DESIGN OF THE STUDY
CHAPTER-III

Design of the study

3.1 Methodology of the Present Research:

The present study was concerned chiefly with identifying the classroom interaction styles of B. Ed trainees and exploring and estimating the possible relationships between interaction styles and the two important personality variables as identified in terms of locus of control and self efficacy. The design of study was based on ex-post facto method which requires and mandates the analysis of relationships among variables as already available and determined in the research situation. As against experimental method where the independent variable is subject to manipulation by the investigator, in such a design the effect of independent variable is perceived as already existent. In the frame work of this research locus of control and self efficacy have been stipulated as independent variables and classroom interaction style of B. Ed trainees as the dependent variable. Thus, the purpose of the study was to examine whether any possible relationship can be set up between locus of control and self efficacy of student-teachers on the one hand and their classroom interaction style on the other.

These variables were defined on the basis of the conceptual anchors and explanations available through the researches of Rotter (1966) for locus of control, Bandura (1977, 1986) for teaching efficacy and Ned Flanders (1963, 1965) for classroom interaction analysis.
3.2 Population and Sample of the study:

In a hypothetico deductive research context as of the present study population constitutes any defined whole or aggregate to which the probe relates whereas the sample frame is a cross section taken from the population to represent it. In the present study the population was defined as the entire state of Jharkhand in which the teacher education sector of B.Ed. self financing institutions has been established under the provision of universities jurisdiction and which have been duly recognized by the N.C.T.E. an apex body at the national level for according formal permission to run the B. Ed. courses. In the state of Jharkhand there are 105 B.Ed. Teacher education institutions at present recognized by N.C.T.E. These institutions are affiliated to the five state universities indicated below;

1. Ranchi university, Ranchi
2. Vinoba Bhave university, Hazaribag
3. Siddo-Kanho university, Dumka
4. Kolhan university, Chaibasa
5. Nilambar Peetamber university, Palamu

From these universities of the state viz Ranchi university, Ranchi, Vinoba Bhave university, Hazaribag, Siddo-Kanho University, Dumka, Kolhan University, Chibasa and Nilambar Peetamber university, Palamu, only one university i.e Vinoba Bhave university of Hazaribag has been selected for the study and the same has been designated as the sample
frame. In this university there are 35 teacher education colleges which have the approval of N.C.T.E. and out of which 34 are self financing and only one is government sponsored college. The intake of B.Ed. trainees has been restricted to 100 in each self financing institution as the formally approved strength for B. Ed admissions. The researcher selected three of such colleges from this university using a purposive sample technique. The details in respect of these colleges along with their intake strength for B. Ed is as indicated in table 3.1.

Table 3.1 Details in respect of the colleges forming the sample

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Name of college</th>
<th>Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Gautam Budha Teacher training college, Hazaribag</td>
<td>100</td>
</tr>
<tr>
<td>02</td>
<td>Grizzly college of Education, Jhumri telaiya , Koderma</td>
<td>100</td>
</tr>
<tr>
<td>03</td>
<td>Jagannath Jain College , Jhumri telaiya , Koderma</td>
<td>100</td>
</tr>
</tbody>
</table>

The location of these colleges under the Vinoba Bhave University, Hazaribag in the state of Jharkhand has been shown through the map which figures opposite this page:
Figure 3.1 – Location of the Colleges and the University selected for sample frame
It may be pointed out that the 300 B.Ed. trainees who were admitted in the academic session 2012-13 constitute the target sample frame for the present research. The sample so identified may be considered as fairly representative of the defined population of B.Ed. self financing colleges in the state.

Out of these three colleges forming the sample frame, 20 B.Ed. trainees were randomly selected from each college. The table 3.2 embodies the strength of sample drawn from the colleges.

