CHAPTER III

PROCEDURE & TECHNIQUE
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PROCEDURE AND TECHNIQUE

3.1 General Method:

A procedure is to a research-worker as tools are to a carpenter. Taking a specific, pin-pointed problem and trying to find a solution, in scientific manner, to it is a procedure of research.

Technique is to research, what method is to teaching or in the sense what logic is to thinking.

Techniques and tools of research, for the purpose of data collection, are as important to a researcher as tools to a carpenter to do his job. Even a highly trained and skilled carpenter can do nothing without tools. Similarly, an expert and ingenious researcher is helpless to investigate his research programme without the use of research tools and techniques. Mere possession of research tools does not help the researcher to achieve the desired goal but the judicious selection and appropriate use of each tool can crown his sincere efforts.

Every researcher tries his best to establish genuineness, authenticity and trust-worthiness of the
data collected. To achieve all this, factual material or data, unknown or untrapped so far, is essential in every study which can be obtained from various sources, direct or indirect. It is necessary to adopt a systematic procedure to collect essential data. Relevant data, sufficiently adequate in quantity and quality, should be collected which should be sufficient, reliable and valid. Various devices can be used for the purpose of collecting new and unknown data for the study of any problem. For each research problem, the researchers use certain devices to gather new facts or to explore new fields. The devices that the researchers use for the purpose of data collection are called tools of research. Different tools are suitably employed in different situations. The researcher may use one or more tools in his study. He must familiarise himself with the nature, merits and limitations of all these tools of research. He should also know how to construct and use these tools effectively for his purpose. The major tools of research are many and it is not the purpose of the researcher to describe all of them here. He thinks it desirable to mention that the tools employed in this research study have been explained briefly on the proceeding pages in this chapter.

3.2 Sample

In every research project, it is not only difficult but impossible also to include the whole population.
Generally, what the research workers do is to select a part of the whole population to draw conclusions and make generalisations about the whole based on the study of the representative part of the whole population. This process of using a representative part as a basis for the study of the whole is known as the representative sample of the whole population. Every research study follows a sampling process because of the fact that it is not within the limits and capacities of the research worker to study the whole population for his research undertaking.

All research studies in education and other allied fields are conducted on the basis of small groups of individuals or small samples of products. Practically, their purpose is to draw conclusions and make generalisations about large groups of individuals, products or population on the basis of these sampling studies. Therefore, in any research study, the research worker should try his best to select such a sample as is truly representative of the whole population. The adequate size and representative nature of the sample depend partly upon the nature of the population to be studied and partly upon the purposes of the study. It is essential to maintain here that the size of the total sample be large enough to help the
research worker to valid analysis of the sub-samples used in the study.

During recent years sampling has been increasingly used in education to get necessary information about a specific population. Discussing the advantages of the sampling method, William G. Cochran (1953) writes: "In every branch of science we lack the resources to study more than a fragment of the phenomena that might advance our knowledge."

About the size of the sample, Guilford (1956) answering to the question, "How large a sample do I need"? remarks that it is not only a matter of members, it is also a matter of how the cases are selected. Guilford would consider greater than 50 as large sample.

For Garret (1971), "It is conventional to call any sample greater than 30 as large".

Hence the sample selected randomly for this study is large and, in accordance with the comments of Guilford and Garret, its size is justified.

3.2.1 Sampling in the Present Study

Keeping in view the limited resources of time, money and test material, a representative and limited sample consisting 200 graduate and post-graduate
trained teachers, both male and female, from government as well as privately managed, aided and recognised, high and higher secondary schools of Chandigarh, has been picked up randomly for the purpose of this study and out of these 200 teachers, 101 are female teachers and the remaining 99 are male teachers. Ninety four of them are from private and the remaining 106, from Government High and Higher Secondary schools of Chandigarh. They all belong to 23 different subjects as follows:

