# CHAPTER-3

## METHODOLOGY

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CHAPTER-3

METHODOLOGY

Research is composed of two words ‘re’ and ‘search’ which means to search again or a careful investigation to re-understand or re-examine the facts or to modify older ones in any branch of knowledge. It is studious inquiry or critical-examination and exhaustive investigation or experimentation which aims at the discovery of new facts and their correct interpretation (Verma & Verma, 1989). A research is considered to be a formal and systematic effort and intensive process in the direction of solution of the problem. Thus, research is a systematic method of operating certain variables under controlled conditions.

Methodology of research includes the plans, techniques and strategies to be followed in carrying out a research study, i.e., selecting appropriate research design, identifying and defining the nature of the population, techniques used to select a representative sample from that population, tools used for the required data and statistical techniques used in the data analysis. These steps require immense care as they are of great significance in carrying out the task of research process in a smooth and successful manner. Hillway (1964) stated that “to describe in detail the specific method being used, incidentally, constitutes a very good way of determining whether the method chosen has been worked out properly and it likely to prove effective. If the scholar cannot describe the method, the chances are that it is too vague and general to yield satisfactory results.”

3.1) Research Design

As an architect prepares a blue print before he approves a construction, an artist makes a design before he executes his ideas, any prudent man makes a plan before he undertakes work; similarly, an investigator makes a plan of his study before he undertakes any work. This enables the investigator to save a great deal of time and resources. Such a plan of study or blue print for study is called a research design. Research design is the plan, structure, and strategy of investigation conceived so as to obtain answers to research questions and to control variance (Kerlinger, 2009a). In fact it is the blue print of the detailed procedures of testing the hypotheses and analysing the obtained data. The research design helps the researcher in testing the
hypotheses by reaching valid and objective conclusions regarding the relationship between the dependent and independent variables. Basically research design serves two functions, firstly, it enables the researcher to answer research questions as validly, objectively, accurately and economically as possible. Secondly, a research design also acts as a control mechanism. It enables the researcher to control unwanted variance. In the words of Ram Ahuja (2011) research design is “planning a strategy of conducting research”.

The main thrust of the present research work is concerned with analysis and description of principals’ effectiveness. This is a study of relationship of principals’ effectiveness with independent variables like, job satisfaction, work commitment, emotional maturity and hardiness and to study the impact of job satisfaction, work commitment, emotional maturity, hardiness and some demographic variables like age, gender and length of experience on principals’ effectiveness. The present research study follows survey method and this study is also a correlation study in which it seeks to empirically study correlation between variables selected for the study such a study falls under descriptive survey method of research. Descriptive studies deals with the finding at “what is” and the causal-comparative method “is aimed at the discovery of possible causes for the phenomena being studied by comparing subjects in whom a characteristic is present with similar subjects in whom it is absent or present to a lesser degree” (Borg & Gall, 1989). Descriptive research also referred to as survey method (Gay & Airasian, 2000) is mainly concerned with “attitudes, opinions, preferences, demographics, practices and procedures.” According to Gay and Airasian (2000) “descriptive data are usually collected by questionnaire, interview, telephone, or observation.”

In the present study quantitative research methods are utilised to test the proposed hypotheses. The questionnaire technique was employed to collect the data from the principals as well as teachers of CBSE affiliated secondary schools.

Therefore, in the present research study ‘Descriptive Survey Design’ is used. This method is concerned with surveying, describing and investigating the existing phenomenon or issues, conditions and relationships that exist. The present research
work aims at studying the principals’ effectiveness in relation to job satisfaction, work commitment, emotional maturity and hardiness.

3.2) Variables in the Present Study

A variable is something which varies. It is a symbol to which we assign numeral values. An independent variable is the presumed cause of the dependent variable, the presumed effect. The independent variable is the antecedent: dependent is the consequent (Kerlinger, 2009b). A variable is something that can be changed, such as a characteristic or value. The dependent variable is the variable that is measured by the investigator. The independent variable is the variable that is controlled and manipulated by the investigator. In simple words, in a study the independent variable is the variable that is varied or manipulated by the investigator, and the dependent variable is the response that is measured. An independent variable is the presumed cause, whereas the dependent variable is the presumed effect. The independent variable is the antecedent, whereas the dependent variable is the consequent.