**Table : 3.2 Structure of the sample for the study**

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Name of the institution</th>
<th>Composition of B.Ed. student-teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys (10)</td>
</tr>
<tr>
<td>01</td>
<td>Grizzly College of Education, Jhumri Telaiya, Koderma</td>
<td>60(10)</td>
</tr>
<tr>
<td>02</td>
<td>J.J B.Ed. College, Jhumri Telaiya, Koderma</td>
<td>65(10)</td>
</tr>
<tr>
<td>03</td>
<td>Gautam Buddha T.T. College, Hazaribag</td>
<td>60(10)</td>
</tr>
</tbody>
</table>

The number in the parentheses indicates the sample selected from each college gender wise.

It may be stated on the basis as table 3.2 that the number against each column indicates the intake of B.Ed. students as finally fixed and approved for the colleges by the university and the numbers in the parentheses indicate the randomly drawn 10 B.Ed. student-teachers from each teaching subject constituting the sample. Each student teacher’s classroom interaction styles as recorded for a duration of fifteen minutes multiplied by sixty constitutes as the adequate sample of the universe of
behaviour. Thus, in all 15x60 units which comes to a duration of 900 minutes is the actual sample of behaviour relied upon. This could not be expanded further for the reasons of paucity of resources on the one hand and the cost and manageability factors involved. The researcher considers this as a dependable sample of the classroom interaction style acquired/developed by the concerned student- teachers who were in all 60 in number 30 boys and 30 girls.

Thus in all 30 male and 30 female students of B.Ed. finally constitute the sample for the study of the three variables and their inter-relation in terms of the design of the research.

3.3 Tools used in the study:

As pointed out earlier the three main tools used for the study were that of Ned Flanders’ interaction analysis category (FIAC), a self constructed scale for measuring locus of control and a test of self efficacy developed and standardized by the researcher himself.

In the following section a detailed description of FIAC has been provided with a view to focus on the interaction variables which have been studied in order to disclose the interaction styles.

3.3.1 NED Flanders’– Interaction Analysis categories

It may be stated that as at present hundreds of various systems of interaction analysis are available and many more are being developed. It is important to understand and explain why a particular system should be used as observational systems may be inter alia different from each other on the following basis.

(I) Purpose of observation or focus
(II) Encoding Procedure

(III) Content to be subjected to observation

(IV) Analysis of data

No system can be described as fool proof. Each one has its own limitations and may be considered appropriate for a particular set of situations /condition. The criterion for selecting or creating an appropriate system has to be swayed by the following considerations:-

(a) **Validity of observations**: The observation system should measure the intended student/teacher behaviours as an unambiguous observational item which should reflect the reality of classroom communication. The user must be clear in his mind as to what kind of conditions and as to what extent the observational items of a particular system are relevant to the objective.

(b) **Reliability of observation**: In order to generalize about the patterns of classroom communication, the interaction has to be consistently encoded. Consistency in observations can be attained if the observer is well trained and is consistent in his or her perception of behaviour. When more than one observer is employed for data collection, consistency must be maintained between or among two or more observers. For purposes of internal consistency the unambiguous items in an observational system can ensure accurate interpretations; the index of reliability through using Scott’s formula is as follows:

\[
\text{Reliability} = \frac{Po - Pe}{1.00 - Pe}
\]
\[
\frac{\text{Total agreement between observers} - \text{Chance agreement}}{\text{Greatest possible agreement} - \text{Chance agreement}}
\]

In any system to be employed for classroom interaction, observation must be usable and must yield useful data which could be easily interpretable. Medley and Mitzel (1963) point out that a category system is preferable when there is only one aspect of behaviour to be studied. When several aspects of behaviour are of equal importance and also when it is not known which aspects are important, the sign approach is preferable. Also it is now evident that category systems have been relatively more popular on the basis of their usability and their amenability to yielding data useful for more complex analysis.

In should also be borne in mind while selecting an observation system that these do not evaluate but provide data that can be helpful in evaluation, but in and of themselves, are not evaluative instruments. Hence, one of the most important aspects of learning to use an observational system is learning to use the results. The data obtained by these observational systems may provide meaningful feedback to teachers as it can provide teachers an opportunity to compare their performance with their intentions or objectives which would form a basis for behaviour modification. The ultimate value of observation system is, however, the use a teacher makes of the skills and awareness he develops. Therefore, the basic qualification of an observational system will depend upon its capability to help operationalize teaching objectives into teaching strategies.

