CHAPTER-3

METHODOLOGY
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3.0 INTRODUCTION

The purpose of this chapter is to provide a clear picture about the design of the study. A design of study helps the researcher to conduct his/her research in a scientific manner. A scientific research depends on the sampling technique, availability of as per the need of research and research design. It has been necessary to employ the recent methods for measurement of the variable and control of variables.

This chapter deals with population, sample, test and its administration, scoring and selection and its analysis. In behavioural sciences procedure adopted under the scientific norms to study a problem is called methodology. Methodology does not constitute any single method only; it submerges in itself all the procedures involved while exploring the multiple aspects of a problem Lundberg (1962) said that the scientific methodology consists of systematic observation, classification and interpretation of data.

3.1 POPULATION

The whole group of units from which a sample is to be selected is technically termed as population. Population for this study consists of 1609 secondary school teachers of Durg district of Chhattisgarh.

Sampling is simply the process of learning about population on the basis of a sample drawn from it. Under this process a small group
of the universe is taken as the representative of the whole mass and the results are drawn. The essence of sampling is the selection of a part (sample) from the whole (population) in order to make inference about the whole.

### 3.2 SAMPLE

There are two types of studies of population related to the research:

1. **Parametric Method**
2. **Non-Parametric Method**

In social sciences from the practical and theoretical points of view, study by the non-parametric method is simple, easy, economic and valid. Sample from the basis of the non-parametric method. According to Kerlinger (1964) “Sampling is taking any portion of a population or universe as representative of that population, or universe”. Good and Hatt (1952) point out that “Sample as the name applies, “is a smaller representation of a large whole”. According to Young (1963), “a statistical sample is a miniature picture or cross-section of the entire group or aggregate from which the sample is taken”.

Sampling method is based on two statistical laws:

1. Law of Regularity
2. Law of Inertia
Aims of Sampling:

1. To study the selected units instead of the whole universe
2. To get results in a short period of time.
3. To get essential information at low cost.
4. To minimize sampling variances.
5. To get real and error free conclusion.

**Sampling Methods :-**

(i) Lottery Method

1. Probability Sample
   (ii) Rotating Drum Method
   (iii) Tippets Random number.

2. Semi Probability Sample (Limited Random Sampling)
   (i) Systematic Sampling
   (ii) Stratified Sampling
   (iii) Cluster Sampling
   (iv) Double Sampling
   (v) Multiple Sampling
   (vi) Sequential Sampling

3. Non-probability Sampling
   (i) Chunk Method
   (ii) Quota Method
(iii) Incidental or Accidental Sampling

(iv) Convenience Sampling

(v) Purposive Sampling

(vi) Judgement Sampling

(vii) Expert Sampling

(viii) Self Selected Sampling

The investigator has adopted the stratified sampling method.

**Stratified Sampling** :

When the nature of population is heterogeneous, the subdivision of population done into different strata; is rational and appropriate, because in stratified sampling, units, of sample are taken in proportion to every strata, so this method is called proportional stratified sampling also. Advantages of this method are :

1. More representation of population.

2. Standard error of sample is less.

3. More reliable and scientific.

4. Deep study of population is possible.

**Sample Design** :

The present study was conducted on secondary school teachers. Stratified random sampling technique was employed to select the sample for the present study. The various secondary schools of Durg district were divided into two strata; rural and urban. From these rural and urban secondary school, total 240 teachers from each stratum was selected. Out of each sample of 240 secondary school teachers 120
were male teachers while the remaining 120 were female secondary teachers. Again, out of these male and female secondary school teachers each gender group was sampled out with 60 science and 60 non-science teachers and from each sub stratum of 60, 20 were high experience teachers, 20 were average experience teachers, and 20 were low experience teachers. A scheme of sample for the present study has been provided in table 3.01.