Table 1
Subject-wise description of the sample

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Teaching Subject</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>English</td>
<td>19</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>Higher Mathematics</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Higher Chemistry</td>
<td>8</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Higher Physics</td>
<td>6</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Mathematics</td>
<td>11</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>Arithmetic &amp; H.H.Accounts</td>
<td>-</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>General Science</td>
<td>6</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Biology</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Science (Phy.&amp; Chemistry)</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Hygiene &amp; Physiology</td>
<td>-</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Home Science</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>History</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>13</td>
<td>Social Studies</td>
<td>10</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>14</td>
<td>Civics</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>Geography</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Music</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>Commerce</td>
<td>4</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>Kitchen Gardening</td>
<td>-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>19</td>
<td>Economics</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>Hindi</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>21</td>
<td>Panjabi</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>22</td>
<td>Craft</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>Health Education</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Total (sex-wise)  99  101  Sample=200
Out of the 200 teachers, 16 teachers are M.A./M.Sc., M.Ed.'s; 64 teachers are M.A./M.Sc., B.T. or B.Ed.'s; 9 teachers are M.A./M.Sc./M.Com.'s only; 90 teachers are B.A./B.Sc./B.Com., B.T. or B.Ed.'s; 13 teachers are Giani/Prabhakar/M.A.(Hindi or Panjabi), O.T.'s, 4 teachers are B.A. plus diploma in fine arts/craft and the remaining four teachers are D.P.E.'s, that is, graduate along with diploma or degree in Physical Education.

Taking into consideration the complex nature of the problem, difficulties involved in the collection of data, scoring of rating scales and personality word list (P.W.L.), administration of modified Army Alpha Form 9—an intelligence test, statistical manipulation of data and last but not the least, the limited resources of money at the disposal of the investigator, the size of the sample was kept limited. In most of the other related studies the size of the sample was not very large.

Barr and others (1958) in Review of Educational Research indicated the following studies in this connection:

A research study of Hoarm who dealt with seventy-seven case studies; James Singletory took size of the sample seventy-four and McBeath and Andrews dealt with a sample of fifty-nine cases only.
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of School</th>
<th>Situation (Sector)</th>
<th>Type of School</th>
<th>Teachers taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DAV Higher Secondary School</td>
<td>8-C</td>
<td>Boys</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Govt. Girls Higher Secondary School</td>
<td>8-B</td>
<td>Girls</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>Govt. Girls High School</td>
<td>21-B</td>
<td>-do-</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Govt. High School</td>
<td>14</td>
<td>Co-educational</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Govt. Senior Model School</td>
<td>16-D</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Govt. High School</td>
<td>22-C</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Govt. Girls High School</td>
<td>23-A</td>
<td>For Girls only</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Govt. High School (Burail)</td>
<td>45</td>
<td>Co-educational</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Shivalik Public School</td>
<td>9-D</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Sarav Hitkari High School</td>
<td>15-C</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>S.D. High School</td>
<td>24-C</td>
<td>For Boys only</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>Moti Ram Arya High School</td>
<td>27-A</td>
<td>Co-educational</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>Guru Tag Bahadur Model School</td>
<td>29</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>Guru Nanak Khalsa High School</td>
<td>30-B</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>Guru Gobind Singh High School</td>
<td>35-B</td>
<td>-do-</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>Govt. Basic High School</td>
<td>20-D</td>
<td>Exclusively for boys</td>
<td>10</td>
</tr>
</tbody>
</table>

Total Sample = 200
The following precautions were observed to make the sample thoroughly representative of the whole population of High and Higher Secondary school teachers in the country:

1. Teachers from various sectors of Chandigarh were taken in the sample. The list of all the schools included in the sample is obviously seen in the preceding table No.2. The selection of the schools was random. Thus the sample was not restricted to any particular area what was widely spread in distant schools of Chandigarh.

2. Teachers both from Government schools as well as privately managed, aided and recognised schools, were included in the sample with equal proportion excepting four schools from where the number of teachers ranged from 15 to 24 as these were far bigger schools than the others in strength of teachers as well as pupils.

3. Teachers from boy schools, girl schools as well as co-educational schools comprised the sample.

4. Special attention was paid to include only trained graduate and post-graduate teachers, from high and higher secondary schools, who taught IX, X and XI classes only. Ten teachers from each school, except from four schools, at random order, were included in the sample to avoid the probability of any bias in selection.

In conformity with these precautions, the
characteristics of the sample under consideration be summarised as follows:

1. Out of the total sample of two hundred teachers, ninety-nine were male and one hundred and one were female teachers;

2. All the teachers were taken from the schools of Union Territory of Chandigarh.

3. The minimum qualification of teachers included in the sample was bachelor's degree in any discipline, with professional training. Eighty-nine of them had post-graduate qualifications;

4. Teachers included in the sample were within a wide range of teaching experience, ranging from one year to thirty-three years.