Flanders and his associates developed a classroom observational system at the University of Minnesota between 1955 and 1960. An attempt
has been made through this system to classify all forms and facets of verbal behaviour to be found in the classroom interaction. Flanders’ system investigates primarily the verbal behaviour of a teacher and students in a classroom setting in order to enhance understanding and thus to improve teaching behaviour (Amidon and Flanders 1971). The Flanders’ system is composed of ten categories of verbal behaviour. These are divided into major parts: - Teacher Talk (TT), Pupil Talk (PT) and silence and confusion (Sc).

The first main part is subdivided into two - indirect and direct teacher talk. This qualification gives central attention to the amount of the freedom that teacher grants to the students. In a given situation, therefore, a teacher has a choice. Indirect teacher statements are those that give students greater opportunity to respond or maximize students' freedom of action. They include the following verbal behaviours: accepting feelings (category-1), praising or encouraging (category-2), indicating an acceptance of students ideas by paraphrasing, restating, or summarizing what they have said (category-3) and asking questions (category-4). In contrast to indirect teacher talk, direct teacher statements are those which tend to restrict or minimize students’ freedom of action. They include extended lecturing (category-5), giving directions for student compliance (category-6), and criticizing or justifying authority (category-7) by telling students to change their behaviour. These first seven categories are used when teacher is talking. The teacher’s choice conscious or unconscious depends upon many factors. It emanates from his perception and the situations and the goals of the particular learning situations.

The second main part is divided into only two categories. Pupil-talk response (category-8) and pupil initiation (category-9). Pupil talk response
includes students’ responses to teacher’s questions that may be narrow or convergent. Pupil talk initiation category is meant for verbal behaviour which may be an expression of a student’s own opinions, ideas and inquisitiveness. This type of behaviour may occur as a result of broad or divergent questions.

The third part of the system is composed of a single category of silence/confusion (category -10), This includes all behaviours, not covered above along with silence and garbled or unambiguous classroom communication.

The FIAC has been summarized in table -3.3

**Table 3.3 Summary of Flanders’ Interaction analysis categories (FIAC)**

<table>
<thead>
<tr>
<th>Teacher Talk</th>
<th>Indirect Influence</th>
<th>Direct Influence</th>
<th>Pupil Talk</th>
<th>Pupil Talk –response</th>
<th>Pupil talk- initiation</th>
<th>Silence or confusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3. Accepts or uses pupil ideas</td>
<td>7. Criticizing or Justifying authority</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Asks questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assumptions inherent in Flanders’ system of interaction analysis may be indicated as follows :

(I) In a normal classroom situation it is verbal communication which is predominant. Probabilities are, in any school classroom better than 60% that one would hear someone talking (Flanders -1965).

(II) Verbal behaviour can be observed with higher reliability than most of the non-verbal behaviours and also it can reasonably serve as an adequate sample of the total behaviour in the classroom.

(III) The teacher exerts a great deal of influence on the pupils. The pupil behaviour is affected to a great extent by the type of teacher behaviour exhibited (Anderson et. al . 1946):In other words teachers classroom behaviour in particular exerts a crucial influence on pupils( Flanders 1960)

(IV) Changing teacher classroom behaviour through feedback is possible (Flanders 1963) though the amount and the nature of change will require research (Flanders 1963, 1968). The implication is that teachers can control their verbal participation in the classroom and use it as a psychological force in classroom management.

Observation Procedure :

Flanders system of interaction analysis is employed by a trained observer where he/she is using a live classroom or tape recorded scripts of his interactions. It is desirable to take about five minutes to get acclimatized to the classroom situation and start recording. This recording is called encoding process. It is done by noting down every three seconds the category number of the interaction, he/she has just observed. The
observer records these numbers in a sequence in a column. Twenty numbers per minute would, thus, be recorded. Therefore, at the end of a period of time several long columns may be obtained. It is important to keep the tempo as steady as possible, but it is even more crucial to be accurate, marginal notes may also be mentioned, which may be useful in explaining the classroom events. Once an observer memorizes the category and practices them on transcripts of dialogue and live examples, use of the system becomes fairly automatic. Flanders suggested that 6 to 10 hours of practice to an observer can equip him in making appropriate judgments easily and consistently. The procedure as indicated here, has been adhered to in the present research as such.

