METHODOLOGY

Research methodology is a system of explicit rules and procedures upon which research is based and against which claims for knowledge are evaluated.

The purpose of the present study was to compare curricular and co-curricular activities being followed in government and non-government secondary schools in Ludhiana district.

This chapter of the study presents methodology followed for conducting the research under the following sub headings:

- Research design
- Sample and types of sample
- Sample size
- Tool used for the study
- Data collection procedure
- Statistical techniques used in the study

3.1 RESEARCH DESIGN: A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. As such, it is a plan that specifies the sources and types of information relevant to the research problem. For any study, the choice of the method of research is determined by the nature of problem. Historical methods tell much about what existed in the past by determining, evaluating and understanding past events whereas descriptive methods tell about what exists at present by determining the nature and degree of existing conditions.

Descriptive research study is designed to obtain pertinent and precise information concerning the current status of phenomenon and whenever possible to draw valid general conclusions from the facts discovered. In short descriptive research deals with everything that can be counted and studied. This type of research describes what exists and may help to uncover new facts and meaning.

The purpose of descriptive research is to

- observe
describe and
document
aspects of a situation as it naturally occur.

It provides three types of information:

(i) Of what exists with respect to variables or conditions in a situation

(ii) Of what we want by identifying standards or norms with which to compare the present conditions and

(iii) Of how to achieve goals by exploring possible ways and means on the basis of experience of others.

Descriptive research can be either quantitative or qualitative. It can involve collection of quantitative information that can be tabulated along a continuum in numerical form. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts and describes the data collection. This research is the most commonly used and the basic reason for carrying out descriptive research is to identify the cause of something that is happening.

Descriptive studies have an important role in educational research. They have greatly increased our knowledge about what happens in schools. The intent of the descriptive research is to produce statistical information about aspects of education that interests policy makers and educators.

Since descriptive research design is a valid method for researching specific subjects and as a precursor to more quantitative studies and also as the present study has been focused towards these points, so descriptive survey was the design of the present study to explain the curricular and co-curricular activities in government and non-government secondary schools in the urban and rural area of Ludhiana district.

3.2 SAMPLE: A sample is a finite part of a statistical population whose properties are studied to gain information about the whole. Sampling is the act, process or technique of selecting a suitable sample or a representative part of a population for the purpose of determining
parameters or characteristics of the whole population. A sample is expected to mirror the population from which it comes; however, there is no guarantee that any sample will be precisely representative of the population from which it comes. Chance may dictate that a disproportionate number of untypical observations will be made.

3.2.1 Types of Sample: There are three primary types of sample: the convenience, the judgement sample and the random sample. These samples differ in the manner in which the elementary units are chosen.

The convenient sample: A convenience sample results when the more convenient elementary units are chosen from the population for observation.

The judgement sample: A judgement sample is obtained according to the discretion of someone who is familiar with the relevant characteristics of the population.

The random sample: This may be the most important type of sample. A random sample allows a known probability that each elementary unit will be chosen. It is sometimes also referred to as a probability sample. A simple random sample is obtained by choosing elementary units in such a way that each unit in the population has an equal chance of being selected. A simple random sample is free from sampling bias.

3.2.2 Sample Size: Before deciding how large a sample should be, one has to define the study population. Then we have to determine the sampling frame by listing all the units. Sample size depends on various constraints like the available funding, time and manpower. These constraints influence the sample size as well as sample design and data collection procedures. In general, sample size depends on the nature of the analysis to be performed, the desired precision of the estimates one wishes to achieve, the kind and number of comparisons that will be made, the number of variables that have to be examined simultaneously and how heterogeneous the universe is. In non-experimental research, most often, relevant variables have to be controlled statistically because groups differ by factors other than chance.

The present study was carried out in Ludhiana district in the state of Punjab. All the government and non-government secondary schools of Ludhiana district were identified from the list which was procured from District Education Office, Ludhiana. (Appendix 1)
A sample of 200 schools comprising 100 government and 100 non-government secondary schools of Ludhiana district was taken. To have heterogeneous sample, 50 government schools were taken from urban area and 50 from rural area. Similarly, for the non-government schools 50 each were taken from urban and rural area. The schools were randomly selected from the list taken from District Education Office, Ludhiana.

3.3 TOOL OF STUDY: Instruments used to obtain data in descriptive studies include

- Questionnaires
- Interviews
- Observations

For any research, development of questionnaire is an important step as it decides the study outcome. For collecting new unknown data required for the study of any problem, one may use various devices. The instrument thus employed for this purpose is called tool (Questionnaire). A questionnaire is a research tool through which respondents are asked to respond to similar set of questions in a predetermined order (Gray, 2004). A questionnaire is relatively economical, has standardized questions, can ensure anonymity and questions can be written for specific purpose (McMillan & Schumacher, 1993). These may be used as the sole instrument for the collection of
study data, such as in a cross-sectional design or in combination with other instruments of data collection.