5. Age factor of the teachers also displayed a wide range that is from twenty-two years to fifty-six years.

6. Out of eighty-nine post-graduate teachers, six held master's degree in three disciplines with graduation in professional training, two possessed Master's degree in two disciplines plus master's degree in professional training, six had master's degree in two disciplines with
with Bachelor's degree in professional training, fourteen held Master's degree in one of the disciplines with Master's degree in professional education, fifty two got master's degree in one of the disciplines with bachelor's degree in teaching training and nine possessed only Master's degree in one of the available subjects.

3.3 Tools for Data Collection

The present problem involved in the collection of data descriptive of teaching success and data regarding some specific variables affecting success in the teaching profession. Data descriptive of teaching success were limited to the following criteria:

1. Report of the Head-Master/Principal
2. Opinion of the colleagues.
3. Rating of the teacher by the pupils.

As regards the data pertaining to some specific variables affecting success in the teaching profession, the investigation was limited to four variables namely self-concept, intelligence, experience and academic achievement of the teachers to see how these variables are correlated with success in teaching as well as among themselves, and whether there is any effect of them on success in Teaching. If so, to what extent it is.

The combined ratings by the head, colleagues and the
pupils was taken as a suitable criterion for success in teaching. No doubt, there is always subjectivity but in the words of Lead, "The ratings of principals and experts were closely in agreement when compared with pupil reactions. And pupil ratings made a unique contribution to teacher evaluation."

Arvil S. Barr (1952) enumerated teaching success by remarking, "Teaching success may be essentially a relationship between teachers, pupils and the other persons concerned with the educational undertaking, all affected by limiting and facilitating aspects of the immediate situation."

In Review of Educational Research, Barr et al. (1958) write that Amatora, Fetterholf, Flesher and Williams all found pupil evaluation of teachers worthwhile. Callis found that the Minnesota Teacher Attitude Inventory correlated significantly with ratings by observers and by students, but not with ratings by principals.

The general opinion was that as interaction between pupils and teacher increased so did teaching success.

Sanford Charles et al. in Encyclopaedia of Educational Research (1950) reported that a more comprehensive study was that of Odenweller. In this study, 560 Cleveland teachers, all graduates of Cleveland school of Education
were ranked by principals, vice-principals and supervisors, as to success in teaching. Correlations were computed between the average of the three rankings and the measures of personality. It was found to be as high as .825.

In the earlier decades of this century, most often the criterion employed for the ratings of teachers was rating by self, by pupils, by supervisors, by headmasters, etc. One of the most careful studies, which extensively employed the judgement of experts was conducted by Sandiford et al. at the University of Toronto (1937) using the Spearman Brown formula. They obtained reliability coefficients of .888 and .929 respectively, for the average ratings of two groups of experts and of .995 and .899 respectively for two groups of other judges. Correlations between the ratings were .748 and .707 respectively, indicating validities satisfactory to the investigations.

Eva Goodenough (1957), conducted a study with teachers in Escambia County in Florida, to determine the relative importance of various personality characteristics associated with teacher success, using forced choice rating scales. The criterion of success used was teacher's anonymous rating of their colleagues success in discipline. It was concluded that forced choice technique might prove a valuable method of isolating and determining the relative value of various traits of teaching success of teacher personality.
Granville, B. Johnson's study, "An Experimental technique for the prediction of teacher effectiveness" (1956-57) aimed to ascertain the relationship between qualities possessed by teachers and teacher effectiveness, with the aim of predicting teacher success. Method of observation, projective techniques for the analysis of teacher attitudes, the Rorschach, the age of each subject was obtained. The number of years of experience when age was held constant appeared to have little to do with teaching efficiency. The relationship between experience and effectiveness was .4939, age and effectiveness was -.51. It was also found that Method of observation appeared to be valuable tool for the estimation of teaching success.

Barry C. Munro (1964) worked on the problem "The Minnesota Teacher Attitude Inventory as a Predictor of Teaching Success" and found that it did not seem to have sufficiently high predictive validity for use in the selection of teacher training candidates at the University of British Columbia.