**The Ground Rules:**

In order to overcome complexity of problems involved in categorization several ground rules have been established. These rules are helpful in obtaining consistency in observing classrooms in different subject areas and grade levels. In using this system in the present study, the following rules so evolved have been followed.

**Rule -1**

When not certain to which two or more categories a statement belongs, category that was numerically far from category 5 was chosen.

**Rule -2**

If the primary tone of teacher’s behaviour has been consistently direct or consistently indirect shifting to opposite classification was not permitted unless a clear classification of shift was given in the teacher’s presentation.
**Rule -3**

The observer’s own biases or teacher’s intent were kept under control.

**Rule -4**

If more than one category was sighted during the three seconds interval, then all categories used in that interval were recorded. Therefore, recording of each change in the category, if no change was noted within three seconds the same category number was repeated.

**Rule -5**

For silence longer than three seconds, category 10 for every three seconds was recorded.

**Preparation of observation matrix :**

Constructing an interaction based on 10x10 observation matrix from raw data from the recorded sequence of events is relatively simple and straightforward. The method consists of entering the sequence of number into a ten by ten matrix (10 rows and 10 columns table). Each number is entered in the form of sequence pairs, being used twice, firstly as the first number and secondly as second number. The rows of matrix represent the first number in the pair and the columns represent the second. In this way overlapping pairs of observations are entered in appropriate cells of the matrix. The data has to begin and end in silence i.e. category 10. If 10 was not mentioned in the beginning the observer added it at both ends.

The following example illustrates the procedure of matrix preparation followed.
Recorded sequence of classroom interaction

I\textsuperscript{st} pair III V VII IX XI XIII XV

10, 5, 4, 8, 4, 8, 6, 2, 3, 5, 5, 10, 6, 7, 7, 6, 10

Table-3.4 Example of Observation Matrix

<table>
<thead>
<tr>
<th>Cat.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I</td>
<td></td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>1</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>I</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td></td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I</td>
<td>1</td>
<td></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>16</td>
</tr>
</tbody>
</table>
The first sequence of pair 10-5 for example was tallied in the cell located at intersection of 10th row and 5th column, the next pair 5-4 was tallied in the cell located at the intersection of 5th row and 4th column and so on so forth. Each pair of number overlaps with the previous pair and each number except the first and the last is used twice. The matrix table was developed in such a way that the rows and columns for categories are proportionately sized.

For example the rows and columns for categories 5 were kept biggest; rows and columns for categories 4, 6 and 8 relatively smaller and for the rest of categories still smaller. The total in rows and columns had to be identical. It provided as the first check. A separate matrix was prepared for each specific lesson or major activity. Matrices were so constructed that they were meaningful when they represented a single type of activity of work. The various matrices were also pooled later to prepare a master matrix for a sub group. They were grouped cell wise. The pooled matrix was called the master matrix. These were required when the nature of classroom interaction of a particular type of teachers in the subject of our study was to be depicted. If two or more observations of a teacher has been taken for lessons in a particular subject, pooled matrix of these two or more lessons constituted the data of individual aggregate performance.

**Procedure followed for the Interpretation of interaction analysis data**

Amidon and Flanders (1971) have suggested that the investigator should avoid reference to matrix until he/she has formulated a question about the interaction data. Also a trained observation consultant, in the instant case the investigator himself functioned for the purpose of interpretation of data. Some probable questions considered were as mentioned below:
(1) What is the relationship of teacher talk to pupil talk?

(2) Is the teacher typically direct or indirect?

(3) How much class time was spent on lecturing?

(4) Does the teacher generally ask narrow or broad question?

(5) How does the teacher typically communicate the subject matter?

