Chapter III

RESEARCH METHODOLOGY

Both primary and secondary data have been collected for this study. The major sources of secondary data include reports and documents published as well as unpublished from the office of Director of Public Instruction (Colleges) Punjab, Principals of various colleges, Economic and Statistical Organisation of Punjab and Establishment branches of various Universities.

(i) Data Collection

Primary data have been collected through a structured questionnaire. The questionnaires were administered to the teachers working in various Universities and colleges of Punjab and Chandigarh. Their number was very large, so this necessitated to draw a sample out of them. Study has been conducted in the state of Punjab. The four districts undertaken and selected for the purpose of the present study are Ludhiana, Jalandhar, Hoshiarpur and Sangrur along with the city of Chandigarh. These four districts have been selected on the basis of the number of teachers as shown in a table 3.1.
Table 3.1

District-wise Teachers in Punjab

<table>
<thead>
<tr>
<th>District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ludhiana</td>
<td>1072</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>1053</td>
</tr>
<tr>
<td>Amritsar</td>
<td>679</td>
</tr>
<tr>
<td>Patiala</td>
<td>527</td>
</tr>
<tr>
<td>Hoshairpur</td>
<td>4688</td>
</tr>
<tr>
<td>Gurdaspur</td>
<td>447</td>
</tr>
<tr>
<td>Faridkot</td>
<td>409</td>
</tr>
<tr>
<td>Sangrur</td>
<td>356</td>
</tr>
<tr>
<td>Kapurthala</td>
<td>311</td>
</tr>
<tr>
<td>Ferozepur</td>
<td>285</td>
</tr>
<tr>
<td>Bhatinda</td>
<td>253</td>
</tr>
<tr>
<td>Roopnagar</td>
<td>248</td>
</tr>
</tbody>
</table>

Mean = 6108/12 = 509.


Two districts, namely, Ludhiana and Jalandhar have largest number of teachers and hence were selected for the study. Another district around state average (i.e. 509) viz,
Hoshiarpur was included in the sample. Actually Patiala district is more near to the average (having 527 teachers) to the average, but due to inclusion of Punjabi University Patiala in the sample, the next district near average, namely, Hoshiarpur was selected. From the districts below state average (namely Sangrur, Kapurthala, Ferozepur, Bhatinda and Roopnagar) Sangrur has the highest number of teachers. Hence it was included in the sample.

(ii) Field Work

Field work started by visiting the office of Director of Public Instructions (Colleges) Punjab with an objective to get the list of total number of institutions in these four sample districts and the break up of teachers working under various faculties. The office of the Economic and Statistical Organisation of Punjab was visited to get an appropriate number of teachers working in government, non-government, rural and urban colleges.

After that a request letter in an envelope containing a self-addressed inland was sent to all these colleges (according to the list of the Director of Public Instruction, Colleges) for sending information about the total number of teachers as well as faculty-wise break up in their respective institution at the earliest. Such information was also collected personally, wherever it was possible. All the three Universities were repeatedly visited and the appropriate number
of teachers under the four faculties are taken from the establishment branches of these Universities.

(iii) Sampling

In the sample districts and three universities there are approximately 4500 teachers. From this population a sample of 320 teachers has been drawn. The sample constitutes 14 percent of the universe. At the time of drawing the sample from colleges and universities, due weightage has been given to various faculties (Arts, Science, Physical Education and Library Science — see Table 3.2) and categories of teachers.

In case of colleges due weightage has also been given to government and non-government colleges and their location (i.e., rural and urban).

The population is scattered over a large area and due to the limitation and difficulties in obtaining the information, it has been decided to select 3 to 4 colleges from each district on random basis.
### Table 3.2

**Total Sample (District, College and Universities) Faculty-wise**

<table>
<thead>
<tr>
<th>District</th>
<th>Arts</th>
<th>Science</th>
<th>Physical Education</th>
<th>Librarians</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ludhiana</td>
<td>30</td>
<td>14</td>
<td>4</td>
<td>4</td>
<td>52</td>
</tr>
<tr>
<td>Jalandhar</td>
<td>26</td>
<td>13</td>
<td>4</td>
<td>3</td>
<td>46</td>
</tr>
<tr>
<td>Hoshiarpur</td>
<td>26</td>
<td>13</td>
<td>4</td>
<td>4</td>
<td>47</td>
</tr>
<tr>
<td>Sangrur</td>
<td>26</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>42</td>
</tr>
<tr>
<td>Chandigarh</td>
<td>20</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>128</strong></td>
<td><strong>57</strong></td>
<td><strong>20</strong></td>
<td><strong>17</strong></td>
<td><strong>222</strong></td>
</tr>
</tbody>
</table>

