CHAPTER III

METHODOLOGY
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In the previous chapter a review of the related literature was presented and in this chapter an attempt is made to discuss the methodology of the study, viz., operational definitions used, variables, hypotheses, sampling procedures, research tools used for the collection of data and procedures adopted for the analysis of the data.

The purpose of the present investigation was to study the teaching effectiveness of urban teachers (as rated by their students) in relation to their teaching aptitude.

Despite an enormous amount of available literature on the subject of teacher effectiveness, no universally acceptable formula can be given to define an "effective teacher".

According to Ryans (1950) "Teaching is effective to the extent that the teacher acts in ways that are favourable to the development of basic skills: understanding, work
habits, desirable attitude, value judgements and adequate personal adjustment of the pupils.

Barr (1952) explains teacher effectiveness as a relationship between teachers, pupils and other persons concerned with the educational undertaking, all effected by limiting and facilitating aspects of the immediate situations.

According to Remmers (1952) "..... effectiveness is a degree to which an agent produces effects". The question immediately arises: "What effects and on what"? Usually these categories of effects in terms of the object effected are (a) pupil, (b) school operation, (c) school community.

Jones (1956) in his investigation distinguished between "good" and "poor" teachers by making students list characteristics of the least-liked and best liked teachers, measuring characteristics of teachers under training and correlating these measures with estimates of their success in actual teaching, studying teachers judged good and poor to discover factors and qualities in successful teaching.

According to the study reported by Stern, Stein and Bloom (1956) effectiveness is rather a standard of performance
in a specific work situation that some individuals are said to manifest.

According to Combs (1961) a good teacher is a person who has learned to use himself as an effective instrument. He has defined the effective teacher as "..... a unique being who has learned to use his self-effectively and efficiently for carrying out his own and society's purposes".

As indicated by Gerald Cortis (1977) effective teaching is a matter of the teacher finding the right 'niche' i.e., the appropriate situation in which to operate. So if there is a mismatch between the personal factors and the situation effective and happy teaching relations are unlikely to prosper.

As per Dickson (1980) "Teaching effectiveness is a demonstrated repertoire of competencies involved with (1) teaching plans and materials, (2) class-room procedures, (3) inter-personal skills, (4) learner's reinforcement-involvement reflect in teacher behaviour".

Gupta and Kapoor have derived the term "Teacher Effectiveness" as a repertoire of efficacy exhibited by a teacher in:
1. Instructional strategies
2. Class-room management
3. Personal disposition, temperament and tendencies
4. Evaluation and feed-back
5. Inter-personal relations
6. Job involvement
7. Initiative and enthusiasm
8. Professional values
9. Innovativeness respectively in the everyday teaching-learning situation.

According to Biddle and Ellena (1964) "Teacher effectiveness is the ability of a teacher to produce agreed upon educational effects in a given situation or context".

Gage (1962) describes teacher effectiveness in terms of teachers effects on the realization of some value where value taken the form of some educational objectives, defined in terms of desired pupil behaviours, abilities or characteristics.

According to Ryans (1969) "Teacher effectiveness may be essentially a relationship between teachers, pupils and other persons concerned with the educational undertaking all affected by limiting aspects of the immediate situations".
As stated by Flanders and Simon (1969) "Teacher effectiveness is concerned with relationship between the characteristic of teachers, teaching act and their effects on the educational outcome of class-room teaching.

As indicated by Brophy (1976) effective teaching requires the ability to implement a very large number of diagnostic instructional, managerial and therapeutic skills, tailoring behaviour in specific contexts and situations to the specific needs of the moment.

As defined by Brophy (1976) teacher effectiveness boils down to effectiveness in producing student learning gains.

Teacher Effectiveness according to Kulsum and Khajapeer (1982) is understood in terms of the following dimensions:

1. Preparation and planning for teaching
2. Class-room management
3. Knowledge of the subject
4. Teacher characteristics
5. Inter-personal relations
Each of those dimensions have been operationally defined by these authors as given below:

**Preparation and Planning for Teaching:**

Ability of the teacher in preparing, planning and organising for teaching in accordance with the course objective by using different course material.