The process of interpreting data is often called as decoding process. In order to answer certain questions about classroom communication decoding may be done at the following level.

Quantitative Analysis of teacher behaviour is usually shown in the following terms:

(1) Interaction categories

(2) Areas of Interaction

(3) Behaviour ratios

(4) Interaction variables

In the present research behaviour ratios only were worked out which rendered the analysis into quite distinct and easy to understand units. This method required a ratio based on the matrices for the total groups, for the male sub group and the female sub group of student-teachers as formed for the purposes of this study. The twelve behaviour ratios which have been used in this study are explained in brief in the following paragraphs.

Teacher Talk (TT) - This was obtained as the ratio of the frequencies in column 1,2,3,4,5,6,7 to total number of frequencies in the master matrix and multiplied by 100.
(I) Teacher talk = \[ \frac{\text{sum of frequencies in column 1+2+3+4+5+6+7}}{\text{Total frequencies}} \times 100 \]

(II) Pupil talk (PT):- This was obtained as the ratio of frequencies in columns 8&9 divided by total frequencies in the master matrices and multiplied by 100.

\[ \text{Pupil Talk (PT)} = \frac{\text{Sum of the frequencies in 8&9 columns}}{\text{Total frequencies}} \times 100 \]

(III) Silence (Sc):- This was obtained as the ratio of frequencies in column 10 divided by total frequencies in the master matrices and multiplied by 100.

\[ \text{Silence (Sc)} = \frac{\text{Frequencies of columns 10}}{\text{Total frequencies}} \times 100 \]

(V) Teacher Response Ratio (TRR) – This was obtained as the ratio of frequencies in columns 1, 2,3,6,7 in the master matrices and multiplied by 100.

\[ \text{Teacher Response Ratio} = \frac{\text{Frequencies of column 1,2,3,6,7}}{\text{Frequencies of column 1,2,3,6,7}} \times 100 \]

(VI) Teacher question Ratio (TQR) – This was obtained as the ratio of the frequencies in column 4 divided by sum of frequencies of columns 4&5 in the master matrices and multiplied by 100.

\[ \text{Teacher Question Ratio} = \frac{\text{Frequencies of column 4}}{\text{Frequency of column 4&5}} \times 100 \]

(VII) Pupil Initiation Ratio (PIR)– This was obtained as the ratio of the frequencies in the column 9divided by sum of frequencies of columns 8 &9 in the master matrices and multiplied by 100.
Pupil Initiation Ratio (PIR) = \[ \frac{\text{Frequencies of column 9}}{\text{Frequency of column 8 & 9}} \times 100 \]

(VIII) Instantaneous Teacher Question Ratio (ITQR):- This was obtained as the ratio of the frequencies in column -rows (8-4) and column-rows (9-4) divided by sum of frequencies of (8-4) (8-5) (9-4) (9-5) in the master matrices and multiplied by 100.

Instantaneous Teacher Question Ratio

\[ (\text{ITQR}) = \frac{\text{Sum of the Frequencies of column (8-4) and (9-4)}}{\text{Sum of the Frequency of column (8-4)(9-4)(8-5)(9-5)}} \times 100 \]

(IX) Content Cross Ratio (CCR):-This was obtained as the ratio of the frequencies of rows 4 and columns 5 and column 4 & 5 divided by total frequencies of the master matrices and multiplied by 100.

Content Cross Ratio

\[ (\text{CCR}) = \frac{\text{Sum of the Frequencies of columns 4 & 5} + \text{Sum of the Frequency of rows 4 & 5}}{\text{Total Frequency}} \times 100 \]

(X) Steady State Ratio (SSR):-This was obtained as the ratio of sum of the frequencies of rows and columns (1-1) (2-2) (3-3) (4-4)........(9-9) (10-10) divided by total frequencies of the master matrices and multiplied by 100.