**UNIVERSITIES**

<table>
<thead>
<tr>
<th></th>
<th>Arts</th>
<th>Science</th>
<th>Physical Education</th>
<th>Librarians</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>15</td>
<td>11</td>
<td>3</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Punjabi</td>
<td>15</td>
<td>11</td>
<td>4</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>G.N.D.U.</td>
<td>15</td>
<td>11</td>
<td>4</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td><strong>Grand Total of the whole sample.</strong></td>
<td><strong>45</strong></td>
<td><strong>33</strong></td>
<td><strong>11</strong></td>
<td><strong>9</strong></td>
<td><strong>98</strong></td>
</tr>
<tr>
<td>x</td>
<td>173</td>
<td>90</td>
<td>31</td>
<td>26</td>
<td>320</td>
</tr>
</tbody>
</table>

Considering the time and resource constraints, a random sample ranging from 30 to 50 teachers from each sample district and University has been obtained (Table 3.2). In this way 222 college teachers (from rural-urban, government and non-government institutions) and 98 teachers from three Universities (Punjab, Punjabi and Guru Nanak Dev) constitute the sample size.

(iv) **Data Collection Instruments**

After the selection of the sample the next step was to
choose suitable data collection instruments. The selection of tools for a particular study depends upon various considerations such as the objectives of the research, availability of suitable tests, researcher's personal competence, techniques of scoring and interpretation.

Out of the numerous data collection techniques employed in job satisfaction studies in India and abroad included questionnaires, Interviews, rank order studies, projective techniques (e.g. sentence completion test), critical incidence techniques etc.

However, the most commonly used method to collect information on job satisfaction has been the questionnaire; for it provides a more adequate and practical method of measuring employee's attitudes & opinion. At the same time, it is time saving as well as economical. Anonymity of the responses is also adequately ensured.

(v) Questionnaire

A blue-print has been developed for the construction of the questionnaire and to determine the type of items, number of items to be included, scales have been prepared (suited to both categories) to measure the degree of satisfaction, while preparing statements, care has been taken for the reasons mentioned below:

(i) Both categories (University and college) of teachers
deal with different groups of students.

(ii) They also work under different types of management.

(iii) Working conditions of University teachers differ considerably from those of college teachers.

(iv) The college teachers have to teach more than one standard of students simultaneously unlike university teachers. However to state in brief, the satisfaction scale consisting of 20 statements was printed along with socio-personal and job factors scale consisting of motivator and hygiene factors.

(vi) **Preparation and selection of statements**

The statements or items for the measurement scales were both independently formulated and selected from the literature. Since statements obtained from literature mainly pertaining to industrial situations and factory workers, those again had to be modified to suit the locale, and intents of the study. Care was taken to avoid such statements which were considered ambiguous, interpreted in more than one way and also others, which were considered irrelevant in the context of the objectives of the study.

Care was also taken to couch each statement in simple, clear and direct language as far as possible. However the use of certain technical terms from the social sciences and from
other branches of literature could not be avoided. Different terms of the statements were formulated. Keeping in view the academic and professional level of the respondents, the statements kept for the draft questionnaire were carefully screened and edited to remove any surface redundancies.

The statements in the 1st part of the questionnaire seek information about personal and social aspects of the respondents. It seeks to get basic information related to the respondents. Personal bio-data related to the age, educational qualification, number of family members (Dependents) family income, rural/urban background parental occupation and anxiety about the job etc. This information was useful to study the effect of various socio-personal variables on the effectiveness of various attributes to contribute towards job satisfaction.

The second part consists of questions relating to various attributes which have an indirect or direct reflection on the job satisfaction among the respondents.

The third part of the questionnaire has been selected, basis on the Herzberg's the theory (motivator and hygiene) in which five motivator factors and six hygiene factors were included to know the effect of these different factors on the level of job satisfaction of the respondents.

(vii) Measurement of job satisfaction scale

The level of job satisfaction has been measured on a five
point Likert type of scale. Likert scaling techniques provides a 5 point scale and assigns each of the five positions, a scale value.¹

The scores have been obtained by using the following scoring criteria for various categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much satisfied</td>
<td>5</td>
</tr>
<tr>
<td>Satisfied</td>
<td>4</td>
</tr>
<tr>
<td>Can't say</td>
<td>3</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>2</td>
</tr>
<tr>
<td>Very much dissatisfied</td>
<td>1</td>
</tr>
</tbody>
</table>

The rating categories in respect of scales used to measure the relative contribution of various job factors to job satisfaction have been accorded the following scores:

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
</tr>
<tr>
<td>Can't say</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
</tbody>
</table>

(viii) Improvement of scale through expert opinion

After preparing the required scale, it was discussed with experts. The issues discussed with experts were, suitability of the statements as indicators of the study variables, semantic or phraseological difficulties which according to them was likely to hinder a correct understanding of statements on the part of the study variables.

The first obvious advantage of the discussion with experts was the interaction amongst them, which could not be obtained through individually mailed drafts. Secondly, it did provide a suitable forum to raise a discussion on the scale items in order to secure a broader set of views prior to the pre-testing of draft instrument. This enabled them to cross-check their view points on the spot in an atmosphere of informality. On the basis of this discussion with experts, draft scales were finalised for pre-testing purposes.