### Table 3.01: Sample of the Study

<table>
<thead>
<tr>
<th>Locality</th>
<th>Rural 240</th>
<th>Urban 240</th>
<th>Total 480</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td>Male 120</td>
<td>Male 120</td>
<td>Male 120</td>
</tr>
<tr>
<td></td>
<td>Female 120</td>
<td>Female 120</td>
<td>Female 120</td>
</tr>
<tr>
<td><strong>Teaching Subject</strong></td>
<td>Science 60</td>
<td>Non-Science 60</td>
<td>Science 60</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>High Exp.</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Ave. Exp.</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Low Exp.</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>240</td>
<td>240</td>
<td>480</td>
</tr>
</tbody>
</table>

### 3.3 TOOLS

There are two variables which are to be tested on secondary school teachers. The investigator has selected two tools i.e. to measure change proneness of secondary school teachers, change proneness Inventory Constructed and Validated by Mukhopadhyay (1982) and to measure teacher effectiveness of secondary school teachers, teacher effectiveness scale dev eloped and standardized by Saxena & Shrivastava (2012).
1. **Change Proneness Inventory:**

   The inventory consists of 36 items related to various characteristics of a change prone teachers like open mindedness, eager to know, ready to make extra efforts, reviews his/her ideas periodically, communicate ideas to others and have experimental attitude. In all the inventory contains 33 items for teacher and principal both, and 12 items for only principals.

   The inventory was administered on 60 secondary school teachers. The split-half reliability found by using spearman Brown Prophecy formula was 0.82 which is significant at 0.01 level. Chi-square test carried out on a 2 (Innovative/non-innovative schools) x 3 (Good/moderate/poor scores on change proneness). Contingency table was found significant at .05 level, thus indicating that change proneness of teachers successfully differentiates innovative schools from the non-innovative schools.

2. **Teacher Effectiveness Scale:**

   To measure the teacher effectiveness of secondary school teachers, a teacher effectiveness scale TES was developed and standardized by the investigator.

(ii) **Construction of Preliminary Draft:**

   To develop the scale, at first a thorough literature survey was carried out to look into the scales that are available for the measurement of teacher effectiveness. After survey of literature on teacher effectiveness it was decided to prepare a new scale in terms of characteristics of a teacher his personality, attitude, process (teacher pupil interaction) and production variables (outcomes of teaching learning process, namely pupil achievement). Finally after exhaustive
review and consultation, five areas were finalized i.e. (1) Preparation and planning for the teaching (2) Classroom management, discipline, motivation interaction and evaluation (3) Knowledge of subject matter, its delivery and presentation including Black Board Summary (4) Personality Characteristics of teacher and (5) Interpersonal relations of teachers with others. These five areas cover a aspects of teacher’s functions and hence have the merit of adequate conceptual framework and content validity. A brief description of each of these areas is given below:

**Preparation and Planning for Teaching** : This area includes statements pertaining to the ability of the teacher in preparing, planning and organizing for teaching in accordance with the course objectives by using different source material.

**Classroom Management** : This area includes statements pertaining to the ability of the teacher to successfully communicate, motivate the students and evaluate the teaching learning process and also to maintain discipline in the classroom within the framework of democratic set-up.

**Knowledge of Subject-Matter** : Its delivery and presentation including Black Board Summary. This area includes statement on the ability of the teacher in acquiring, retaining and making use of the contents of the subject he/she is dealing within the classroom situations. Delivery of course content and its presentation including Black Board Summary constitutes essential aspect of the teaching learning process.

**Teacher Characteristics** : This area includes statements pertaining to the personality make-up and its behavioural manifestations that have their own level of acceptability or unacceptability in the teaching profession. Ability to arouse, ‘A perceptive Mass’ and seeking active
participation of pupils constitute essential demand characteristics of effective teacher.

**Inter Personal Relations** : The ability of the teacher to adopt himself/ herself to maintain cordial relations with his/her colleagues, pupils, their parents and other persons in the community with whom he/she is to interact as part and parcel of his/her profession form the basis to have statements pertaining to this area.

(iii) **The Item Pool** :

Initially a list of 120 statements distributed over the above five areas were pooled from various sources. Then, draft items were given to 10 selected judges who were well-versed in teacher education and scale construction, with a request to review the statements and evaluate their content accuracy and coverage, their repetition, additional quality with suggestion for additions, deletions and modification of items. Based on 100% unanimity of the judges 117 statements were included in the try-out form of the scale. Their distribution under each of the area was as follows:

1. Preparation and planning for teaching
2. Classroom management
3. Knowledge of subject matter
4. Teacher characteristics
5. Inter-personal relations

Finally, these 117 statements were provided with five responses categories, namely Strongly Agree, Agree Uncertain, Disagree & strongly disagree.
(iv) **The try-out:**

A questionnaire comprising of 117 items, each with five point rating scale was thus prepared after consulting with experts. The 100 items of the questionnaire, obtained from experts were arranged in jumbled way. The questionnaire thus prepared was distributed to 100 secondary school teachers of various secondary schools of Durg District, Chhattisgarh for item analysis.