The variables used in the study have been described below:

3.2.1) Dependent Variable

It is the outcome which is expected to arise from some treatment. Such variables are dependent in the sense that they depend on the treatment. For example, if the treatment has one effect, the dependent variable may have a low value; whereas if the treatment had a different effect the dependent variable may have a high value. Since the investigator intends to find out the impact of job satisfaction, work commitment, emotional maturity and hardiness on the effectiveness of school principals. Principals’ effectiveness is the dependent variable in the present study.

3.2.2) Independent Variables

It is the treatment that is expected to produce an outcome. Independent variable and treatment are used simultaneously. Independent variable is independent in the sense that it does not depend on the outcome (dependent) variable. The treatment given thus, job satisfaction, work commitment, emotional maturity and hardiness are independent variables in the present study and some demographic variables like age,
gender and length of experience are also included to see their impact on principals’ effectiveness.

3.3) Population

Best and Kahn (2011a) defined a population as “Any group of individuals that has one or more characteristics in common and that are of interest to the researcher.” According to Singh (2009) “The well-specified and identifiable group is known as a population.” A population may be finite or infinite. A finite population is one in which all the members can be easily counted. An infinite population is one whose size is unlimited and therefore, its members cannot be counted. A population is to be properly defined so that there is no ambiguity as to whether a given unit belongs to the population. If a population is not properly defined, an investigator does not know what units to consider when selecting the sample. Secondary school principals and teachers from the Districts Aligarh and Ghaziabad of Uttar Pradesh (UP) and principals and teachers from New Delhi constituted the target population in the present study.

3.4) Sample

Sample refers to a small representative proportion of population selected for observation and analysis. “A sample is a subgroup of population.”(McCall, 1980). Wiersma (2000) defines sample as “A subset of the population to which the researcher intends to generalise the results.” By observing the characteristics of the sample, one can make certain inferences about the characteristics of the sample; one can make certain inferences about the characteristics of the population from which it was drawn (Best & Kahn, 2011b). Samples are not selected haphazardly rather they are chosen in a systematic way according to some rule or plan so that they are representative of the population. Sampling is the process by which a relatively small number of individuals or measures of individuals, objects, or events is selected and analysed in order to find out something about the population from which it was selected. It helps to reduce expenditure, save time and energy. Sampling procedures provides generalisations on the basis of a relatively small proportion of the population (Kothari 2007a). The purposive sampling technique was employed by the investigator with a purpose to select a sample of the principals and the teachers were selected
randomly, at secondary school level of Districts Aligarh and Ghaziabad of Uttar Pradesh (UP) and New Delhi. The purposive sampling technique has one major advantage it is convenient for the investigator. This technique, as expected, proved to be quick, and inexpensive. The power of purposive sampling lies in selecting information-rich subjects (Patton, 2002; Cohen, et al., 2000). According to Creswell (2005) in this technique the investigator chooses particular persons due to their availability, willingness and convenience to be studied. The investigator selected a sample of 2500 school teachers and 500 school principals and it is assumed that it is sufficiently large to generalise characteristics of effective and ineffective principals.

3.4.1) Data Needed for the Study

The hypotheses sought to be tested and the objectives to be fulfilled required the following data recording:

1) Teachers’ evaluation of school principals.
2) Job satisfaction of school principals.
3) Work commitment of school principals.
4) Emotional maturity school principals.
5) Hardiness of school principals.
6) Age of school principals
7) Gender of school principals
8) Length of experience of school principals.

3.4.2) Method of Data Recording

The data recorded was categorised into two samples, one indicating the principals’ effectiveness as shown by the teachers and the other indicating the principals’ job satisfaction, work commitment, emotional maturity and hardiness as shown by the principals’ themselves.

For the first sample, an average score was calculated from the five scores obtained on the scale, “Principal Effectiveness Scale”, as given by five randomly selected teachers of each school. This score contributed to the principal effectiveness of each school. The second sample giving scores of job satisfaction, work commitment, emotional maturity and hardiness of principals were tabulated against the average scores of
principal effectiveness respectively. The High Effective Group of Principal (HEGP) and Low Effective Group of Principal (LEGP) were drawn by employing extreme group technique of 27% above and below. As such from the principals’ effectiveness score arranged in increasing order, the above 27% i.e., 135 school principals possessing high scores were identified as High Effective Group of Principals (HEGP) and below 27% i.e., 135 school principals were identified as Low Effective Group of Principals (LEGP). Extreme Group Technique (EGT) is also used by several other researchers to draw the effective and ineffective educational administrators (Mudasir, 2013; Bhat & Puju, 2012; Mudasir, 2012).