'The Bernreuter Personality Inventory' and 'the Bell Adjustment Inventory' could not be taken suitable tools for this study because the investigator doubted their objectivity. The limitations of these tools are that the person may not be willing to reveal correct facts about
himself or may not be in conscious possession of these facts. These devices, at their best, reveal that part of personality which is explicit or available to the person's scrutiny.

Taking into consideration the limitations of various tools and techniques discussed in the preceding paragraphs and with a view to collect data for the present investigation, the following tools of research were employed:

(a) **Tools for Success in Teaching (Criterion Variable)**

I. Teacher Rating Scale - to be filled in by the headmaster/principal.

II. Teacher Rating Scale - to be filled in by the colleagues.

III. Teacher Rating Scale - to be filled in by the Pupils.

(b) **Tools for other variables affecting success in Teaching**

I. Modified Army Alpha Form 9 - A verbal intelligence test for the teachers.

II. Self-concept scale (F.W.L.) by Dr.(Mrs.) Pratibha Deo to be filled in by the (subjects) teachers themselves to assess their self-concept.

III. Academic Qualifications and Experience Scale - to be filled in by the subjects - to get information of the amount of general and professional education, teaching experience, and
family background of the teachers.

3.3.1 Teacher Rating Scale (For the use of heads and colleagues)

Teacher Rating Scale, for the use of heads of schools and the colleagues of the teachers to be rated, was the same. It was devised by the investigator himself, under the kind guidance of Dr.(Mrs.) Pratibha Deo, to get the ratings of the teachers. All the maxims for the construction of rating scale were kept in mind. The total number of four chosen items in the scale was seventy. Care was taken that the items should cover all the main aspects of teacher behaviour pertaining to his success in the profession. The following aspects of teaching success were included in the rating scale:

1. Section A : Teaching Method and Subject Matter.
2. Section B : Relationships with Pupils and Discipline.
3. Section C : Personality Characteristics.
4. Section D : Relationships with Boss and colleagues.
5. Section E : Relationships with the parents of pupils.
7. Section G : Hobbies and other Interests.
This rating scale provided four point scale choices for rating each item. The scale is arranged in descending order of excellence and average category has not been supplied in between. It was done deliberately to avoid bias of neutral point from within these scale points. Higher score on rating scale indicated better teaching and vice versa. A copy of the rating scale is annexed in appendices.

3.3.2 Teacher Rating Scale (For the use of Pupils)

Teacher Rating Scale for students was also devised by the researcher himself, under the benign and apt guidance of the supervisor, Dr. (Mrs) Pratibha Deo, to get the ratings of teachers from their pupils. The scale, like the previous scale for heads and colleagues, was written in English, since the students (of XI, X and IX classes only) taken in the sample could understand and express well in English being the students of the high and higher secondary schools of Chandigarh, the city Beautiful where medium of instruction is mostly English in schools. On the first page of the rating scale, directions regarding the procedure of rating and a sample for illustration were given. The total number of items, like the previous scale for heads and colleagues, was seventy but the statements are not the same as are included in the previous scale. The aspects of teaching success, included in this rating scale, are under the same seven headings of sections as mentioned.
in the previous rating scale. This rating scale too provided four point scale for each item. The scale values for these four-choiced items were ranged in the descending order leaving no scope for average category in between. Higher scores on rating scale indicated better teaching success and vice-versa. A copy of this rating scale is also attached in the appendices for ready reference.

Each teacher was rated by the head and four colleagues on the previous scale. Similarly on this latter scale, each teacher was rated by five students. Those rated good or satisfactory and obtaining Teaching-success scores greater than the combined mean teaching success score of the whole sample have been categorised as successful teachers while the others have been considered unsuccessful in their profession. In all 112 teachers were rated successful by the combined mean teaching success scores of heads, colleagues and pupils. The remaining eighty-eight teachers were adjudged unsuccessful.

3.3.3 Self-Concept Scale (P.W.L.)

Self-concept is the projection of one’s personality. To measure self-concept is to assess personality of the person. An individual’s self-concept undergoes changes by the challenge offered by the circumstances of life and the way the others respond to him. The changed self-concept
projects the personality of the person in a different way. This leads the researcher to say that self-concept acts as a variable in personality and is measured by personality word list.