(ix) Variables

The selection of the variables has been mainly based on the review of literature in the area of job satisfaction. The present study involves two kinds of variables, namely (I) independent or Explanatory variables and (II) Dependent variable (Job satisfaction).

It is evident that the number of variables to be included
depends on the nature of the phenomenon being studied and the purpose of the research.

In the present study, the independent variables consisted of (A) personal and social characteristics and (B) job factors. The list of independent variables is shown in the Table 3.3.

**Table 3.3**

(A) **Personal and social characteristics** (List of Variables)

(a) Age  
(b) Educational Qualification  
(c) Marital Status  
(d) Rural-Urban Background  
(e) Parental Occupation  
(f) Type of Family  
(g) Service Experience  
(h) Number of Dependents.  
(i) Family Obligation  
(j) Family Income  
(k) Distance of posting from home  
(l) Anxiety scale

(a) **AGE**

Age has been defined as the chronological age of the respondents at the time of data collection, which was rounded off to the nearest year. For quantification purposes, it was
coded from 1 to 5 and it was also taken in the exact form as per the information given by the respondents.

(b) **EDUCATIONAL QUALIFICATION**

It has been defined as the highest academic qualification of the respondents at the time of data collection. It was categorised as M.A/M.Sc, M.Phil., Ph.D. and any other. For quantification purpose and for working out correlation arbitrary scores 1,2,3 and 4 were assigned respectively.

(c) **MARITAL STATUS**

It has been defined as the status of the respondents in terms of his being married, unmarried, divorcee or widower. For quantification, arbitrary scores of 1,2,3,4 were assigned respectively.

(d) **RURAL URBAN BACKGROUND**

From background has been meant whether the respondents belonged to a rural or urban area. For quantification purpose, arbitrary scores of 1 and 2 were assigned respectively.

(e) **PARENTAL OCCUPATION**

It has been implied whether the occupation of the parents of the respondents was farming, business, service or any other. For quantification purpose, arbitrary scores of 1,2,3,4 were assigned respectively.
(f) TYPE OF FAMILY

It has been ascertained whether the respondents belonged to a joint (living with parents, brothers and sisters) family or living in a nuclear (with his wife/husband and children) family. For quantification purpose, an arbitrary scores of 1 and 2 were assigned respectively.

(g) SERVICE EXPERIENCE

It has been defined as the length of service of the respondents in years on the said post on the date of data collection, which was rounded off to the nearest year for convenience. For quantification purpose arbitrary scores of 1, 2, 3, 4 were assigned respectively and actual number of years were also taken.

(h) NUMBER OF DEPENDENTS

It has been meant as the total number of family members, excluding the respondent himself, who is economically independent. For quantification purpose, arbitrary scores of 1, 2, 3, 4 were assigned and also actual number of dependents were taken (economically dependent on the respondents).

(i) FAMILY OBLIGATION

It refers to the compulsions or binding on the respondent in relation to his family; means towards the education
marriage, house building etc. (of brothers, sisters, sons and daughters). For quantification purpose, arbitrary scores of one and zero (for yes & No) have been assigned.

(j) FAMILY INCOME

It refers to the respondents total family income (monthly income in rupees) from all sources, also regarding the sufficiency of the money return from his job, for example, in terms of leading comfortable life, commensurate with the job responsibilities and comparable favourably with those in similar jobs in other departments. For quantification purposes and for correlation, an arbitrary scores of 1, 2, 3, 4, 5 and 6 were given to the different ranges of pay. Family income has also been taken as such given by the respondents (in actual amount).

(k) DISTANCE OF POSTING FROM HOME

It has been operationalised as the actual distance in kilometers of the respondent's place of posting (headquarter) from his residence. For quantification purposes, arbitrary scores of 1, 2, 3, 4 were given, also the actual number of kilometer have been taken.

(l) ANXIETY SCALE

It refers to the various situations in job which occur from time to time and how the respondent feels and takes in
different situations. The nine statements, comprising the situational anxieties arising on the job were scored negatively. The arbitrary scores of 5 to 1 have been assigned for the very much dissatisfied (given score 5) to the very highly satisfied.

(B) JOB FACTORS

Following Herzberg's theory motivators and Hygiene factors have been selected. Herzberg's theory of motivation and hygiene factors made a major contribution to our knowledge and understanding of the nature of job satisfaction. He proposed that satisfaction depends predominantly upon the satisfaction of psychological needs (motivators) while dissatisfaction results, predominantly from the non-satisfaction of physical needs (hygiene).²

Keeping this in view, five motivators and six hygiene factors have been included in this study. One of the hygiene factors adequacy of salary and fringe benefits was however split into two different factors for measurement purposes. A list of both motivators as well as hygiene factors is given in table 3.4.