### Table No.3.1
Sample of Schools

<table>
<thead>
<tr>
<th>Place</th>
<th>Number of Schools Surveyed</th>
<th>Number of Schools Failing in Response</th>
<th>Number of Schools Giving Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligarh</td>
<td>60</td>
<td>9</td>
<td>51</td>
</tr>
<tr>
<td>Ghaziabad</td>
<td>216</td>
<td>38</td>
<td>180</td>
</tr>
<tr>
<td>New Delhi</td>
<td>324</td>
<td>53</td>
<td>269</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>600</strong></td>
<td><strong>100</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

#### 3.4.3) Sample of Teachers

The questionnaire, type I entitled, “Principal Effectiveness Scale”, was given to five randomly selected teachers of each of the selected school. These teachers evaluated their principal on the scale provided to them. Those teachers who were having an experience of two to seven years were given the questionnaire. Thus, the total number of teachers consulted amounted to two thousand five hundred (2500).

#### 3.4.4) Sample of Principals

Questionnaire, type II was given to the school principals about whom the teachers had given their opinion about the effectiveness of principals. This questionnaire consisted of five parts measuring job satisfaction, work commitment, emotional maturity and hardiness of the principals and personal data sheet for the school principal regarding their age, gender and length of experience.
Table No. 3.2
Initial Sample of Subjects

<table>
<thead>
<tr>
<th>Number of Teachers Consulted</th>
<th>Number of Teachers Failing in Response</th>
<th>Number of Principals Consulted</th>
<th>Number of Principals Failing in Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>500</td>
<td>600</td>
<td>100</td>
</tr>
</tbody>
</table>

3.4.5) Subjects Dropped

Since the investigator proposes to study the effect of job satisfaction, work commitment, emotional maturity and hardiness on the principal’s effectiveness, therefore, data had to be collected from both the principals as well as the teachers corresponding to each school. Thus a teacher from a school failing in response would lead to the elimination of the response given by the principal of that school. Similarly, in case the principal failed to give a response, the response given by the teachers of that school had to be eliminated. In addition, even if two teachers of a school failed to give a response, the data received from that school was of no use, because the investigator required response from at least five teachers of each school. Thus the data succumbed to a lower value as shown below:

Table No. 3.3
Final Sample of the Study

<table>
<thead>
<tr>
<th>Number of Teachers</th>
<th>Number of Principals</th>
<th>Number of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

Distribution of these 500 school principals rated by their respective 2500 teachers with respect to demographic variables is shown in Figure 3.1
3.5) Research Tools Used

The meaningfulness of results and the dependability of research findings depend not only on method and procedure, data analysis or results interpretation, but also on the appropriateness of the tools and measures employed in the study. In a research study, while selecting research tools many considerations have to be kept in mind such as availability of suitable tests, the amount of time to be devoted for the study, and the objectives of the study. Tools should be appropriate, reliable and valid as well as suitable for the research. For measuring the principals’ effectiveness in the present study, the investigator went through different standardised tools. Therefore, for the purpose of the data collection, the following standardised tools were used.

1) Principal Effectiveness Scale developed by Dr. Shaheen Usmani in 1988, Verification of Reliability and Validity was done by the investigator in 2010.
2) Job Satisfaction Scale developed by Dr. Amar Singh and Dr. T. R. Sharma (2009)
3) Work Commitment Scale developed by Dr. Imtiaz Nasheed (2000)
4) Emotional Maturity Scale developed by Dr. Yashvir Singh and Mahesh Bhargava (2010)
5) Singh Psychological Hardiness Scale developed by Dr. Arun Kumar Singh (2008)
6) Personal Data Sheet for School Principal developed by investigator himself (2010)

The detailed descriptions of the above mentioned research tools are given below:

**TYPE I- QUESTIONNAIRE FOR TEACHERS**

### 3.5.1) Principal Effectiveness Scale (PES)

The major activities of the principals have been termed as the “Dimensions” on which the principal has to work. The “Dimensions” are six in numbers. They are as follows:

![Figure 3.2: Dimensions of Principal Effectiveness Scale](image)