One of the popular methods of assessing self-concept is taking self-report of the subject. Sarbin (1952) prepared a personality word list (P.W.L.) containing 200 adjectives. He took most of the adjectives from Gough's list (1960) of 284 adjectives and some from Allport's list (1935). This personality word list was used by him to study the self-concept of males and females, neurotics and non-neurotics. Sarbin claims it to be of high validity. Reliability of the list by split-half technique ranges between .80 and .90. The list was rechecked by the subjects after a period of thirty days and the results showed that more than 70% of the same words were checked by them.

Dr. (Mrs.) Pratibha Deo (1963) made some modifications on Sarbin's list, which was used by her while working with her students for comparing the self-concepts of students from four different courses viz, science, arts, engineering and medicine at the time of their entering these courses. The reliability of this list was found to be .89.
She made further modifications in the list for making it fit for being split into two halves. This list was used in a study to find the effect of praise and blame on change of self-concept of an individual. The results showed that blame was more effective than praise and the change was more in the direction of reduction in the marking of desirable traits.

Another personality word list prepared by the same author (1964) has been used by her in assessing the self-concepts of Panjab University students pursuing different courses. In the present study this new personality word list has been used for assessing the self-concepts of teachers working in the high and higher secondary schools of the Union territory of Chandigarh.

Personality Word List (P.W.L.), adjective check list is generally described as self-concept scale. For the assessment of the self-concept, which has been considered one of the important factors contributing to success in teaching, Personality Word List designed and standardized by Dr.(Mrs.) Pratibha Deo, was used in this study. So self-report technique was employed by the investigator to measure self-concept of the teachers.

This personality word list consists of 209 words. These adjective words are divided into five different segments representative of certain traits as under:-
1. Intelligence
2. Aesthetic Development
3. Social Development
4. Character
5. Home Adjustment

This word-list was given thrice (each time a separate card) to measure 'ideal' self, 'perceived' self and 'social' self of the teachers as well as to measure their self discrepancies. First card represented 'The aim of my life is to be'; second card shows 'I am'; and the third card indicates 'Others regard me as.' These headings of the cards reveal that the first card was administered to measure 'Ideal' self; second, to measure 'perceived' self and the third, to measure 'social' self of the teachers.

'Ideal' self is the type of person what the subject wants to be; 'perceived' self is the type of person what is perceived by the subject of his own assessment and 'social' self is the type of person what is perceived by the subject of his own in relation to the comments of others around him.

The difference between any two of them shows the discrepancy as between 'ideal' self and 'perceived' self it is ideal-perceived self discrepancy; between 'perceived' self and 'social' self it is perceived-social self discrepancy and between 'social' self and 'ideal' self it is social-ideal self discrepancy.
Greater or lesser the discrepancy lesser or higher is the adjustment of the 'self'. This shows that higher the self-concept, higher the success in one's occupation as proper adjustment leads to success in vocation.

Self-concept, being defined as what one believes he is, is surely to be reflected in one's self report. There is no one-to-one relationship between the two. Self report is merely introspection. To what extent it approximates the subject's 'real' self-concept will depend upon, at least, the following factors:

I. Clarity of the individual awareness.
II. The availability of the adequate symbols for expression.
III. The willingness of an individual to co-operate.
IV. The social expectancy.
V. The individual's feeling of personal adequacy.
VI. His feelings of freedom from threat.

Recently self-concept has been considered, one of the important factors in educational success, by almost all modern psychologists and educational experts. In fact the involvement of self governs the action and reaction
of the individual. The one who thinks high of him can be said to have achieved higher as shown by some of the recent studies.

**Administration of the P.W.L.**

Three separate cards of P.W.L. were used at three different times. First, one card was given and then each of the teachers was asked to tick the words which, they think, apply on them, such as: graceful, kind, simple, lazy, etc. The directions given on the other side of the card were read out loudly and clearly so as to make the teachers understand how each of them was to mark his response by crossing one of the five squares given against each adjective word. They were requested to fill in the particulars, at the space provided for the purpose, on one side of the card. They were informed that the information collected through the P.W.L. would be kept strictly confidential and would never be used to their disadvantage and the purpose of the list was to try to help them. They were also requested to respond to all the words and not to leave any word unanswered. As there is no time limit for this P.W.L., so the investigator remained at the mercy of the teachers in the administration. Next time, on different occasion, after a gap of fifteen to twenty days, the same teachers were given the second copy
of the card and were asked to tick those adjectives which describe 'what they like to be', and actually they may or may not apply on them. The procedure was the same as discussed in the preceding paragraph.

