovery Questioning
32	Word construction and idioms	3	- Hindi - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Gaming ✦ Divergent thinking ✦ Convergent thinking
33	Reflective thinking	3	- Hindi - Competencies related to Classroom interaction.	Activity based	F, Fl, O, E	✦ Convergent thinking ✦ Creative writing ✦ Synectics (Fantacy/ Personal analogy)
34	Titles to the given dialogues	1	- Hindi - Competencies related to Classroom interaction.	Activity based	F, O	✦ Divergent thinking
35	Dialogue writing	1	- Hindi - Competencies related to Classroom interaction.	Activity based	F, O, E	✦ Creative writing
36	Story writing	1	- Hindi - Competencies related to	Activity based	F, Fl, O, E	✦ Creative writing ✦ Divergent thinking

(Table 3.10 contd.)

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
			Classroom interaction.			
37	Titles and Words	2	- Hindi - Competencies related to Classroom interaction.	Activity based	F, O	✦ Gaming ✦ Divergent thinking
38	Completion of Poem	1	- Hindi - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Creative writing
39	Picture based poetry writing	1	- Hindi - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Creative writing
40	While playing	2	- Hindi - Competencies related to Classroom interaction.	Activity based	F, O	✦ Gaming
41	Spelling game	6	- English - Competencies related to Classroom interaction.	Activity based	F, Fl, O	✦ Gaming ✦ Divergent thinking
42	Verbal description	1	- English - Competencies related to Classroom interaction.	Activity based	F, O	✦ Creative writing
43	Compositions	1	- Music - Competencies related to Classroom interaction & life oriented educational activities	Workshop	F, O, E	✦ Divergent thinking ✦ Presentation
44	Education of Yoga through Music and songs	1	- Physical education & Yoga - Competencies related to life oriented educational activities	Workshop	F, O, E	✦ Presentation
45	Combination of Geometrical shapes	2	- Drawing - Gujarati- Maths - Enviornmental study - Competencies related to	Workshop	Fl, O, E	✦ Divergent thinking ✦ Gaming

(Table 3.10 contd.)

Sr. No.	Title of the Activity	Total no. of Sub-activities	Related Subjects	Approach used	Components of Creativity	Related Techniques
			Classroom interaction.			
46	Words and Pictures	1	- Drawing - Gujarati- Maths - Enviornmental study - Competencies related to Classroom interaction.	Workshop	F, Fl, O, E	✦ Divergent thinking ✦ Gaming
47	Flow of imaginative power	1	- Drawing	Workshop	F, Fl, O	✦ Divergent thinking ✦ Provocative question
48	Preparation of Picture worksheets	1	- Drawing - Gujarati- Maths - Enviornmental study - Competencies related to Classroom interaction.	Workshop	F, Fl, O, E	✦ Divergent thinking
49	Pictorial presentation	3	- Drawing	Workshop	E, O	✦ Divergent thinking
50	Awareness through pictures and sloguns	2	- Drawing - Gujarati- En. Study - Conceptual competencies - Contextual competencies - Competencies related to life oriented educational activities	Workshop	F, O, E	✦ Creative writing ✦ Divergent thinking
51	Pictorial story	1	- Gujarati- En. Study - Drawing - Competencies related to life oriented educational activities and classroom interaction.	Workshop	F, Fl, O, E	✦ Creative writing ✦ Divergent thinking
52	Tangram	1	- Gujarati- En. Study - Drawing - Competencies related to life oriented educational activities and classroom interaction.	Activity based	F, Fl, O	✦ Gaming ✦ Divergent thinking

It can be observed from the table no. 3.10 that the various activities included in the CP were related to the different techniques for creativity development viz. divergent thinking, brain storming, problem solving, creative writing, gaming (learning through play and learning by doing), questioning, self - discovery and guided discovery, synectics, attribute listing, role playing etc. Also out of the total **52** activities, **15** activities were based on workshop approach, whereas **37** activities were based on activity based approach. The creativity programme, used in the present study for the experimentation is given in the Appendix - VIII, with detailed information.

As the creativity programme was related to the above mentioned techniques and aimed at developing creativity with respect to its components viz. F, Fl, O and E - it seems that there would be a wide scope for laying good foundation for creative thinking and opportunities and a proper direction to the PSTTs, to use their creative abilities while its implementation. Thus, the CP was prepared and implemented, the procedure of which is described in the next section 'procedure of data collection'.

3.6 PROCEDURE OF DATA COLLECTION

The experimental procedure for the study included all the works beginning from matching of the groups till data collection. This work was carried out in three phases, the details of which are described below :

Phase - I (Pre - test)

During this phase, the data pertaining to scores on creativity and its components was collected by administering the creativity test on PSTTs of the experimental and control groups, as a pre - test.

But, prior to the pre-test, the two groups, namely, experimental and control were needed to be equated on the variable such as, 'Previous Scholastic Achievement (PSA)'. To match the two groups on PSA, their marks in the XIIth examination were collected from their respective DIET. From the scores on PSA obtained by PSTTs, means and standard deviations were computed. The **t - test** of significance was then applied to determine the significance of difference between the means of the scores on PSA. Means, standard deviations, and t - value for the same are presented in the table no. 3.11.