**D-1 Personal Qualities**

To justify his place as the inspiring leader and guide, the principal must have certain strong personal qualities. Hundreds and thousands of eyes watch him, judge him, measure him and are eager to follow his noble example. Thus, he has to be impressive, physically fit, sweet and soft as well as stiff and stern. Unless he has a seeing eye, an understanding heart and all adjusting mental poise, he is bound to falter and tumble. He should be firm in his dealings, resolute in his conviction and decisions and relentless in execution.
D-2 Professional Qualities

For a principal to be effective it is undoubtedly important that he should be well equipped, academically and professionally. He must familiarise himself with the methods of teaching different subjects. Through the study of educational journals and periodicals and latest literature, he should keep himself well posted regarding the latest developments in the field of education. He must read a lot and travel a lot. A broad base in general education is calculated to help him become a liberally educated person-one who has explored and has a feeling of variety of subject areas, one who has the bases for understanding and communicating with other persons of diverse backgrounds in the school and the community. The general education should provide him with sound communication skills, the basic tools of his work.

D-3 Association with School Staff

The close cooperation of the principal and the staff depends on the efficiency of the school and it is the head of the institution who is to a great extent responsible for securing cooperation of the teachers. Thus, there must be high morale, accurate information and a good professional spirit among the staff members. A staff that is continuously complaining about being abused, unappreciated, and over worked and under paid and is bored with teaching will never breed good public relations and improve teaching conditions. Staff morale is not something that can be attained solely by good salaries or by plea or dictation. It can be cultivated and developed when the principal becomes personally acquainted with class room teachers and other school personnel, and makes himself easily available to teachers, withholds judgment. Moreover, he must refrain from blaming the teachers while discussing or investigating the problems of relationships, and above all he must recognise, respect and utilise the opinion of all persons with whom he works.

D-4 Association with Higher Authorities, Community and Parents

For the betterment of the school the principal should keep the managing committee of the school well informed as to what is going on in the schools and to discuss problems and plans with them in detail. He should make a special effort to discuss with members of managing committee contemplated changes in the instructional
programmes and reasons for them. As carefully as he considers his school and its readiness for using human resources the principal will likewise take stock of his community. Good efficient principals will find enough time to read enough professional material to know “who is who” and “what is what” in the educational world. He will keep in touch with state and national resources and will see that good professional help is obtained when needed through human and material resources, and that such help is judiciously used. A contact of the principal with parents has been widely accepted and appreciated. Educators are now fast realising that effective and intimate relations with parents are very necessary for the efficient organisation of school work and activities. Happy and healthy contacts with students, parents and guardians help in knowing the child better psychologically as well as physically. Children problems can be more easily solved with the knowledge of their background.

D-5 Supervisory Competence

The role of the principal in the supervision of the school cannot be ignored. He is essentially recognised as the educational leader of his school, responsible for the supervision of instruction as well as for the execution of other administrative functions. Days of autocracy are over, and a democratic supervision demands respect for personality. It makes ample provision for self direction on the part of teachers and their participation in-service growth. Modern supervision strives to utilise the talents and strength of all. The emerging concept of democratic leadership recognises the necessity of realising and using the potential which resides within various members of the group.

D-6 Leadership Competence

In a way to define a principal, we say that he is the leader of the school who holds the reigns and leads the school to success or disaster. But what is leadership? According to Good (1973)’s Dictionary of Education, it is “The ability and readiness to inspire, guide, direct or manage others.” The principal has to continuously and sincerely strive to attain the qualities of true leadership. He will understand and put into practice sensible fair rules of good human relations. He must be ever alert for ways to break down barriers of fear and uncertainty and build up feelings of security which peoples must have if they are expected to bring their problems out in the open. The success of
any programme of instructional improvement depends not only on the content but also on the process through which it is initiated and carried on. A wise principal will at times be the obvious leader in the situation at hand, at other times he may be just a consultant. At all times he will reveal a sincere spirit of interest in and appreciation for the efforts and accomplishments of all involved. The portrait of the principal as a leader emerges from the facts that the principal has to pattern and guide the outcomes of cooperative action, communicate through school personnel in order to generate a sense of mutual understanding and mutual loyalty demanded by the ideals of education, and resolve differences which frequently arise in a growing organisation.