**Class-room Management:**

Ability of the teacher to successfully communicate, motivate the students and evaluate the teaching-learning process and also to maintain discipline in the class-room within the framework of a democratic set up.

**Knowledge of Subject Matter:**

Ability of the teacher in acquiring, retaining, interpreting and making use of the contents of the subject he/she is dealing within class-room situations.

**Teacher Characteristics:**

Personality make up and its behavioural manifestations that have their own level of acceptability or unacceptability in the teaching profession.
Inter-personal Relations:

Ability of the teacher to adopt himself/herself to maintain cordial relationship with his/her colleagues, pupils, their parents and other persons in the community with whom he/she is to interact as a part and parcel of his/her profession.

It is to be noted that a distinction should be made between the two terms namely, teacher effectiveness and teaching effectiveness. Generally teacher effectiveness, as many researches have shown include psychological operative and personality dimensions and hence is a more comprehensive term giving a description of teacher as an individual (Gupta, 1976; Chhaya, 1974). The term teaching effectiveness would be more specific and limited in its conceptualisation. As Hughes and Hughes say "no teaching is done when no learning ensures or occurs". Hence the effectiveness in teaching is generally to be examined in terms of the effect it has on the learning behaviour of the students (Elemoni and Hexer, 1973; Blount and Stallings, 1978). Keeping this in view, teaching effectiveness in this study is defined as follows:
Operational Definition of Teaching Effectiveness:

The teaching effectiveness is defined as a measure of impact of teaching of a teacher on his/her students as perceived by the target groups of students themselves. It includes such aspects of impacts as the extent of homophily between the teacher and the taught, the extent of the transference of the content within the limits of the comprehensive level of the students, the pedagogical dimensions utilised in the process of instruction and the extent of the evaluation and feed-back to the students.

In the present investigation, this has been examined in terms of the following four dimensions of teaching effectiveness:

1. Human Relations Dimension
2. Content Dimension
3. Instructional Dimension, and
4. Evaluative Dimension.

Human Relations Dimension (HRD):

This dimension includes such teaching behaviour patterns with an impact on the students as empathy, understanding, concern, involvement, propriety and dignity in
behaviour, enthusiasm and a sense of worry and anxiety about the academic progress and personality development of the students.

**Content Dimensions (CD):**

The content dimension of teaching effectiveness includes such aspects of teaching behaviour of the teacher, that has an impact on the students, as the mastery over the content a good study habit, acquisition of latest knowledge, and to keep oneself abreast with the contemporary developments and ability of clear thinking and tackling any question related to the content under discussion. The personal studious habits of the teacher one perceived by the students, inspires them to emulate and as such the impact is forceful on the students.

**Instructional Dimension (ID):**

This dimension includes such aspects of teaching behaviour, that has an impact on the students as clarity in communication, richness in language, vocabulary and grammar, pedagogical approaches towards instructions, ability to question deeply and probingly, capacity to analyze a concept logically, conceptually and effectively
and have an academic approach towards instruction including proper preparedness, effective execution and comprehensive conclusion of a lesson.

**Evaluative Dimension (ED):**

This dimension of teaching effectiveness include such aspects of teaching behaviours as perceived by the students as the proper utilisation of knowledge of results for the purposes of feedback and academic improvement, objectivity and fairness in the process of evaluation, ability to test periodically, systematic approach to the giving of assignments, correction of assignments and informing test results as also the personal concern in the academic progress of the students and a check on the parental involvement on the progress of their wards.

The above dimensions provide an index of teaching effectiveness of teachers as perceived and rated by their own students.

Having examined the concept of the teaching effectiveness, it is now appropriate to examine the other important concept namely teaching aptitude.
**Aptitude:**

Generally aptitude is a psychological construct which provides an individual’s disposition and readiness in the direction of taking up any activity. It is a psychological state of mind which predisposes an individual towards an active involvement in a given activity. It has a predictive value about the possible future performance of an individual in a given direction.