The procedure was repeated third time by the same sample but this time the teachers were requested to tick those adjective words which represented them in relation to the comments of other people familiar to them. In the end of the test, they were once more reminded to check their responses and to fill in their particulars on the space provided in the P.W.L. card.

**Scoring Keys of P.W.L. Card:**

There are two separate keys for positive (+ve) and negative (-ve) dimensions of the personality. The keys are punched to enable the researcher to score within minimum time. Both positive and negative measures are taken, that is, scores for perceived self, for ideal self and for social self and the difference between Ideal and Perceived, Perceived and Social and Social Ideal as the discrepancy scores which indicate how much a person deviates from his actual self. The total score on each list is the correct response obtained with the help of keys.

3.3.4 **Modified Army Alpha Form-9**

The Army Alpha has been revised by various authors from time to time. 'The Modified Army Alpha Examination
Form 9* has been adopted by the Department of Education, Panjab University, Chandigarh, with major changes in tests 'D' and 'H'.

This test consists of eight subjects viz., four numerical and four verbal in alternative sequence. The total number of items for all such tests is 220 with a maximum score of 212 (68 for numerical and 144 for verbal). This is a 'speed' as well as 'power test'. Items of the tests are in ascending order of difficulty. Each test is allowed different timings and formula to score (Table 3).

Administration of Army Alpha Examination

Proper administration of the test requires cooperation of the subjects as well as the heads of the institutions. To avoid any disappointment, the investigator sought appointment before actual administration. Therefore, the test was administered judiciously in each of the schools included in this research study.

The number of subjects, that is, teachers ranged from 10 to 12 at a time. Before the test was administered, the nature of the test was explained so as to establish a proper rapport with the teachers. This is essential for every test to be administered. The test booklets and blank-papers (for extra and lengthy calculations) were supplied to fill up their particulars at the space, provided for the
purpose, on the first page. The teachers were asked not to open the test booklets unless they were told to do so. Generally, the head of the institution was there to help the investigator in the proper administration of the test.

The instructions printed on every page were read out loudly in clear and natural manner. The timings for every sub-test were written on the black-board to avoid confusion. Though the instructions are printed on the top of the each sub-test yet they were read out loudly and explained clearly before every subsequent sub-test started. The samples (solved samples) were explained to make the test clear.

The time was controlled by the stop watch. Signal to start and to stop, 'ready-go' and 'stop' were given for every sub-test. The time allowed for each sub-test is detailed below:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sub Test</th>
<th>Time Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test A</td>
<td>1½ minutes</td>
</tr>
<tr>
<td>2</td>
<td>Test B</td>
<td>2 minutes</td>
</tr>
<tr>
<td>3</td>
<td>Test C</td>
<td>5 minutes</td>
</tr>
<tr>
<td>4</td>
<td>Test D</td>
<td>3 minutes</td>
</tr>
<tr>
<td>5</td>
<td>Test E</td>
<td>3 minutes</td>
</tr>
<tr>
<td>6</td>
<td>Test F</td>
<td>2 minutes</td>
</tr>
<tr>
<td>7</td>
<td>Test G</td>
<td>4 minutes</td>
</tr>
<tr>
<td>8</td>
<td>Test H</td>
<td>1½ minutes</td>
</tr>
</tbody>
</table>

Total time : 22 minutes
Answer-sheets and test booklets were immediately collected after completion of the test. As it is a time-bound examination to test speed and power of the subjects, so not a single minute more can be given to any person than what has been prescribed for each sub-test.

**Scoring key of the Army Alpha Examination:**

1. Sub-Test A & G = Half Mark for each correct response, that is, R/2.
2. Sub-Test B = From 1 to 8 items - 2 marks each, from 9th onwards - 3 marks for each correct response.
3. Sub-Test C, D and E = 1 mark for each correct response.
4. Sub-test F and H = R-W (Right-Wrong) to avoid guessing.

Total score = Sum of all the scores on all sub-tests.

Why did the investigator use Army Alpha Examination?

No doubt, there are other tests of intelligence according to Indian conditions like Jalota's and Paryag Mehta's Mental Ability Test, but none of them is for adults. Army Alpha Test, though standardized and revised from time to time, is quite comprehensive in measuring mental ability and verbal intelligence.