The Principal Effectiveness Scale (PES) consisted of 60 items. Dimensions wise detail is given below:

**Table No. 3.4**

Dimensions of Principal Effectiveness Scale (PES)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimensions</th>
<th>No. of positive items</th>
<th>No. of negative items</th>
<th>Total No. of items.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>D-1</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>D-2</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>D-3</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>D-4</td>
<td>6</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>D-5</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>6.</td>
<td>D-6</td>
<td>14</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>39</td>
<td>21</td>
<td>60</td>
</tr>
</tbody>
</table>

**Reliability of PES**

Reliability of the principal effectiveness scale was 0.826 in 1988 as calculated by Dr. Shaheen Usmani. Since the scale was old. Therefore, verification of Reliability and Validity for the present research was again done by the investigator in 2010. In this way reliability was calculated on 104 subjects and Cronbach’s Alpha reliability was 0.728. It was found reliable for the present study. (Refer appendix G).

**Validity of PES**

Item analysis of the items itself indicates item validity still content validity is claimed on the basis of the fact that items were accumulated as a result of a thorough
investigation of the literature on school principal effectiveness in specific areas. These items were further reviewed and evaluated by a number of experts who are in close acquaintances with the principal or his job. In order to check the validity of the tool principal effectiveness scale for the present study, the investigator found construct validity by testing the relation between score of each item with total degree of the scale. Therefore, it was found valid for the present study. (Refer appendix H).

**Scoring of PES**

The scheme of scoring response categories involved differential weighting such that the response category, strongly agree was given a weight of 4, ‘agree’ a weight of 3, ‘undecided’ a weight of 2, and ‘disagree’ a weight of 1, and ‘strongly disagree’ a weight of 0, in respect of responses pertaining to positive statements. The scoring was reversed for the statements that were negative.

**Type II- Questionnaire for School Principals**

This questionnaire consists of a battery of tests each constituting the five parts. The five tests are as follows:

1) Job Satisfaction Scale - Part I
2) Work Commitment Scale - Part II
3) Emotional Maturity Scale - Part III
4) Singh Psychological Hardiness Scale - Part IV
5) Personal Data Sheet for School Principal- Part V

**3.5.2) Job Satisfaction Scale (JSS) - Part I**

For measuring the level of job satisfaction of school principals, Job Satisfaction Scale (2009) developed by Dr. Amar Singh and Dr. T.R. Sharma was employed. JSS consists of 30 statements which are categorised as:

1 Job - Intrinsic statements (factors inherent in the job)
   a) Job concrete statements such as excursions, place of posting, working conditions:
      6, 11, 13, 19, 23, and 25
   b) Job abstracts statements such as cooperation, democratic functioning etc.
8, 15, 16, 17, 20, 21, and 27

2. Job – Extrinsic statements (factors residing outside the job)
   a) Psycho-social such as intelligence, social circle:
      1, 3, 4, 7, 10, 12, 26, and 30
   b) Economic such as salary, allowance:
      2, 5, 9, 18
   c) Community/National growth such as quality of life, national economy:
      14, 22, 24, 28, and 29

Reliability and Validity of JSS

The test-retest reliability works out to be 0.978 with N= 52 and a gap of 25 days. The scale compares favourably with Muthayya’s job satisfaction questionnaire giving a validity coefficient of 0.743.

Scoring of JSS

The scale has both positive and negative statements, each having five alternatives from which a respondent has to choose any one which candidly expresses his response. Items at Sr. No. 4, 13, 20, 21, 27 and 28 are negative, others are all positive. The positive statements carry a weightage of 4, 3, 2, 1 and 0 and the negative ones a weightage of 0, 1, 2, 3 and 4. The total score gives a quick measure of satisfaction/dissatisfaction of a worker towards his job.

The table No. 3.5 shows the degree of satisfaction:

<table>
<thead>
<tr>
<th>Score</th>
<th>Degree of Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>74 or above</td>
<td>Extremely satisfied</td>
</tr>
<tr>
<td>63-73</td>
<td>Very satisfied</td>
</tr>
<tr>
<td>56-62</td>
<td>Moderately satisfied</td>
</tr>
<tr>
<td>48-55</td>
<td>Not satisfied</td>
</tr>
<tr>
<td>47 or below</td>
<td>Extremely dissatisfied</td>
</tr>
</tbody>
</table>

3.5.3) Work Commitment Scale (WCS) - Part II

To understand and measure level of principals’ work commitment, a scale developed and standardised by Dr. Imtiaz Nasheed (2000) was used. WCS is based on three
dimensions proposed by Meyer and Allen (1991) viz., (i) affective commitment which involves employee’s emotional attachment to identification and involvement with organisation, (ii) continuance commitment which refers to commitment based on cost that employees associate with leaving the organisation, and (iii) normative commitment that refers to employee’s feeling of obligation to stay with the organisation.