**Operational Definition of Teaching Aptitude:**

In the present study, teaching aptitude is defined as that readiness of mind of an individual teacher because of which he/she gets favourably disposed towards teaching as an activity in all its various aspects.

A teacher with a high level of aptitude would take a keen interest in teaching and looks forward for a deep and personal involvement in teaching and welfare of his/her students.

**Urban Teachers:**

In the present study, it is confined to the study of the teaching effectiveness of teachers in relation to
a few factors of teachers, who were teaching in schools of Bangalore city only. Thus this study is limited to teaching effectiveness of urban teachers only.

**Variables of the Study:**

In the present study teaching effectiveness of teachers was the dependent variable as it was the focus of the study. This has four dimensions namely:

1. Human Relations Dimension
2. Content Dimension
3. Instructional Dimension
4. Evaluative Dimension.

Each of these dimensions would provide an index of teaching effectiveness in teaching of an individual.

The present investigation is limited to the effectiveness of teachers as rated by ninth standard students who were taught by their respective teachers who formed the sample for the present study.

In the present study the independent variables were the following:
Teaching Aptitude:

The teaching aptitude formed an independent variable in the present investigation. Among the causative factors that may influence the effectiveness of teaching among teachers, apart from such factors as a competency knowledge, interest and so on, the teaching aptitude is of primary importance. If a teacher possesses substantial amount of teaching aptitude it would certainly cause him/her equip himself/herself with competency, skill, interest and involvement, thus render him/her effective in his/her teaching. Mere competency may fail to deliver the goods because without a proper aptitude other abilities would not be of any avail from the point of view of effectiveness.

It also should be noted that aptitude is a psychological state of mind of readiness to undertake teaching activity whereas the effectiveness is the results of his/her teaching activity in terms of its impact on the students. Thus though these two factors are inter-related conceptually they are separate.

The effect of this factor on the teaching effectiveness was studied. The teachers were categorised into three groups based on their teaching aptitude scores. The
teachers who scored less than 62 formed category of low aptitudes. The teachers whose scores were between 63-65 formed the category of moderate aptitude and the teachers who scored more than 66 formed the category of high aptitude.

**Sex of the Teacher:**

The sample includes both male and female teachers.

**Age of the Teacher:**

Age of the teacher which was the chronological age of the teachers was one of the independent variables of the study, as the teachers were grouped into three categories based on their age namely, the teachers who were less than 31 years old were grouped into one category, and teachers between the age group of 32-43 years old were grouped into second category, whereas teachers who were more than 44 years old were grouped into third category.

This was arrived at by computing the $Q_1$ and $Q_3$ (see Appendix 'F').

**Experience in Teaching:**

The teachers were categorised into three groups based on their length of teaching experience.
Teachers who had an experience less than 7 years of teaching formed one group, teachers between 8-17 years of experience formed a second group and teachers with 17 years and above of teaching experience formed the third group.

This was arrived at by computing $Q_1$ and $Q_3$ values of the distribution of teaching experience of teachers (see Appendix 'G').

**Types of School in which Teachers are Working:**

The sample included teachers from private, government and corporation high schools.

**Different Subject Teachers:**

The sample included both teachers who were teaching arts subjects and science subjects.

**Marital Status of Teachers:**

The sample included both married and unmarried Teachers.
Qualification of Teachers:

The sample included both trained graduate teachers and trained post-graduate teachers.

Statement of Hypotheses:

A few hypotheses were stated in order to examine the effects of independent variables studied on the teaching effectiveness of teachers:

Major Hypotheses:

1. There is no significant relationship between the teaching aptitude scores and the scores in the four dimensions of teaching effectiveness.

2. There is no significant difference in the teaching effectiveness of teachers with different levels of teaching aptitude.

3. There is no significant difference in the teaching effectiveness of male and female teachers.

4. There is no significant difference in the teaching effectiveness of teachers belonging to different age groups.
5. There is no significant difference in the teaching effectiveness of teachers with different lengths of teaching experience.