TABLE No. 3.11

Means, standard deviations, and t - value for Previous Scholastic Achievement (PSA) of PSTTs

PSA of PSTTs	N	Mean	S.D.	t - value
Experimental group	46	72.15	7.02	1.434*
control group	43	74.3	6.5	

*** Not significant at 0.01 level**

From the table no. 3.11, it is clear that the calculated t - value is not significant at 0.01 level. This shows that the two groups did not differ significantly on previous scholastic achievement. Thus, the two groups were equated for experimentation.

After that, to administer the pre-test, initially the principals of both the DIETs were consulted to seek their permission to collect the data and were informed that the investigator would visit their DIET to administer the test on any working day between 1st to 13th of August, 1999. Accordingly, the investigator had administered the tool to all the PSTTs who were present at their respective DIET, to obtain the data.

The following points were kept in view before administering the test :

- The appropriate place for administering the test was decided, so that the PSTTs could work comfortably and without any disturbance.
- A stop watch was arranged for timing each activity of the test.
- The administration of both the forms of the test, i.e. verbal and non - verbal, were arranged in two different sittings on the same day, at an interval of two hours between the two sittings.
- It was confirmed that each PSTT has available with him a pen, a pencil, an eraser and a sharpner as per the requirement.
- The PSTTs were properly motivated by telling them about the test, as a set of interesting activities which would be enjoyable.

Prior to administration of the verbal form of the test the PSTTs were asked to fill up their informations against the space provided for it on the first page of the test booklet. Then, the PSTTs were made aware about the purpose of the administration of the test and asked to read the printed instructions on the second page of the test booklet. They were informed to ask the investigator whenever they find any word or statement difficult to comprehend in the activity. They were also informed to respond according to their own belief as there was no right or wrong answer of any test - item under the activity.

After completing such introductory formalities, the PSTTs were allowed to give their responses to the activities. They were informed about the timings of the activities with the help of stop watch. Almost all the PSTTs were able to complete their responses to the test within the prescribed time limit. The PSTTs were reminded to ensure that they have responded all the activities of the test.

At the end, extra five minutes was given so that they could add some new ideas in their responses. Then the investigator had collected all the test - booklets from the PSTTs. In the same way, the non-verbal form of the test was also administered.

The PSTTs were guaranteed about the confidentiality of the informations collected and about its use only for research purpose.

Phase - II (Treatment)

In this phase the creativity programme was conducted on the experimental group for 45 days i.e. from 16th of August, 1999 to 29th of September, 1999; as a treatment, whereas the control group was not given any treatment. As PSTE course is a compulsory residential training programme, the CP was implemented daily for one hour in the morning from 8 to 9 A.M. , from monday to saturday and atleast for five hours i.e. from 11-30 A.M. to 5 P.M., on every sunday and public holiday.

Prior to implementation of the CP, the following preparations were made :

- A schematic presentation for conducting of the CP was prepared.
- The conduct of activities based on workshop approach, were scheduled on sundays and on public holidays. A half an hour break was given for refreshment during that time.
- The sufficient number of copies of the activity worksheets and reference materials for the activities based on workshop approach, were prepared.
- Some transparencies were also prepared for the pictorial presentation of some picture based activities.
- The essential materials for the related activities were purchased and/or collected to distribute among the PSTTs.

- All the PSTTs were informed well in advance, to collect all types of available waste materials from their surroundings to develop their skill of "Making best out of the waste".
- The experts who had given their contribution in preparing and validating the CP, were invited to work as resource persons or experts during the implementation of the CP, keeping in mind the vital role of the mentors in developing creative ability.
- The arrangements were made to call the subject resource persons at their ease to take the advantage of their guidance.
- The PSTTs were provided a fullscape note book to give their responses of the activities, of the CP.
- The PSTTs were motivated to participate actively and regularly during the implementation of the CP and to develop their skill according to the guidance and direction provided.

After the above pre-planning , the implementation of the CP was commenced from 16th of August, 1999. It was implemented with the help of experts. The investigator had fulfilled the requirement of both, the convener and an expert. The implementation of the CP was based on two types of approaches namely; (i) activity based approach, and (ii) workshop approach ; details of which are provided below :

(i) Activity based approach :

Under this approach, according to the schematic presentation all the PSTTs were provided the activity worksheet and the related materials as mentioned in it. The PSTTs were informed to read the instructions carefully and to do the activities

according to the given examples in the worksheet. They were also informed to ask the investigator or the resource person whenever they find any word or statement difficult to comprehend. During the treatment , they were also motivated and guided to prepare more activities on the line of the given example in the worksheet.

(ii) Workshop approach :

Under this approach, according to the schematic presentation, all the PSTTs were provided the prepared reference material related to the activity, alongwith the activity worksheet. After that, the expert had given the comprehensive explanation of the same by relating it with the given example or with the direct performance. During the treatment, the PSTTs were facilitated with the guidance, supervision and motivation of the experts.