Reliability and Validity of WCS

Split-half reliability was $r = 0.80$ and validity coefficient $r = 0.76$ are quite high, hence scale is said to be highly reliable and valid.

Scoring of WCS

WCS scale consisted of 15 items on the pattern of a Likert type scale having 7-point response category ranging from ‘1’ strongly disagree to ‘7’ strongly agree response categories. Higher score indicate committed worker and lower indicated the not committed workers.

3.5.4) Emotional Maturity Scale (EMS) - Part III

For having an idea about the levels of emotional maturity of school principals, Emotional Maturity Scale (2010) developed by Yashvir Singh and Mahesh Bhargava was used. EMS has a total of 48 items. EMS is based on five broad factors of emotional maturity under the five categories given in table. No. 3.6 below:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Areas</th>
<th>Total No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Emotional Stability</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>Emotional Progression</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>Social Adjustment</td>
<td>10</td>
</tr>
<tr>
<td>D</td>
<td>Personality Integration</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>Independence (State of being competent)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
</tr>
</tbody>
</table>
Reliability

The reliability of the test was determined by: (i) test-retest method, and (ii) internal consistency.

**Test-retest reliability**- The test was measured for its test-retest reliability by administering upon a sample of 150 subjects. The time interval between two testings was that of six months. The product moment r between the two testing was 0.75.

**Internal consistency**- The internal consistency of the scale was checked by calculating the coefficient of correlations between total scores and scores on each of the five areas. Table No.3.7, given below, shows the values of internal consistency.

<table>
<thead>
<tr>
<th>Table No.3.7</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Areas</th>
<th>r value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Emotional Stability</td>
<td>0.75</td>
</tr>
<tr>
<td>b</td>
<td>Emotional Progression</td>
<td>0.63</td>
</tr>
<tr>
<td>c</td>
<td>Social Adjustment</td>
<td>0.58</td>
</tr>
<tr>
<td>d</td>
<td>Personality Integration</td>
<td>0.86</td>
</tr>
<tr>
<td>e</td>
<td>Independence</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Validity

The scale was validated against external criteria, i.e., the (d) area of the adjustment inventory by Sinha and Singh. The inventory has (d) area for measuring emotional adjustment. The number of items of this area is 21. Product moment correlation obtained between total scores on all 21 (d) items and total scores on EMS was .64 (N = 46).

**Scoring of EMS**

Emotional maturity scale has a total of 48 items under the five categories. EMS is a self-reporting five point scale. Items of the scale are in question form demanding information for each in either of the five options viz. ‘very much’, ‘much’, ‘undecided’, ‘probably’, ‘never’. The items are so stated that if the answer is very much a score of ‘5’; is given; for much ‘4’; for undecided ‘3’; for probably ‘2’; and for negative answer never, a score of ‘1’ is to be awarded. All the statements are
negatively worded, therefore the higher the score on the scale, greater the degree of emotional immaturity and vice-versa.

Table No. 3.8
Interpretation of Scores of EMS

<table>
<thead>
<tr>
<th>Scores</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-80</td>
<td>Extremely stable</td>
</tr>
<tr>
<td>81-88</td>
<td>Moderately stable</td>
</tr>
<tr>
<td>89-106</td>
<td>Unstable</td>
</tr>
<tr>
<td>107-240</td>
<td>Extremely unstable</td>
</tr>
</tbody>
</table>

3.5.5) Singh Psychological Hardiness Scale (SPHS) - Part IV

For measuring the hardiness level of the principals the investigator used Singh Psychological Hardiness Scale (SPHS). The SPHS has been prepared and standardized by Arun Kumar Singh (2008) in Indian situation. SPHS consisted of 30 items. Table No. 3.9 gives component wise detail of SPHS.