3.3.1 Development of Tool: Keeping in view the variables and looking into the applicability and suitability, first of all, the investigator searched the existing literature. Considering the nature, topic and scope of the study, however, none of the tool was found suitable for the present study, therefore, the need was felt by the investigator to develop her own tool to collect the required data from the head of the schools pertaining to curricular and co-curricular activities being followed in their schools.

3.3.2 Preparation of Tool: Before going onto the process of construction of information proforma, the investigator studied thoroughly some related work in the Ph.D. theses, M.Ed. dissertations, journals, books, educational surveys and also the work done and published by NCERT, SSA and NEUPA. In addition to this, thorough discussion with her supervisor, principals and subject teachers of secondary and senior secondary schools, principals and faculty of colleges of education who have done Ph.D. were also consulted for the construction of proforma. The District Education Officer, Deputy District Education Officer, District Science Supervisor, Principal and faculty of Government In-service Teacher Training Centre of the district Ludhiana were also contacted for the development of questionnaire. On the basis of this whole exercise, the investigator prepared a questionnaire at the initial stage for the collection of information regarding curricular and co-curricular activities being followed in schools. Further in order to improve the quality, style and language of the proforma, the investigator consulted the research work done by other researchers.

3.3.3 Validation of Tool: Initial draft of tool consisted of statements to get information regarding guidance service in school, audio-visual aids used in school, instructional material and different co-curricular activities. This draft comprising of statements concerning different components was got typed and got validated from experts. The copies were handed over to ten experts in the field of education and having good background of research. These experts were senior/retired faculty of educational colleges and research supervisors. These experts were requested to read proforma (tool) carefully in respect of language and vagueness in statements. They were also requested to check that proforma was fairly representative of most of the aspects of curricular and co-curricular activities being followed in schools.
On the basis of the judgements, opinions and suggestions of experts, few statements were clubbed together, few statements were deleted and few were added. After incorporating the modifications, reorganizing the statements and reshaping their language, a final version of the questionnaire was prepared.

3.3.4 Finalization of Tool: Next step in process of methodology was to try out this questionnaire on the heads of the secondary and senior secondary schools. For this purpose, copy of proforma (tool) was given to each of twenty heads of secondary and senior secondary schools - 10 government and 10 non government schools; 5 each from urban and rural area. These heads were made aware regarding the purpose of the study. They were also assured that the information provided by them will be kept confidential and will only be used for research purpose of the present study. Since no problem was encountered for the collection of related data on this proforma so it was assumed to be final.

3.3.5 Description of Tool: The tool/questionnaire (Appendix II) consisted of the following components:

Part 1: General information about the school

Part 2: Information pertaining to curricular activities being followed in school

Part 3: Information pertaining to co-curricular activities being followed in school

Part 1: In this part, information pertaining to general aspects of the school was collected. It contains name and address of school, location of school, level of school. Besides this general information some quantitative data of the school viz., number of students in class ninth, tenth, eleventh and twelfth, number of teachers teaching classes IX and X, XI and XII, category of school, covered area, playground area, type of board, streams taught in school and result of class X and class XII for the previous one year was also obtained.

Part 2: In this part information about various curricular activities being followed in the school were recorded. It contains information about three dimensions of curricular activities:

(i) Guidance/student support programme comprising of guidance services (16 items) and guidance service provider in school (8 items).
(ii) Instructional programme comprising of methods of teaching (7 items), media used for instruction (5 items), different types of facilities in school (10 items), extra coaching/classes (3 items), library and other allied facilities (11 items), practical periods of different subjects in time table (6 items), maintenance and checking of diary (4 items), school publications (7 items), visual aids (8 items), audio and audio visual aids (6 items).

(iii) Examination and evaluation consisting of test system in school (5 items), provision of additional subject (2 items), system of evaluation followed in school (7 items), system of cumulative progress report (7 items), system of internal assessment (7 items), basis of internal assessment (4 items) and provision of compartment in non board class (1 item).

Each item was to be responded in binary form: ‘Yes’ or ‘No’. If ‘Yes the activity was being held; and if ‘No,’ the activity was not being held.

**Part 3:** In this part information about ten dimensions of co-curricular activities which are being followed in the schools were noted. It contains information about

(i) Literary activities (15 items)
(ii) Aesthetic and cultural activities (15 items)
(iii) Activities of leisure (hobbies) (10 items)
(iv) Craft activities (16 items)
(v) Excursion activities (11 items)
(vi) Civic development activities (5 items)
(vii) Social welfare activities (12 items)
(viii) Miscellaneous co-curricular activities (4 items)
(ix) Health education programme (9 items)
(x) Infrastructure and facilities of physical education (11 items).