(A) **Motivator Factors**

1. Feeling of Achievement  
2. Ability Utilisation  
3. Recognition and Regard  
4. Freedom of Expression  
5. Scope for Professional Growth  

(B) **Hygiene Factors**

1. Behaviour of Immediate officer  
2. Security and Advancement  
3. (a) Adequancy of Salary  
3. (b) Fringe Benefits  
4. Administrative set-up and Policies of Organisation  
5. Physical conditions of Work  
6. Social Status Attached to the Job  

**B.I. MOTIVATING FACTORS**

**B.I.(i) FEELING OF ACHIEVEMENT**

This factor refers to the intrinsic satisfaction on the part of the respondents in terms of his success on the job in regard to his day to day assignments and completion of the targets fixed by the department and their problem solving.
B.I.(ii) **ABILITY UTILISATION**

It refers to the extent up to which the respondent can use his ability in planning and executing the various policies of education laid down from time to time.

B.I.(iii) **RECOGNITION AND REWARDS**

It has been operationalised as the perceived scale earned by the respondent regarding the availability of recognition and rewards such as verbal encouragement, appreciation from superiors in the shape of some certificate or cash rewards on his job.

B.I.(iv) **FREEDOM OF EXPRESSION**

It is the extent up to which a respondent enjoys freedom of expressing his views about the departmental/institutional policies and can dare to comment on the various decisions and actions and can make suggestions to his superior without any loss of confidence. It has been assessed by the mean scores earned by each respondent on its statements.

B.I.(v) **SCOPE FOR PROFESSIONAL GROWTH**

It refers to the scope for promotion etc. in the professional rank or status (especially in the matter of high pay and scale) and authority mainly on the basis of length of service or on the basis of confidential reports. It is the mean
scores of respondent's estimate on the job, scope for his development in the various fields as improvement in knowledge, betterment of abilities in planning and growth through participation in different activities etc.

B.II. HYGIENE FACTORS

B.II.(i) BEHAVIOUR OF IMMEDIATE OFFICER

The mean scores earned by the respondents in all the ten statements concerning behaviour with him on the job and off the job situations from his superior (may be the principal, management and any other) have been taken to the consideration, specially the attitude of the boss in terms of impartiality and fairness. It gives the respondent's judgement regarding the behaviour, nature and help as well.

B.II.(ii) SECURITY AND ADVANCEMENT

The mean scores of the respondents in regard to the extent to which he feels that his job provides him with enough security, with lesser degree of insecurity and side by side equal chances for advancement as well. It was respondent's self rating about the availability of a permanent and steady employment with at least no chance of losing it in normal circumstances. Promotion in professional avenues in rank and status was taken into account.
B.II.(iii) ADEQUACY OF SALARY AND FRINGE BENEFITS

This refers to the respondent's perception regarding the sufficiency of the money returns from his job. The respondents views have been taken on nine indicators out of which four for range of monetary benefits and five for the other benefits apart from the monthly salary (such as medical facility, provident fund facility, L.T.C., retirement facilities etc.) by way of which he can lead a comfortable life.

B.II.(iv) ADMINISTRATIVE SET UP AND POLICIES OF DEPARTMENT AT STATE LEVEL

The respondents rated the statements concerning the policy and administration under which they are working; whether the policies are fair or unfair, transfers made, evaluation of their work done, fair recruitment, on time or delay in the release of pay and fixation of the next higher scales etc. were considered.

B.II.(v) PHYSICAL CONDITIONS OF WORK

It refers to the perceived satisfaction of the respondents about the facilities, which he enjoys at his work and others such as adequacy or inadequacy of transport, medical facilities, housing facilities and office accommodation, furniture, stationary, class-rooms, laboratory and libraries etc.
SOCIAL STATUS ATTACHED TO THE JOB

It is the indicator of the respondent's rating about his job, whether he is regarded in the society as a useful member. He also compares his social status with that of employees working in other similar or otherwise departments. He also compares his knowledge and work etc. with other fellow beings (just as, within teachers, comparing a teacher working in a University and in a college).

DEPENDENT VARIABLE

In the present study, the dependent variable is the job satisfaction. Hence there is a need to develop appropriate measurement scale suitable to the purpose of this study.

Keeping into account the existing literature and opinion of the experts in the field, two such scales were constructed. One each to measure the level of job satisfaction and the relative contribution of motivator and hygiene job factors to job satisfaction.

The job satisfaction of the respondents is measured in terms of both the needs, attitudes to obtain a broader response. In terms of measurement, the operational definition of job satisfaction in this study is, 'how much is desired by the person and how much he is actually getting out of his job'. In other words, job satisfaction has been operationalised as
the cumulative score obtained by the respondent in relation to the selected facets of a job. The difference between the strength of 'should be' and 'actually is' given a score for each item and a summation of scores for all these items gave a total score of job satisfaction.