3.3.5 Academic Qualifications and Experience Scale

It is simply an enquiry form or questionnaire that was designed by the researcher himself to trace the following:
1. Section A : Personal Particulars.
2. Section B : Academic Qualifications
3. Section C : Family Particulars
4. Section D : Teaching Experience

In the first section A every teacher was requested to write his name, age, sex, domicile, nationality, father's name, father's occupation, marital status, number of children, permanent and present addresses.

In Section B, they were asked to write their general education starting from Matric to onwards, in detail, and professional education whatsoever they had attained along with year of passing each examination, name of Board or University giving such degree or diploma, subjects offered, division and distinction got in these examinations.

Section C was about family particulars where all teachers were supposed to write, in blank columns, the qualifications, professions, positions and residence (Rural/Urban) of father, mother, wife/husband (if married), brothers, sisters and other relatives living with them. They were requested not to conceal any thing in these regards.

In the last section D they were to fill up columns headed with 'Institution(s), where served,' 'Date of joining', 'date of leaving', position', 'classes taught' and 'subjects taught', so that a relevant and sufficient information might
be obtained about their experience in teaching profession.

As far as the scoring of this enquiry form is concerned, it was done in the following ways :-

1. One mark was assigned to one year of teaching experience, two for two years, three for three years, and so on.

2. At least fourteen marks for graduation in general education (B.A., B.Sc./B.Com) and one for professional education B.Ed./B.T./O.T./L.T. were given to every teacher included in this study. For additional qualifications, one mark for M.Ed., two for M.A./M.Sc./M.Com. and one for Gyani/Prabhakar were assigned to get academic achievement or academic qualification scores from these teachers.

3.4 Data Collection

The data were collected personally from high and higher secondary, government and private, schools of Chandigarh by the investigator himself. Various research tools like rating scale, P.W.L. test, Modified Army Alpha Examination Form-9, etc. were employed for the purpose of data collection. It took at least 20 days in one school, for the researcher, to collect requisite data.

Before starting the collection of data, the formal
appointment was taken and head's help was also sought from the concerned school. The research tools were administered to the head, teachers (subjects), their colleagues and pupils during the school hours, according to the scheduled programme. All these tests were given in strictly controlled conditions.

Teacher Rating Scales were administered to the heads, colleagues and pupils personally. About 216 copies of the 'Academic Qualifications and Experience Scale' were distributed among the high and higher secondary school teachers of Chandigarh and they were the teachers who taught only XI, X or IX classes. As many as five pupils, four colleagues and a head rated each teacher. The heads, staff members and students of these schools showed a great amount of interest in this research project and co-operated fully with the investigator. The behaviour of the teachers as well as of the students was, on the whole, very nice and satisfactory. But some of the teachers, female teachers particularly, hesitated to give their names and the required information. They agreed to do so only when they were assured by the investigator that their responses would be kept strictly confidential and be used for research purpose only. Thus the investigator had a very pleasant experience in the collection of data.

Besides these three rating scales, three other tools
of research - 'Personality Word List Cards', 'Modified Army Alpha Examination Form 9' and 'Academic Qualifications and Experience Scale' were administered to the same sample of 216 teachers. To obtain reliable and valid data and to prevent results from being vitiated, from lack of uniformity in the procedure of administration, it was thought essential to visit the institutions concerned and administer these tests under personal supervision because the administration of these tools was not possible otherwise. Uniformity of procedure of administration and giving directions were strictly maintained in the case of the two tests, in particular and the previous three rating scales, in general.

Personal visits, to the institutions concerned, had also an additional advantage. The rating scales were personally explained to the headmasters/principals, the teachers and the students and they were requested to be as impartial, objective, precise and cautious of their ratings as possible. It was clearly brought to their notice that the results were likely to be distorted without their co-operation in this respect. Further they were fully assured that their ratings were intended for research purpose only and would be kept strictly confidential.

Thus the personal visits of the researcher, to the various high and higher secondary schools, ensured objectivity, reliability and validity of data, as well as facilitated the
quick collection of the same.