Steady State Ratio

\[ (\text{SSR}) = \frac{\text{Sum of the Frequencies of rows} - \text{column (1-1) ... (10-10)}}{\text{Total Frequency}} \times 100 \]

(XI) Pupil Steady State Ratio (PSSR):- This was obtained as the ratio of sum of the frequencies of column-rows (8-8) & (9-9) divided by sum of the frequencies of column–rows (8-8)(8-9) and (9-9) (9-8) of the master matrices and multiplied by 100.
Pupil Steady State Ratio

\[
(PSSR) = \frac{\text{Sum of frequencies } (8 - 8) (9 - 9)}{\text{Sum of the frequencies } (8 - 8) (9 - 9) (9 - 8) (9 - 9)} \times 100
\]

(XII) Indirectness (Id): This was obtained as the ratio of frequencies of columns 1, 2, 3 divided by sum of frequencies of columns 6, 7 in the master matrices.

\[
\text{Indirectness } (id) = \frac{\text{sum of frequencies of column 1,2,3}}{\text{sum of frequencies of column 6,7}}
\]

3.3.2 Teaching Efficacy

Another tool employed in the research was a test of self efficacy designed by the researcher himself. The concept of self efficacy as developed by Bandura (1977; 1986) was the basis for the construction of test items. According to Bandura self efficacy refers to a person’s self perceived capacity to perform a task or carry out a plan of action to deal with a situation. Self efficacious people believe that they have the ability to succeed, while those lacking in self efficacy do not share this same belief. Teaching efficacy refers to teacher’s beliefs about their capacity to affect students’ performance (Ashton, 1984, Demo& Gibson, 1985 Greenwood Et.al. 1990). Efficacious teachers believe that (1) good teachers can affect students regardless (or in spite of) the circumstances of their home environment, and (2) by trying hard, they personally, can reach even the most difficult students.(Ashton and Webb,1986). The first factor is sometimes referred to as general teaching efficacy and the second as the personal teaching efficacy. It has been often posed as to why is it
necessary for a competent teacher to have teaching efficacy? As Ashton (1984) has found, teachers who have it think and do different things in the classroom than teachers who do not have it.

Through various studies it has come to light that teachers with teaching efficacy (1) find teaching meaningful and rewarding rather than frustrating and discouraging (2) expect students’ success rather than failure and tend to get it (3) look inward for student failure rather than blaming it on students (4) set goals and develop strategies for themselves and students rather than ignoring these important success seeking activities (5) feel good about themselves and their students constantly complaining (6) feel in control and are sure in functional ingredients rather than at a loss and (7) not only share their goals with students but involve students in setting them (Ashton, 1984). In addition, teachers with strong efficacy beliefs have been shown to elicit greater achievement from their students (process-product) than teachers without strong efficacy beliefs Ashton, Webb & Doda (1983) have also found that at the challenging Junior high school level, teachers with strong efficacy beliefs maintained high academic standards, had clear expectations, concentrated on academic instruction, maintained students on task behaviours and demonstrated “with-it-ness”, that quality of seeming to have “eyes in the back of their heads.”

Therefore, the competent teacher must be a self-believer, a person who believes that teachers in general and he or she in particular can make a difference in the lives of the students. Teachers with this belief have a greater likelihood of succeeding than teachers who believe otherwise.

**Scale for measuring self efficacy**
A brief description of the scale for measuring self efficacy as used in
the study is as follows:

The test for the self efficacy consists of 64 items reflecting low and
high self efficacy. Table 3.5 gives a detailed picture of the distribution of
high and low self efficacy statements employed in the scale.

**Table 3.5 Structure and numerals of the statements in terms of low
and high self efficacy behaviour**

<table>
<thead>
<tr>
<th>Nature of self efficacy</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low self efficacy</td>
<td>2, 4, 5, 8, 9, 10, 12, 14, 16, 17, 18, 20, 22, 23, 31, 32, 36, 37, 41, 42, 43, 45, 47, 48, 50, 52, 56, 57, 58, 60, 61, 62</td>
</tr>
<tr>
<td>High self efficacy</td>
<td>1, 3, 6, 7, 11, 13, 15, 19, 21, 24, 25, 26, 27, 28, 29, 30, 33, 34, 35, 38, 39, 40, 44, 46, 49, 51, 53, 54, 55, 59, 63, 64</td>
</tr>
</tbody>
</table>

It may be noted from table 3.5 that there are 32 statements showing
low self efficacy while the remaining 32 statements reflect high self
efficacy.