Table No. 3.9
Component Wise Detail of SPHS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Hardiness Component</th>
<th>Item No. Serial wise</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Commitment</td>
<td>1, 4, 7, 10, 13, 16, 19, 23, 25, 28</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Control</td>
<td>2, 5, 8, 11, 14, 17, 20, 23, 26, 29</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Challenge</td>
<td>3, 6, 9, 12, 15, 18, 21, 24, 27, 30</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Reliability

SPHS has both sufficient degree of test-retest reliability and internal consistency reliability. For calculating test-retest reliability, the scale was administered twice with a gap of 14 days on a sample of 200 subjects. The test-retest reliability was found to be 0.862 which was significant at 0.1 level, likewise, the internal consistency
reliability as indicated by the coefficient alpha was found to be 0.792 which was significant (Cronbach, 1951; Kaiser and Michael, 1975; Novick and Lewis 1967). Thus, SPHS possessed a sufficient degree of reliability.

Validity

SPHS has also sufficient degree of content validity. A group of experts \( (N = 12) \) provided a high level of consensus regarding the suitability of items in terms of being important indices of three components of psychological hardiness, that is, commitment, control and challenge. The overall coefficient of concordance of the rankings of 12 experts was 0.74, which was significant and it provided evidence for content validity of the whole scale. The index of reliability based upon test retest reliability coefficient was 0.92 and based upon coefficient alpha was 0.89 which meant that the test measured true ability to the extent expressed by \( r \) of 0.92 and 0.89 (Singh, 2008).

Scoring

Every item of SPHS has been provided five response categories namely ‘strongly agree’, ‘agree’, ‘neutral’, ‘disagree’ and ‘strongly disagree’. All items except item No. 17, 21, 25, 28 would be given a score of 5, 4, 3, 2, and 1 for the above five categories of responses respectively. Since these items (17, 21, 25, 28) are negative, they would be given a score of 1, 2, 3, 4, and 5 for the above five categories of responses respectively. Subsequently, the scores earned by the testee on each item are added to yield a total score. Higher the score, higher is the magnitude of psychological hardiness. Lower score indicates lower psychological hardiness. The maximum score of a testee on SPHS is \( 30 \times 5 = 150 \).

3.5.6) Personal Data Sheet for School Principal (PDSSP)

Personal Data Sheet for School Principal (PDSSP) was developed by the investigator himself. It consisted of three demographic questions eliciting personal information regarding age, gender and length of experience of sampled secondary school principals.
**Age:** Age refers to the chronological age of each respondent. School principals were asked to fill in the column meant for age. For this purpose, two categories were prepared and principals were asked to tick the appropriate category.

A: Above 45 years  
B: Up to 45 years

**Gender:** Gender refers to the sex of the school principals. This variable was measured by asking respondent principals to tick “Male” or “Female” category from the given options.

A: Male  
B: Female

**Length of Experience:** Length of experience refers to the number of years that the principals have worked as a secondary school principals or tenure of the principals in the schools shall constitute the length of experience.

This information was collected by asking the respondents to choose from a range of given alternatives indicating number of years they had been a secondary school principal. For this purpose, three categories were prepared and principals were asked to tick the appropriate option.

A: Zero to Ten Years (0-10 Years)  
B: Eleven to Twenty Years (11-20 Years)  
C: Twenty One and Above Years (21 and above Years)

### 3.6) Administration of the Tools and Collection of Data

Data collection is a term used to describe a process of collecting data. It is essentially an important part of the research process so that the inferences, hypotheses or generalisations tentatively held may be identified as valid, verified as correct or rejected as untenable. Therefore, due care is needed on the part of the investigator to collect data as it is bound to influence the entire results of the research. If the investigator has collected the data strictly following the guidelines given in the manual of the research tools then it will lead to valid and reliable results.
After the selection of the sample and the appropriate tools, the next task before the investigator was to collect data. The data was collected by the investigator through personal approach. First of all, the investigator obtained a certificate from the Chairperson of the Department of Education, Aligarh Muslim University, Aligarh showing his identity as research scholar. The investigator approached the principal of every selected school and sought his/her permission for meeting the teachers serving in the school in order to get the relevant information needed for his study. In order to seek the cooperation of principals and teachers the investigator explained the purpose of the study. The principals as well as the teachers were apprised with the objectives of the data collection and importance of research work. They were motivated and persuaded to give honest and frank responses and were ensured that the information provide by them will be kept strictly confidential and will be used only for the research purposes. Then the investigator personally handed over the questionnaires to the principals and to the teachers of the schools selected as the sample of the study. Although clear instructions were there in the questionnaires, even then, doubts and confusions, if any, were made clear by the investigator. Sufficient time was given to the respondents, after completion, it was collected from the respondents on the same day to avoid attrition or on the day as being told by the respondents, returned questionnaires were carefully checked by the investigator to see if all the items were answered or not. If any question was left, the respondents were asked to complete the same. All the principals and the teachers were contacted during the working hours of the schools. In this way the needed information for the study was collected. The collected data from the questionnaires were coded, classified and tabulated.