(x) PRE-TESTING

A preliminary testing was conducted on a few teachers (35 only) with the purpose of testing the suitability and ease with which they understood the purpose of different scales.

The draft questionnaire was administered on a group of teachers from government, non-government and rural-urban (from different spheres and from different faculties) setting. This was helpful in making some useful changes. Moreover, it helped in refining the manner of presentation, probing and gaining confidence of the respondents.

(xi) RELIABILITY AND VALIDITY OF THE TOOL

The reliability of the scale is of primary importance. It is an index of the extent to which repeated measurements yield similar results.³ The concept of reliability has to do with consistency of measurements. So, an instrument is said to be reliable if it consistently yields the same results when

repeated measurement are taken on the same subject under same condition.

Since one does not know a person's true score, one can never determine reliability precisely. It can only be estimated from the obtained data. Out of the various methods of estimating reliability (in this study), the reliability of the constructed scales were worked out by using two methods, namely split-half technique and cronbach Alpha.

In the split half method (odd even design), the scale was divided into two parts by keeping statements with odd serial numbers in one part and those with even numbers in the second part.

TABLE 3.5
THE RELIABILITY CO-EFFICIENT OF DIFFERENT SCALES ARE GIVEN BELOW

<table>
<thead>
<tr>
<th>SPLIT HALF METHOD</th>
<th>Co-efficient</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Overall level of job satisfaction</td>
<td>.88</td>
<td>.94</td>
</tr>
<tr>
<td>II. Motivator Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1.(1) Feeling of Achievement</td>
<td>.89</td>
<td>.94</td>
</tr>
<tr>
<td>M2.(2) Ability Utilisation</td>
<td>.94</td>
<td>.97</td>
</tr>
<tr>
<td>M3.(3) Recognition and Rewards</td>
<td>.82</td>
<td>.91</td>
</tr>
<tr>
<td>M4.(4) Freedom of Expression</td>
<td>.85</td>
<td>.92</td>
</tr>
<tr>
<td>M5.(5) Scope for Professional growth</td>
<td>.94</td>
<td>.97</td>
</tr>
</tbody>
</table>
III. Hygiene Factors

H1.(1) Behaviour of immediate officer. .79 .89
H2.(2) Security and Advancement .77 .88
H3a.(3) Adequacy of Salary .83 .91
H3b.(4) Fringe Benefits .86 .93
H4.(5) Administrative set up and Policies of Department at state level .91 .96
H5.(6) Physical conditions of work .89 .94
H6.(7) Social Status attached to the job .88 .94

Formula using split-half method

\[ rtt = \frac{2r_{xy}}{1+r_{xy}} \]

The co-efficient of correlation between scores of the two parts of the scale was worked out. The correlation co-efficient gave the reliability of half the test. Therefore it was necessary to correct the reliability co-efficient before taking it as evidence of reliability. The equation which is referred as the Spearman brown correlation for split half reliability was used in finding out the reliability co-efficient of full length (2nd items) scale.4

The formula is given below:

\[ rtt = \frac{2r_{xy}}{1 + r_{xy}} \]

Where \( rtt \) = reliability co-efficient of scale
\( r_{xy} \) = correlation - coefficient between two parts of the scale

The reliability co-efficient of different scales are given in table 3.5.

A sample of about 35 teachers both from government and non-government colleges were taken up for these two tests. For obtaining the over all estimate, this sample drawn for reliability and validity of the scale was combined and treated as one sample of 320 teachers.

A measuring device must be reliable and valid. The reliability of a measuring instrument pertains to the degree to which it measures consistently what ever it does. Guilford observes that "reliability is the proportion of true variance in obtained test-scores". 5

\[
\text{Co-efficient of Reliability} = \frac{\text{True variance}}{\text{Total variance}}
\]

From the obtained responses, the split-half method with odd even design was most appropriate and was employed to derive

The co-efficient of reliability.

"The split half method is best suited to bring out the index of internal consistency."\(^6\)

Another test called Cronbach Alpha was also applied for testing the reliability of the scale. The formula for the same is:

\[
\alpha = \frac{n}{n-1} \cdot \left( 1 - \frac{\sigma_i^2}{\sigma_t^2} \right)
\]

Where \(n\) is the number of items
\(\sigma_i\) = is the standard deviation of individual items and
\(\sigma_t\) = is the standard deviation of the total scores.

(**ii**) VALIDITY TEST FOR MEASUREMENT SCALES

Since psychological measurement is largely indirect, there arises the problem of validity. It has to be ensured that the measuring instrument measures precisely for what it is designed to measure. It must be capable of achieving the purposes it is intended to serve. As compared to psychological tests, obtaining validity for job satisfaction scales in a difficult task.

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This is due to the reason that relatively few criterion measures are available with reference to which job satisfaction scores could be validated.