A copy of the scale of self efficacy is available in appendix VI of the
thesis. The validity of this scale was assessed through expert critiquing
while the reliability was estimated through product moment correlation
using test-retest method, (r). The value of (r) was obtained to be 0.7697 or
0.77 which shows a satisfactory level of reliability of the scale. The
validity of the scale was judged through experts on the basis of congruence
of items with the construct of self efficacy as explained here.
3.3.3 Locus of control

For the study of locus of control, the concept as developed by Rotter was relied upon. In view of Rotter, locus of control reflects the location or source of the causes a person perceives for his or her own behaviour and the outcomes or reinforcement that result (Rotter, 1966). These causes can be internal or traced to factor within such as one’s own ability or the efforts or the strategy one adopts in dealing with a situation, or the causes can be perceived as external, or coming from outside oneself such as fate, luck or influence of others. People with an internal locus of control believe that their reinforcements are contingent on their own behaviour, while those with an external locus of control believe that their reinforcements are contingent on forces outside of themselves (Rotter, 1966).

How do competent teachers fall on this attitudinal variable? In this connection Murray and Staebler (1974) found that teachers with an internal locus of control those who believed that people determined their own outcomes, obtained greater student progress in the classroom than teachers with an external locus of control, those who believed that fate or other factors outside from them determined their outcomes. It was also noted that internal teachers were less vulnerable to burn-out than external teachers. Rose and Medway (1981) also discovered that a more internal locus of control was associated with a lesser degree of perceived stress than a more external locus of control.

Therefore, on the basis of researches, it has been asserted that competent teachers believe that people are responsible for their own outcomes, a generalized belief that obviously contributes to the belief, described above, that they can make a difference in the lives of their students.
**Scale of measuring locus of control**

The scale for locus of control as designed in this study was developed finally with 47 statements reflecting internal and external locus of control. All these statements were appropriately situated in the context of classroom interactional settings and the areas related thereto.

The Table 3.6 gives the details in respect of the number of statements indicative of the extent of Internality and Externality of locus of control as defined by Rotter.

**Table 3.6 Structure of the statements in terms of Internality and Externality**

<table>
<thead>
<tr>
<th>Area of locus of control</th>
<th>Statement Number in the Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal locus of Control</td>
<td>2, 4, 14, 15, 16, 17, 18, 19, 21, 24, 25, 26, 27, 31, 32, 34, 37, 41, 43, 44, 45, 47</td>
</tr>
<tr>
<td>(Internality)</td>
<td></td>
</tr>
<tr>
<td>External locus of Control</td>
<td>1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 20, 22, 23, 28, 29, 30, 33, 35, 36, 38, 39, 40, 42, 46</td>
</tr>
<tr>
<td>(Externality)</td>
<td></td>
</tr>
</tbody>
</table>

It may be observed from Table 3.6 that in the scale specially designed for this study there are 22 statements belonging to the internal locus of control (Internality) while there are 25 statements showing external locus of control. This was subjected to logical analysis by experts and was finally cleared by them. A copy of the scale of locus of control is available in Appendix – V of the thesis. It may be mentioned that the structure of statements and their validity was closely reviewed through expert critiquing. Whereas its reliability was estimated through computing
contingency co-efficient arrived at via use of chi-square through forming cross breaks.

In order to form the cross break in this regard scores of locus of control on the first testing and second testing were analyzed in terms of three groups High (120-Above), Medium (110-119), and low (below 110). The cross break was so formed for 50 students on the occasion of first testing. The value of contingency co-efficient (C) was obtained as 0.5340 or 0.53 which appears to be a satisfactory indicator of the reliability of the scale.