6. There is no significant difference in the teaching effectiveness of teachers working in Government, Private and Corporation high schools.

7. There is no significant difference in the teaching effectiveness of trained graduate teachers and trained post-graduate teachers.

8. There is no significant difference in the teaching effectiveness of teachers teaching Science and Arts subjects.

9. There is no significant difference in the teaching effectiveness of married and unmarried teachers.

These hypotheses were tested by formulating four minor hypotheses in respect of the four dimensions of teaching effectiveness of teachers.
Sampling:

The population for the present study was all those teachers who were teaching at the nineth standard level of urban high schools in Bangalore. The sampling was done in order to get school representation, teacher representation as also at the student level. Nine schools were drawn randomly from among the government, corporation and private schools of Bangalore city.

The teachers were drawn in such a way that the teachers teaching different subjects like social studies, science, mathematics and languages could be included in the sample. Thus, 60 teachers were drawn for the sample. In addition to the above, in order to get the ratings of the teaching effectiveness of teachers, students studying in ninth standard taught by these teachers also were involved in the study. Six students were randomly selected to rate two teachers. Each student rated two teachers, there are 360 ratings covering 60 teachers.

From a school 12 to 30 students were involved to rate four to ten of their teachers altogether. This was done on a random basis. Thus in the present study a total number of 60 teachers formed the subject for the
investigation who were rated by the total number of 180 students.

Therefore the technique of sampling adopted was stratified random technique in the case of teachers and random technique in the case of students. (See Appendix 'H' for the list of the schools).

Table 1 : Table showing the distribution of teachers and students included in the sample for the present study

<table>
<thead>
<tr>
<th></th>
<th>Government</th>
<th>Corporation</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teachers</td>
<td>Students</td>
<td>Teachers</td>
</tr>
<tr>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Total number of Teachers = 60</td>
<td>Total number of students = 180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Note: M = Male; F = Female)

Tools of Research:

The following tools were used for the collection of data:

1. Teaching Effectiveness Scale
2. Teaching Aptitude Scale.
The teaching effectiveness scale was developed by Dr B G Sudha and B S Sathyanarayana (1986) at the Department of Education, Bangalore University, which is based on students' rating technique. This tool has a total number of 93 items. It has four dimensions namely Human Relations Dimension, Content Dimension, Instructional Dimension and Evaluative Dimension.

Human Relations Dimension has 20 items, Content Dimension has 22 items, Instructional Dimension has 29 items and Evaluative Dimension has 22 items.

Each item has four alternative responses, namely NT = Not True; IT = I personally feel it is True; MT = Many of us feel it is True; and AT = All of us feel it is True.

In the case of positive statements of the scale weightages of 0, 1, 2, 3 were given for NT, IT, MT and AT respectively. For the negative items this was reversed giving 3, 2, 1, 0 for NT, IT, MT and AT respectively.
Thus the range of scores on this scale for each area varied from 0 to 60 for human relation dimension and 0 to 66 for content dimension and evaluative dimension and 0 to 87 for instructional dimension.

Higher the score, higher would be the teaching effectiveness of teachers.

This tool was given to 180 students - 6 students would rate 2 of their teachers by responding to these items. Therefore the teaching effectiveness in this research is measured by the students rating technique and a score a teacher gets, averaged from the 6 ratings would be the teaching effectiveness score of the teacher in each component. (see Appendix 'A' for the English version of teaching effectiveness scale and Appendix 'B' for the scoring key of the scale).

**Validity:**

The items were screened and finalised by experts and therefore the content validity of the tool is assumed.

However an attempt was made to establish content validity by computing the coefficients of correlation among the dimensions of teaching effectiveness scale.
The following table presents the coefficient of inter-correlation among these dimensions.