During the entire phase of this treatment the following points were given prime importance.

- The PSTTs were encouraged to work individually or in the group according to the activity, and to think divergently.
- Each and every trainee was given an opportunity to present his novel, innovative and sprouted ideas.
- The follow- up work or exercise which was expected to be done in some of the activities, were guided , supervised and encouraged.
- The proper guidance was given to the PSTTs at any time during this phase, related to any activity.

Thus, the implementation of the CP was completed as a treatment according to the schematic presentation shown in the table no. 3.12.

TABLE No. 3.12

Schematic presentation of the treatment given to the experimental group

Date	Treatments		Time Duration
	Activity No.	Title of the Activity	
16-8-99	1	Encouraging Activities	One hour
17-8-99	13	Playing with words	One hour
18-8-99	30	Group making	One hour
19-8-99	41	Spelling game	One hour
20-8-99	32	Word construction & idioms	One hour
21-8-99	2	Mathematical Concepts - I	One hour
22-8-99	31	Discovery (Demonstration / Laboratory) Lesson - plan	Five hours
23-8-99	14	Pleasure with language	One hour
24-8-99	21	Value based events	One hour
25-8-99	26	Couplets	One hour
26-8-99	-	-	-
27-8-99	40	While playing	One hour
28-8-99	42	Verbal description	One hour
29-8-99	43	Compositions	Five hours
	44	Education of yoga through music & songs	
30-8-99	3	Mathematical Concepts - II	One hour
31-8-99	4	Number game	One hour
1-9-99	15	Language puzzle	One hour

TABLE No. 3.12 (Contd.)

Date	Treatments		Time Duration
	Activity No.	Title of the Activity	
2-9-99	28	Riddles writing	One hour
3-9-99	23	Story writing for children	Five hours
4-9-99	33	Reflective thinking	One hour
5-9-99	24	Story telling	Five hours
6-9-99	34	Titles of the given dialogues	One hour
7-9-99	5	Mathematical calculations	One hour
8-9-99	16	Flow of thoughts	One hour
9-9-99	29	Lyric writing	One hour
10-9-99	35	Dialogue writing	One hour
11-9-99	6	Checking of mathematical calculations	One hour
12-9-99	45	Combinations of Geometrical shapes	Five hours
	46	Words & pictures	
	47	Flow of imaginative power	
	49	Pictorial presentation	
13-9-99	48	Preparation of picture work-sheets	Five hours
	50	Awareness through pictures & sloguns	
	51	Pictorial story	
14-9-99	17	How can I become a poet ?	One hour

TABLE No. 3.12 (Contd.)

Date	Treatments		Time Duration
	Activity No.	Title of the Activity	
15-9-99	11	Puzzle solving	One hour
16-9-99	25	Educational games	One hour
17-9-99	36	Story writing	One hour
18-9-99	7	Use of similar digits	One hour
19-9-99	27	Let us create ..... !	Five hours
20-9-99	39	Picture based poetry writing	One hour
21-9-99	18	Completion of poem	One hour
22-9-99	37	Titles and words	One hour
23-9-99	8	Unique fractions	One hour
24-9-99	22	Developing a story	One hour
25-9-99	38	Completion of poem	One hour
26-9-99	19	Dramatization of lesson	Five hours
	20	Script writing (Mono acting)	
27-9-99	9	Playing with shapes	One hour
	10	Interesting games with match sticks	
28-9-99	12	Geometrical reference	One hour
29-9-99	52	Tangram	One hour
		Total :	**76 hours**

Phase - III (Post - test)

For the data pertaining to scores on total creativity and its components

(F, Fl, O, and E), the creativity test was administered as a post-test on PSTTs of both the groups, during the 1st week of October, 1999. The procedure for administration, scoring, and collecting the data was in the same fashion as it was applied in the phase - I.

Thus the data was collected for the experimental and control groups in terms of pre and post test's scores on total creativity and its components, F, Fl, O and E respectively, can be seen in the Appendix-IX.

3.7 PROCEDURE FOR ANALYSIS OF THE DATA

The collected data were analysed through appropriate statistical techniques. To standardize the constructed tool in the present study, the Pearson's product - moment correlation technique and split-half technique were applied. Data obtained as PSA of the PSTTs was analysed with the help of means, standard deviations and t-test. To study the difference between the pre and post test's mean scores on creativity, fluency, flexibility, originality, and elaboration respectively, of the experimental and control groups, Analysis of Covariance (ANCOVA) was applied by taking the pre-test score of the respective variable as a covariate. ANCOVA was applied with the help of statistical application software - 'SPSS'. To study, any differential impact of the CP on the mean creativity score of the PSTTs of different caste-category and academic stream, Two-way- Analysis of variance (ANOVA) was applied with the help of SPSS.

The entire programme of the present piece of research, presented in this chapter provides a clear cut direction for the work and thus sets the stage for analysis. Such an analysis would lead to churning out the cream of the work. In other words, to study the effectiveness of the implementation of the CP, on the level of creativity of PSTTs in relation to its components and other variables, which can be seen through the data analysis. This is the subject matter for the forthcoming chapter.