The reliability is a necessary but not a sufficient condition for an evaluation device to be relevant. It ought to be valid to meet this sufficient condition. According to Guilford "Validity may be stated in terms of reliability".\footnote{Guilford (1971), \textit{op. cit.}, p.401.} The validity calculated from reliability is called intrinsic validity and marked out as; validity = $\sqrt{rtt}$

Content validity has broadly been determined by logical or empirical methods. Since the content of the universe of the measurement scale was intentionally related to the situation in hand, the logical validation was likely to spring automatically from the measuring device. There was enough justification to assume that scales were valid in this respect.

This validity is indicated by the square root of its reliability hence also called the index reliability.

This index of validity has a practical significance, where the measuring device measured a single common factor. The estimates regarding the validity of the measurement scales as obtained by the above formula are given in a table No. 3.6
### TABLE NO. 3.6

**THE RELIABILITY CO-EFFICIENT OF DIFFERENT SCALES USING CRONBACH ALPHA**

| FORMULA Using Cronbach= \( \frac{26r^2}{n-1} \) \( \frac{6t^2}{6-t^2} \) |
|-----------------|-----------------|
| Motivator Factors | co-efficient   | Validity of reliability |
| M1. Feeling of Achievement | .84  | .92  |
| M2. Ability Utilisation | .85  | .92  |
| M3. Recognition and Rewards | .71  | .85  |
| M4. Freedom of Expression | .84  | .92  |
| M5. Scope for professional growth | .91  | .95  |

**HYGIENES FACTORS**

| H1. Behaviour of immediate officer | .78  | .89  |
| H2. Security and Advancement     | .64  | .80  |
| H3(a).Fringe Benefits            | .79  | .89  |
| H3(b).Adequacy of Salary         | .83  | .91  |
| H4. Administrative Set up and Policies of Deptt. at State level. | .84  | .92  |
| H5. Physical Conditions of work  | .80  | .89  |
| H6. Social Status attached to the job | .84  | .90  |

It can be seen (from table 3.5 and 3.6) that measurement scales present a highly satisfactory situation in respect of reliability and validity scores.
reliability and validity scores.

ADMINISTERING THE QUESTIONNAIRE

The primary data has thus been collected through structured questionnaire. It was started in May, 1991 and it took nearly one and a half year to collect the required data.

The teachers were thus contacted with the help of the heads of the institutions. As the questionnaires were distributed personally to all the teachers so before starting to fill those columns, each respondent was informed in detail about the objectives and importance of the project. They were ensured that the information received through the questionnaire would not be used for any type of evaluation by the institution. Their identity in whatsoever form, would not be revealed in the study and the information was only needed for research work. They were even asked not to give their names or any other type of identity on the questionnaire.

Those who showed their inability to return the questionnaire the same day, were allowed maximum one week's time to fill. After that they were again approached to collect the same. Those who had not filled these, were again requested to do so. Two to three attempts were made to contact the non-respondents.

In general, the respondents were co-operative, enthusiastic and interested in filling the questionnaires. Some
difficulties in understanding the language (the specific terms) of the questionnaire were encountered, but little explanation could help in most of the cases.

Regarding availability of the teaching departments in Universities and availability of the professors etc. was at times a hindrance. Convincing the respondents (especially in non-government colleges) about the confidentiality of their responses required some efforts particularly in case of teachers who were not yet confirmed or those who had not completed the two years service.

However, judging from the overall questionnaire recovery of more than 70%, vis-a-vis, the reported low recovery percentage (sometimes as lower 20%) in social sciences literature the response was quite encouraging. The details of the questionnaire received back are shown in Table 3.7.

The details of the questionnaires received back, Districtwise and actually used for the study purpose.
Table 3.7

DETAIL OF QUESTIONNAIRES DISTRIBUTED, RECEIVED AND USED

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Districts</th>
<th>Questionnaires Distributed</th>
<th>Questionnaires Received</th>
<th>Questionnaires actually Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ludhiana</td>
<td>71</td>
<td>57</td>
<td>52</td>
</tr>
<tr>
<td>2.</td>
<td>Jalandhar</td>
<td>68</td>
<td>49</td>
<td>46</td>
</tr>
<tr>
<td>3.</td>
<td>Hoshiarpur</td>
<td>68</td>
<td>50</td>
<td>47</td>
</tr>
<tr>
<td>4.</td>
<td>Sangrur</td>
<td>68</td>
<td>46</td>
<td>42</td>
</tr>
<tr>
<td>5.</td>
<td>Chandigarh</td>
<td>60</td>
<td>37</td>
<td>35</td>
</tr>
<tr>
<td>6.</td>
<td>Punjab University</td>
<td>55</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>7.</td>
<td>Punjabi University</td>
<td>55</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>8.</td>
<td>Guru Nanak Dev</td>
<td>55</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>500</strong></td>
<td><strong>350</strong></td>
<td><strong>320</strong></td>
<td></td>
</tr>
</tbody>
</table>

(xiv) DATA PROCESSING

The mass of data needs to be systematised and organised, before it can serve any worth-while purpose. Following steps have been adopted for data processing; such as, Editing, coding, Scoring and Tabulation.