Each item was to be responded in binary form: ‘Yes’ or ‘No’. If Yes, the activity was being held, and if No, the activity was not being held.

**3.4 PROCEDURE FOR COLLECTION OF DATA:** Data collection is a term used to describe a process of preparing and collecting data. The purpose of data collection is to obtain information to keep
on record, to make decisions about important issues and to pass information to others. Primarily, data is collected to provide information regarding a specific topic.

Prior to any data collection, pre-collection activity is one of the most crucial steps in the process. In this regard, the investigator visited the school to seek the prior consent of the head of the school and thereafter; the investigator visited the school on the pre-fixed date and time. However, due to any emergent situations, if a holiday was declared or the investigator could not visit the school on the pre-fixed date and time, the investigator again sought appointment for the visit. The investigator contacted the head of the school and relevant information pertaining to curricular and co-curricular activities followed in the sessions 2006-2007 and 2007-2008 was collected on the self-designed questionnaire. In this way, the data was collected for two hundred schools as per the sample description of the present study. The period of data collection was from September, 2009 to October, 2010.

The analysis of data covered making master chart by coding the observation collected and statistical analysis.

In this study, each visited school was assigned a serial number. Each item on the questionnaire was assigned a column number. The serial number for each school was captured first, followed by the column of each item. Responses for each item were also assigned codes: Yes-1 and No-2. The codes for each item were entered against each column number. The data was validated to ensure that entering was done accurately.

3.5 STATISTICAL TECHNIQUES: Statistical Analysis is an important step and contributes significant weightage of the entire Ph.D. dissertation. As already stated, the data pertaining to government and non government secondary schools with respect to curricular and co-curricular activities were collected on various activities. The data so collected were tabulated and analyzed by using various statistical techniques. One way frequency tables were prepared for each and every questionnaire item as an initial step in the exploratory analysis. Graphs and diagrams were prepared to elicit the data. Mean and standard deviation of the quantitative variables were computed. The analysis of data was done by using Chi square test and Analysis of Variance (ANOVA) technique.
Description of Statistical Formulae and tests used in the present study is given below:

**Mean:** The mean describes the central location of the data. For a data set, the mean is the sum of the values divided by the number of values.

The mean of a set of numbers $X_1, X_2, \ldots, X_n$ denoted by $\bar{X}$ was calculated by using the formula

$$\bar{X} = \frac{\sum X}{N}$$

**Standard Deviation** is a widely used measurement of variability in statistics. It shows how much variation or “dispersion” there is from the average (mean). A low standard deviation indicates that the data points tend to be very close to the mean whereas high standard deviation indicates that the data are spread out over a large range of values.

$$S = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

where $S$ = the standard deviation of a sample,
$\Sigma$ means “sum of,”
$X$ = each value in the data set,
$\bar{X}$ = mean of all values in the data set,
$N$ = number of values in the data set.

**Chi Square Test:** Since the data from this study was categorical, Chi Square test was used. This test is used to assess two types of comparison: tests of goodness of fit and tests of independence.

The chi-square statistics is calculated by finding the difference between each observed and theoretical frequency for each possible outcome, squaring them, dividing each by the theoretical frequency and taking the sum of the results. Yates correction was applied when the cell frequency was less than five.

The value of the test-statistic is calculated by using the formula:

$$X^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

Where

$O_i$ = an observed frequency;
\[ E_i = \text{an expected (theoretical) frequency, asserted by the null hypothesis;} \]
\[ n = \text{the number of cells in the table.} \]

A second important part of determining the test statistic is to define the degrees of freedom of the test: this is essentially the number of observed frequencies adjusted for the effect of using some of those observations to define the theoretical frequencies. The degrees of freedom for a \( r \times c \) table is equal to \((r - 1)(c - 1)\).

**Analysis of Variance (ANOVA):** In statistics analysis of variance (ANOVA) is a collection of statistical models and their associated procedures, in which the observed variance in a particular variable is partitioned into components attributable to different sources of variation. In its simplest form ANOVA provides a statistical test of whether or not the means of several groups are all equal. One-way analysis of variance (abbreviated one-way ANOVA) is a technique used to compare means of two or more samples (using the F Test).

The summarized table of one way ANOVA is given below:

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between variation</td>
<td>k-1</td>
<td>SSB</td>
<td>MSB/k-1</td>
<td>MSB/MSW</td>
</tr>
<tr>
<td>Within variation</td>
<td>n-k</td>
<td>SSW</td>
<td>MSW/n-k</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>n-1</td>
<td>SST</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

**Statistical Software used:** All the analysis was done by using statistical package SPSS version 11.5.

**Level of Significance:** The level of significance was taken as 5%. All values of \( p \) which was less than or equal to 0.05 was taken as significant.