For item analysis scoring of the questionnaire was done. The five alternatives strongly Agree, Agree, Uncertain, Disagree & Strongly Disagree, have been assigned 5, 4, 3, 2 & 1 weightage respectively. The Researcher has counted and put the totals of the tick marks on each page in the five respective boxes provided for the purpose. At the end, the grand total of the marks were multiplied by the above weightage i.e. respective obtained frequencies of the five total response categories x respective weightage. This procedure yielded in raw scores. The raw scores of teachers obtained were arranged in increasing order out of which 1st quartile & 3rd quartile scores were taken, thus forming two groups one lower group & other higher group. The mean and standard deviation for each item of the teachers of lower group (25% below the 1st quartile) and higher group (25% above the 3rd quartile). The mean and S.D. for each item of the teachers of lower and higher group were calculated. To find out the significant difference between the lower & higher group for each item ‘t’ test was applied. The items for which the ‘t’ values were found insignificant at the 0.05 level, were rejected. 58 Items were found significant at 0.05 level and those were retained in the final questionnaire.
(v) **Final Draft:**

The item analysis led to the rejection of few items. Out of 117 items 59 items were rejected and hence, the final scale of teacher effectiveness scale comprised of 58 items given in Appendix.

(vi) **Reliability:**

The test-retest method was used to find out the reliability of the scale. The TES was administered on 100 secondary school teachers twice with interval of 3 months. Thus two sets of scores were obtained from the same respondents and the scores were correlated. The coefficient of correlation between two sets of scores was found to be 0.82 indicating that the instrument is highly suitable to measure T.E. of secondary school teachers.

(vii) **Validity:**

To find out the validity of the developed scale the T.E.S. developed by Mutha was administered alongwith the developed T.E.S. on a sample of 50 secondary school teachers. The score obtained on both were correlated to get the coefficient of validity. Pearson Product Moment Correlation was used to find out the validity of the developed T.E.S. which was found to be 0.73. Besides these content validity was established by experts.

**Norms:**

Norms of the scale are available on a sample of 500 secondary school teachers. The developed T.E.S. was administered to 500 secondary school teachers of various secondary schools of Durg District. The mean of the scores was 247.70 & S.D. was 26.46. The
subjects were classified into 5 categories based on their scores. The range of different categories is given in table 3.02.

Table 3.02: Norms of the Scale (Category)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Category</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Low</td>
<td>194 &amp; below</td>
</tr>
<tr>
<td>2</td>
<td>Low</td>
<td>195-220</td>
</tr>
<tr>
<td>3</td>
<td>Average</td>
<td>221-274</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>275-301</td>
</tr>
<tr>
<td>5</td>
<td>Very High</td>
<td>302 &amp; above</td>
</tr>
</tbody>
</table>

3.4 Procedure

The collection of data for this study has been done with the following steps:

1. The researcher collected a list of the recognized high schools & higher secondary schools from District Education office Durg. From this list, the schools have been-selected by random sampling method after which the list of teachers with their personal data i.e. sex, experience and teaching subject have been collected from those selected schools, then after.

2. The change-proneness inventory and teacher effectiveness scale was applied on sample and scored and then.

3. The Master-sheet of data was prepared for teachers rural/urban area male/female science/non-science teaching subject and low, average and high teaching experience.
3.5 Statistics Used

The statistical analysis of data was processed for the analysis of results and verifications of hypothesis. The mean as measure of central tendency, standard deviation as measure of deviation and ANOVA to study the statistically significant difference among groups and ‘t’-test / CR for studying statistically significant difference between two groups, were employed.

1) To examine the relationship between change proneness and teacher effectiveness product moment correlation was calculated.

2) To study the contribution of change proneness in predicting teacher effectiveness, regression analysis technique was employed.

3) To investigate the effect of locality, sex, teaching subject and experience on change proneness and teacher effectiveness, 4-way (2x2x2x3) ANOVA was computed.

4) To see the significant of difference between two means t-test was employed.

5) To see the significant of difference between two r’s t-test was employed.