(a) Editing

The collected data was further checked and edited for its completion and accuracy.

(b) Coding

Data obtained from the respondents are not useable in the exact form in which the same are collected. It was to be
converted to a different form for use.

First of all, the information collected on the questionnaire was given codes to facilitate comparison and sub-classification. A code book has been prepared for this purpose.

(c) Scoring

The data collected by the different tools has been scored. The master table was prepared to know the general profile of the respondents using scoring technique.

The favourable statements rated on a 5 point continuum (depending upon their ticking out) have been scored five to one. Five having gone to the highest (i.e., very much satisfied) and one to the lowest (i.e., very much dissatisfied) and for negative statement (anxiety scale relating to socio-personal characteristics) the order of scoring was reversed, i.e., one to five from the highest to the lowest. For two point continuum (family obligation etc.) of yes-no, the scores allotted were one to zero respectively.

(d) Tabulation

After scoring all the tests, the data have been tabulated for its accuracy, uniformities and completeness. In the process of tabulation, teachers have been classified into different categories.
PROCEDURES OF DATA ANALYSIS

To achieve the objectives, data were statistically analysed. On the basis of the obtained scores on job satisfaction, the subjects were divided into three groups, which were labelled as high, moderately high and very high scores. These three groups were compared with various variables.

These scores were further subjected to statistical analysis using arithmetic mean, standard deviation, coefficient of variations and multiple regression techniques. These tests were applied for getting a clear and concrete picture of job satisfaction level existing in different categories of respondents. Again an attempt was made to study the significance of the difference in the level of job satisfaction between different categories of respondents. Further various attributes used to measure job satisfaction were also compared in order to know their effectiveness in measuring job satisfaction amongst various categories of respondents.

Percentages of respondents were also obtained in each category for each attribute in order to know an overall view of their level of job satisfaction. The frequencies and percentages were calculated for the various socio-personal

8. For detail: see discussion under sub-title, 'Tools and Techniques' used for data analysis.
characteristics of the respondents. The data on overall satisfaction of the teachers were calculated on a five point continuum. The average score of each respondent was obtained by adding the scores of the respective statements and then dividing by total number of statements.

Ranks were also given to the components of job satisfaction according to the mean scores earned by the different sub-groups of the respondents. The job satisfaction of all the sub samples was compared as per their mean of job satisfaction scale. The relationship between job satisfaction and social-personal characteristics and job satisfaction with job factors (motivator-hygiene) were computed through the coefficient of correlation and t-test was applied for testing the significance of the relationship. Interdependence of different variables was also determined using correlation.

The two main groups of University and college teachers were under study. Biographical data collected for these two groups is compared and is tested for significance of difference.

(xvi) Tools and Techniques used for data Analysis

Percentages and mean scores were used for making comparisons and to bring to light the average tendency of the data respectively. Standard Deviation was also drawn.

In this study, Pearsonian co-efficient of correlation and
multiple co-efficient of correlation were used for describing the relationship, between two variables and to determine relationship between the dependent variable (job satisfaction) and independent variables (personal and social characteristics and the job factors) using the following formula.

\[
r(x,y) = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{[N \sum x^2 - (\sum x)^2][N \sum y^2 - (\sum y)^2]}}
\]

Where \( r \) = Co-efficient of correlation
\( N \) = Number of Observations
\( \Sigma \) = Summation
\( x \) and \( y \) = Variables between which relationship is required to be worked out.

Further the 'r' values were tested to know whether the relationship was significant at one or five percent or not. The significance test for 'r' value is as under:

\[
t = \frac{r \sqrt{n-2}}{\sqrt{1-r^2}}
\]

Where \( r \) = value of co-efficient of correlation
\( n \) = Number of observations
\( t \) = Student's 't' test.

The 't' (calculated) value was compared with table 't' value at one and five percent level \((n-2)\) at degree of freedom \((d.f)\)

In this study, It has been intended to find the effect of
30 independent variables on dependent variable separately as well as in combination and multiple regression technique has been used. In order to find out relative contribution of independent variables towards the depended variable, the following equation was fitted. All the independent variables were denoted with symbols $X_1$ to $X_{30}$. The regression equation used for analysis is as under.

$$Y = a + b_1 X_1 + b_2 X_2 + \cdots + b_n X_n$$

Where $Y =$ Dependent variable
$X_1$ to $X_{30} =$ Independent variables
$b =$ Regression co-efficient
$a =$ Constant

Thus the regression equation tells just what role each of the several variables plays in determining the score in $X$, the criterion.