Table 2: Correlation Matrix of coefficient of correlation among the four dimensions of teaching effectiveness scale

<table>
<thead>
<tr>
<th>Teaching effectiveness scale</th>
<th>Human Relation Dimension</th>
<th>Content Dimension</th>
<th>Instructional Dimension</th>
<th>Evaluative Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Relation Dimension</td>
<td>0.75**</td>
<td>0.79**</td>
<td>0.72**</td>
<td></td>
</tr>
<tr>
<td>Content Dimension</td>
<td></td>
<td>0.82**</td>
<td>0.80**</td>
<td></td>
</tr>
<tr>
<td>Instructional dimension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluative dimension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(** probability less than 0.01).

From the above table, it could be inferred that the obtained coefficient of correlation are positive and high (0.72 to 0.82) the instrument has demonstrated a high degree of validity for internal consistency.

Reliability of the Teaching Effectiveness Scale:

In order to establish the inter-rater reliability of the scale, an attempt was made to compute the coefficients
of correlation among six raters in respect of each teacher with respect to the four dimensions of the teaching effectiveness tool. The following table presents the obtained inter-correlation.

Table 3: Correlation Matrix of inter-rater coefficient of correlation in respect of Human Relation Dimension rating of students

<table>
<thead>
<tr>
<th>Rating of students</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.80**</td>
<td>0.35**</td>
<td>0.71**</td>
<td>0.44**</td>
<td>0.25*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.59*</td>
<td>0.67**</td>
<td>0.38**</td>
<td>0.48**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>0.45**</td>
<td>0.28**</td>
<td>0.40**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>0.33**</td>
<td>0.31*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>0.38**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(* Probability less than 0.05; ** probability less than 0.01)
Table 4: Correlation Matrix of inter-rater coefficient of correlation in respect of content dimension

<table>
<thead>
<tr>
<th>Rating of Students</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.30*</td>
<td>0.29*</td>
<td>0.32*</td>
<td>0.38**</td>
<td>0.25*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>0.48**</td>
<td>0.45**</td>
<td>0.25*</td>
<td>0.26*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>0.29*</td>
<td>0.38**</td>
<td>0.54**</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>0.40**</td>
<td>0.27*</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.50**</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(* Probability less than 0.05;  
** Probability less than 0.01).

Table 5: Correlation Matrix of inter-rater coefficient of correlation in respect of Instructional Dimension

<table>
<thead>
<tr>
<th>Rating of Students</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.95**</td>
<td>0.33**</td>
<td>0.35***</td>
<td>0.30*</td>
<td>0.45**</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>0.56**</td>
<td>0.42**</td>
<td>0.30*</td>
<td>0.27*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>0.50**</td>
<td>0.48**</td>
<td>0.59**</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>0.97**</td>
<td>0.26*</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.43**</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(* Probability less than 0.05;  
** Probability less than 0.01)
Table 6: Correlation Matrix of inter-rater coefficient of correlation in respect of Evaluative Dimension

<table>
<thead>
<tr>
<th>Rating of Students</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.62**</td>
<td>0.60**</td>
<td>0.37**</td>
<td>0.30*</td>
<td>0.42**</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>0.72**</td>
<td>0.54**</td>
<td>0.47**</td>
<td>0.31*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>0.41**</td>
<td>0.62**</td>
<td>0.41**</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>0.34**</td>
<td>0.35**</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.47**</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(* Probability less than 0.05; ** Probability less than 0.01)

From the above it could be seen that the obtained correlations range from 0.25 to 0.95, most of the obtained correlations were moderate, positive but significant.

Therefore the instrument has appreciable degree of inter-rater reliability.

The ratings of all the six raters were averaged in respect of each teacher in each of the dimensions of teaching effectiveness which was an index of the effectiveness of the teacher for the purposes of analysis.
Teaching Aptitude Scale:

This tool was developed by Dr B G Sudha and B S Sathyanarayana (1982) at the Department of Education, Bangalore University, based on paired choice technique. This tool has a total number of 36 items. Each item has two alternatives. The content of each distractor reflects a particular level of aptitude of teaching. The distractors are arranged on a random basis. The distractors are to be scored with 1 and 2 depending on the degree of aptitude indicated by the distractors. Thus the range of scores for the tool would be from 36 to 72. The tool is based upon the assumption of unidimensionality and inclusiveness in the sense used by Guttman though no scalogram analysis was done to the response.