3.4 Data Analysis and its Design:

The data obtained from the various tools as described in the previous section were analyzed using a Non-Parametric test in addition to graphical representations and numerical analysis. For judging the interaction styles of B.Ed. trainees the variables used were Teacher Talk (T.T.), Pupil Talk (P.T.), Silence or Confusion (S.C), Teacher Question Ration (TQR), Pupil Initiation Ratio (PIR), Teacher Immediate Response Ratio (ITRR), Instantaneous Teacher Question Ratio (ITQR), Content Cross Ratio (CCR), Steady State Ratio (SSR), Pupil Steady State Ratio (PSSR) and Indirectness calculated as id ratio. The procedure for their calculation has already been explained in the relevant section.

All of these 12 variables were called interaction variables and were obtained from the master matrices constructed for the total group and the subgroups of male and female B.Ed. student-teachers. The copies of master matrices in this regard are presented in Appendix - I.
At the second stage of analysis the self-efficacy scores and their range was worked out. On the basis of this range of self-efficacy scores three groups of students were formed as follows.

The self-efficacy scores in between 153-166 were the basis for forming low self-efficacy group, 167-180 for medium self-efficacy group and 181-194 as high self-efficacy group. Subsequently these three groups were analyzed on the basis of their id ratio. The cross breaks for the total group, male group and female group were formed in order to compute contingency co-efficient via chi-square for each group separately.

These cross breaks were the basis for testing the research hypothesis (1) which has been already mentioned in Chapter I.

For the locus of control an analysis almost on the same pattern was attempted. Thus, three groups of student-teachers on the basis of their scores of locus of control were formed in the following manner.

Students with scores of locus of control in between 85-102 were designated as low group, between scores 103-120 as medium group and between scores 121-138 as high group. Afterwards cross breaks for the three groups for the total group as a whole, for male groups and for female groups of student-teachers were formed with id ratio on the one arm of the Cross Break. The analysis was here again done through computing a contingency co-efficient via chi-square and hypothesis (2) of research was evaluated on the basis of the procedure as indicated earlier. For testing the research hypothesis (3) joint cross breaks for id ratio on the one hand and the self-efficacy scores and locus of control scores on the other were formed using a factorial design. These cross breaks were analyzed for the total group, for the male group and for the female group of the student-
teachers separately. The overall analysis attempted in this regard and the results so obtained have been described in the subsequent chapter.

3.5 A Brief description of the field work:

In conducting the field work for the present research a firm time schedule was prepared well in advance in consultation with the supervisor. The record of interaction was maintained using a video tape through the assistance of a technical person. The detailed schedule in this regard is given in table 3.7.

**Table 3.7 The schedule followed for data collection and the details thereof**

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Number of students observed and coded</th>
<th>Duration of observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>05-March-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>02</td>
<td>06-March-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>03</td>
<td>07-March-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>04</td>
<td>08-March-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>05</td>
<td>02-April-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>06</td>
<td>03-April-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>07</td>
<td>04-April-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>08</td>
<td>05-April-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>09</td>
<td>01-May-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>10</td>
<td>02-May-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>11</td>
<td>03-May-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td>12</td>
<td>06-May-2013</td>
<td>05</td>
<td>75 Minutes</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60 Student-Teachers</td>
<td></td>
</tr>
</tbody>
</table>
The self-efficacy test and the locus of control test as described earlier were administered to each group immediately after the classroom teaching of concerned B.Ed. students was over. This was followed by scoring of these tests and the preparation of individual 10x10 interaction matrix for each B.Ed. student and constructing subsequently the master matrices for the total group, for the male group and for the female group of B.Ed. student-teachers. These were formed on the basis of individual matrices. After the computation of id ratio of each group from the concerned master matrix and their self-efficacy and locus of control scores were tabulated and an analysis through cross break formation was attempted as described earlier.

3.6 Summing up

The present chapter has, thus, brought out in some detail the methodology employed for the research, the population and the sample identified and selected, the research tools used and the schedule of the field work decided in advance and followed in respect of data collection and data collation.

The findings of the study as available in conformity with the design of data collection and data analysis explained here are presented and discussed elaborately in the subsequent chapter.