Stepwise Regression

Out of the several types of regression, stepwise regression have been introduced. This was selected as it is considered the most appropriate method for selecting the best group of predictors out of a large number of variables. It is also useful as it provides with the contributory power ($R^2$) of each variable turn by turn to determine their relative importance in the study.
The larger the number of variables, the greater is the possibility that the regression equation will reflect chance relationship: as a result the regression equation will not yield accurate predictions. By reducing the number of variables in the regression equation, likelihood of chance relationships will be reduced. A stepwise regression analysis provides a procedure to simplify the regression equation.

In this method, there are two ways to proceed. One is either to add or to eliminate variables one by one from the regression model. It is conducted either through forward or backward procedure. In forward procedure one may start with the best single predictor and add one variable at a time until the addition of another variable raises the multiple correlation but little. Backward procedure starts with full equation and variables are dropped one by one on the basis of insignificant 'F' value of the variables.9

Forward procedure was selected as it is stated to be more precise and efficient than the backward procedure. On the basis of 30 variables (biographic and job factors), step up procedure of multiple regression analysis have been used for predicting the dependent variable of job satisfaction with the help of following formula:

\[ Y = a + b_1 X_1 + b_2 X_2 + \ldots + b_n X_n \]

Where \( Y = \) Dependent variable \\
\( a = \) Intercept (a constant) \\
\( b_1 \) to \( b_n = \) Regression co-efficients \\
\( X_1 \) to \( X_n = \) Independent variable.

To test the assumption of multi-collinearity, it was tested to know whether the data having the problem and if there existed a problem, then severity of the same and in how many variables it existed. To locate the factors which were multicollinear the multiple correlation coefficients among explanatory variables and in general \( R^2 \) were computed and statistical significance, multiple correlation coefficient were tested.

It was checked just as if the value of two variables (within) are highly correlated, then there can be a problem of multicollinearity. In that case, that variable can be deleted (considering its importance in the study) from the study. The correlation (if it is high nearly 0.80 etc) between two variables indicates the existence of multicollinearity to a particular factor.

Auto Correlation

The data was further subjected to check whether those have the problem of auto correlation. Auto correlation is a special case of correlation. It refers to the relationship not between two (or more) different variables, but between the successive values of the same variable. The interest was to see the auto
correlation of u's. Auto correlation of u's was treated in the same way as correlation in general.

To obtain the existence or absence of auto correlation in the u's and to test the null hypotheses, the Durbin-Watson test was applied in this study. The formula is as follows.

\[ d \approx 2 \cdot (1 - P) \]

Value of D lie between 0 and 4 and that when \( d = 2 \), then \( P = 0 \). It is accepted that there is no auto correlation in the function.

**Significance of a Difference between Multiple R's**

We sometimes want to know whether the multiple R with more independent variables included is significantly greater than the R with a smaller number of variables selected from the original set. There is available an 'F' test for locating such a difference. The formula for computing 'F' for this purpose reads as:

\[
F = \frac{(R_1^2 - R_2^2)}{(m - m_2 - 1)} \cdot \frac{1}{(m_1 - m_2)}
\]

Where \( R_1 \) = Multiple R with large number of independent variables.

\( R_2 \) = Multiple R with one or more variables

\( m_1 \) = Large number of independent variables
\( m_2 = \text{Small number of independent variables} \)

Computations

The multiple correlation and regression analysis (including step wise regression) is so tedious that they can not be used unless the assistance of computer is taken. The computer has made these techniques accessible and practical. Therefore in the present 'study, all the computations have been made with the help of a computer (software). After making all the necessary computations, the results were summarized and interpreted.

Limitations of the Study

The study has been conducted under the following limitations:

1. The study is purely based on the expressed opinion and not on exhibited or enacted opinion of the respondents and these responses were captured with the help of questionnaire, which was prepared for this purpose.

2. Though every possible care was taken to maintain objectivity in getting responses, yet the bias in responses can't be completely ruled out, because in empirical studies, where the questionnaire is used, the subjects often hide and don't express a few things regarding their profession.
3. Only those teachers who had minimum service experience of one year were included in the study. So the respondents have been taken to represent the same of hypothetical population of past, present and future incumbents, related with the teaching profession.

4. As the study is conducted in the Punjab state only and which is an economically better state (per capita income wise) as compared to other states in India; due to these special features, the findings of this study can be generalised to other areas only by exercising due constraints. So the conclusion from this study are applicable at best to the state of Punjab and the country in general.

5. The respondents (teachers) belonged to different faculties and disciplines (whether in universities or in colleges), but the instruments used for determining various aspects were the same for all which may affect the finding of the research.

6. The study could not include teachers of various professional colleges such as medical, engineering, agriculture and from other professional spheres.

7. Due to multiplicity of variables affecting the teacher's job satisfaction, it was difficult to list or make a
The study was limited in its scope in as much as it could only include the concept of the 'level of job satisfaction' of teachers with their socio-personal characteristics and various job factors affecting their job satisfaction. Many other concepts could not be taken just as life satisfaction, job attraction and job performance etc.

The study has the other usual limitation of a single student research project.