The tool constructors indicate that the instrument was originally based on the analysis and 40 items, each one being a tetrad having four statements indicating the different degree of aptitude. Initially the respondents (200 urban and 200 rural teachers) were asked to order or rank the statement indicating their aptitude towards teaching. The analysis of t-test was done to determine the discriminative nature of each statement between the high and low aptitude groups.
Subsequently the terms in the tool were restructured depending upon the positive and negative t-values clearly demarcating the level of aptitude of teachers. Thus the present scale in its final form was reduced to 36 items each having two alternatives indicating the degree of aptitude. The response mode was also simplified by asking the respondents to underline one of the two statement, expressing their extent of aptitude.

Validity:

The items were screened and finalised by experts and therefore the content validity of the tools is assumed. As the items for the final scale was based on the t-values and hence the items were discriminative, therefore, the tool has got validity.

The researcher established the reliability of the tool by test-retest method by administering the same to a sample of 16 teachers with a gap of four weeks. The obtained coefficient of reliability (test-retest) was found to be 0.85. Therefore, the tool was considered to be valid and reliable (See Appendix 'C' for the English version of teaching aptitude scale, and Appendix 'D' for the scoring key of the scale).
This scale is a self-rating scale in which the teachers have to rate themselves about their aptitude.

In order to get the three criterion groups of high, moderate and low in respect of teaching aptitude, the scores obtained by the teachers were projected into the frequency distribution and $Q_1$ and $Q_3$ values were computed. The computed values were $Q_1 = 62$ and $Q_3 = 66$ for low and high aptitude group. The scores from 63 to 65 were considered as moderate group (see Appendix 'E' for the computational details).

**Reliability of the aptitude Scale:**

Rita George (1981) establishes the test-retest reliability of the instrument by administering it (with 40 items) to a group of 10 teachers with a time interval of four weeks.

Santakumar (1982) establishes the test-retest reliability of the instrument by administering it (with 40 items) to a group of 25 teachers with a time interval of six weeks.
The present researcher also established the test-retest reliability for the instrument by administering it (with 36 items) to a group of 16 teachers with a time interval of 4 weeks. The following table presents the obtained coefficient of reliability for each of the components in all the three instances.

Table 7: Coefficient of reliability for the aptitude scale

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Different researchers</th>
<th>Coefficient of reliability of the Aptitude scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Coefficient of reliability by Rita George (1981) (N = 10)</td>
<td>0.90</td>
</tr>
<tr>
<td>2.</td>
<td>Coefficient of reliability by Shantakumar (1982) (N = 25)</td>
<td>0.40</td>
</tr>
<tr>
<td>3.</td>
<td>Coefficient of reliability by the present researcher (N = 16)</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Therefore, the scale was deemed to be valid and reliable.
Administration of Tools:

The investigator personally went to the urban schools of Bangalore district and distributed the instrument and collected them from 60 teachers and 180 students each of whom rated two teachers, thus totalling to 360 ratings. Six students have rated for each teacher and each student has rated two teachers.

The aptitude scale was distributed among the teachers, who rated themselves which were collected back by the teachers after sometime. The responses of the students and teachers were scored for the two scales. The scored responses were subjected to statistical analysis.

Statistical Analysis:

The collected data were tabulated for the purpose of analysis. The separate variance model of t-test was used for the testing of the hypothesis for the significance of mean differences in the teaching effectiveness scores of various groups of teachers compared. The formula for the separate variance model is:
\[ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}} \]

Where \( \bar{X}_1 \) and \( \bar{X}_2 \) are the means of the two groups. 
\( \sigma_1^2 \) and \( \sigma_2^2 \) are the squares of the standard deviations of the two groups and \( N_1 \) and \( N_2 \) are the number of teachers in the two groups respectively.

In the next chapter, Analysis and Interpretation of the data along with the Discussion of Results would be presented.