After the collection of data there comes the question of scoring. After careful scrutiny of the tools of research used and filled up by the teachers, sixteen data-sheets of the teachers were rejected as they were found incomplete in one way or the other. Sixteen teachers, whom these data sheets belonged, were excluded from the representative sample and the remaining 200 teachers were considered for final analysis and interpretation. Methods of scoring employed in this study are very simple.

3.4.1 Scoring of Teacher Rating Scale (for the use of heads and colleagues)

Since four-point scale was provided for rating and the scale ranged in descending order of magnitude, three marks were given for the item rated highest, two for that rated higher, one for rated high and zero for low. The scores were added on all the items which provided the total score for the individual representing his teaching success on this scale.

3.4.2 Scoring of Teacher Rating Scale (for the use of pupils)

Since it was also a four-point scale, therefore, similar procedure for scoring as applied to heads' and colleagues' ratings, was also applied to the rating scale for pupils. This scale also ranged in descending order of values given to four chosen items, that is, three scores
were given for the item rated the highest, two for the higher, one for the high and zero for the item rated low. The scores were added on all the items which provided the total score for the individual representing his teaching success pertaining to this scale. The combined mean score of ten such scores was calculated from the rating scales one, rated by the head; four, by the colleagues; and five, rated by the pupils to get the actual teaching success score for each of the 200 teachers.

3.4.3 Scoring of Academic Qualifications and Experience Scale

As far as the scoring of this inquiry form is concerned, it was done in the following manner:

I. One mark was assigned to one year of teaching experience, two marks for two years, three marks for three years, and so on. In this way experience scores for all the teachers were computed.

II. At least fourteen marks for graduation in general education (B.A./B.Sc./B.Com) and one for professional training (B.Ed./B.T./L.T./O.T.) were given to every teacher included in the sample for this study. For additional qualifications, one mark for M.Ed., two for M.A./M.Sc./M.Com. and one for Giani/Prabhakar were assigned to get academic achievement or academic qualifications
scores of these teachers. The total of marks for all the various qualifications of each teacher was regarded as academic achievement score or amount of education score.

3.4.4 Scoring of the Army Alpha Examination:

The test scripts were scored with the help of scoring key. Formulae for scoring all the sub-tests are given below:

I. Sub-Test A & G = Half mark for each correct response, that is, R/2 was assigned.

II. Sub-Test B. = From 1 to 8 items --- 2 marks each, from 9th onwards --- 3 marks for each correct response were given.

III Sub-Test C, D and E = One mark for each correct response was allotted in these sub-tests.

IV Sub-Test F & H = R-W (Right-Wrong), to avoid guessing was computed.

Total intelligence score for each teacher was calculated by adding all the scores on all these sub-tests of the Army Alpha Examination Form 9.

3.4.5 Scoring of P.W.L. Card

There are two separate keys for positive (+ve)
and negative (-ve) dimensions of the personality. The keys were punched to enable the researcher to score the card within minimum time. Both positive and negative measures were taken, that is, scores for 'ideal self', 'perceived self' and the 'social self', and the difference between 'perceived' and 'ideal', 'perceived' and 'social', and 'social' and 'ideal' selves as the discrepancy scores, which indicate how much a person deviates from his actual self. The total score on each list is the correct response obtained with the help of keys.

3.5 Techniques used for Analysis of data:

Raw scores carry no weight and meaning by themselves, unless some statistical techniques are employed to test the significance of the scores.

Therefore, after sorting data for final scores, the composite mean scores of teaching success, self-concept, intelligence, experience and academic qualifications for each teacher were obtained to make proper treatment of data on all the different variables. Composite scores were obtained separately for male teachers, female teachers and the combined sample, and also school-wise, that is, for private and government school teachers separately.

Percentage of being successful, frequency distributions of all successful and unsuccessful teachers, frequency polygons of all variables, measures of central tendency as mean and median, measures of variability as standard
deviation and semi-interquartile range, kurtosis and skewness were calculated for the total sample on all variables. Sex-differences and school-wise (government and private) differences were also worked out.

Product moment coefficient of correlations between 'teaching success' on one side and self-concept, intelligence, experience and academic achievement on the other, were calculated. Correlations among the latter four variables, taken two at a time, were worked out to find inter-relationships of all of them.

Significance of the obtained co-efficients of correlations was also tested statistically by applying appropriate formulae prescribed for this purpose.

All these statistical techniques were applied for the analysis of data collected, on different variables, for the investigation of this research piece.