### 3.7) Ethical Consideration

These included confidentiality of the information gathered and having a complete and accurate database for analysis. The concerns regarding confidentiality of information were resolved by having scales filled in voluntary participation. Complete and accurate information was facilitated by having participants (principals and teachers) informed of procedures. The consent of the participants was taken. Process of data collection was not in any way annoying, inconvenient or stressful to participants. Participant’s right not to answer the questions or to withdraw from the study if they feel necessary was also given due consideration by the investigator.
3.8) Response Rate

The investigator visited so many Secondary Schools affiliated to Central Board of Secondary Education (CBSE) situated in Districts Aligarh and Ghaziabad of Uttar Pradesh (UP) and New Delhi in the process of data collection. It was amazing learning experience as majority of the principals and teachers were very cooperative and also encouraged the efforts of the investigator but, there were a few who were reluctant to cooperate and were outspokenly critical. Some said, “Why you researchers are always wasting our time”, “Researches are of no use to us”, and some said, “How can a teacher evaluate the principal of the school? Some even said, “Change the topic of your research, with this topic you will not be able to complete the research”. So the attitude of some of the principals refusing to adequately complete the questionnaires administered to them posed a constraint. It is the observation of the investigator that due to the fear of being evaluated by the teachers, several principals straightaway refused to give permission to the investigator to collect the data from their respective schools even after several visits and continuous persuasions by the investigator. Several trips to the principals were very difficult and stressful. But that notwithstanding, the investigator did what he intended to do. The investigator learnt a lot from their constructive criticisms and incorporated minor changes in his approach. The completed questionnaires returned by the respondent principals and the teachers were thoroughly checked by the investigator. It was revealed after checking each and every questionnaire that few of them were incomplete in many respects. The incomplete questionnaires were discarded and not used for the study. Apart from this, there were some principals and teachers who did not return the questionnaires and cited many illogical reasons not to complete it. In this way finally 83% response rate was achieved, which may be considered as satisfactory.

3.9) Statistical Techniques Employed

In the present study, several statistical techniques were employed by the investigator for analysing the quantitative data in accordance with the nature of variables involved and objectives of the study. The high effective group of principal (HEGP) and low effective group of principal (LEGP) were drawn by employing extreme group
technique of 27% above and below. To calculate the relationship between principals’ effectiveness and job satisfaction, work commitment, emotional maturity, and hardiness, Karl Pearson’s product moment coefficient of correlation was used and t-test was used to evaluate the significance of difference between means. To determine the proportion of variance accounted by job satisfaction, work commitment, emotional maturity, and hardiness on principals’ effectiveness, multiple regression analysis (Step wise) was used. In addition, One-Way ANOVA was employed to find out the significance of difference on the measure of principals’ effectiveness with respect to different length of years as principals and to ascertain the real position of significance difference between the groups; post hoc analysis was done by Scheffe’s Test. The results of data have been reported separately in chapter 4. In this way, obtained data were analysed by employing both descriptive as well as inferential statistics. A brief description of the descriptive and inferential statistical techniques used in the analysis of data is given below:

**Descriptive Statistics**

Descriptive statistics are the statistical methods used to organise and summarise the data through measures of central tendency, measures of variability. In the present study mean and standard deviation were calculated to serve the purpose. A brief description of the descriptive statistical techniques:

**3.9.1) Mean**

This is the simplest but most useful measure of central tendency. It is computed by dividing the sum of all the scores by the number of scores, popularly spoken of as ‘average’, is technically called the arithmetic mean (Walker, 1943). The formula for mean is:

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

[Best & Kahn, 2011, p.359]

Where,
- \(\bar{X}\) = Mean
- \(\sum\) = sum of
- \(X\) = scores in a distribution
- \(N\) = Number of scores
3.9.2) Standard Deviation

The standard deviation, the square root of the variance, is most frequently used as a measure of spread or dispersion of scores in a distribution (Best and Kahn, 2011b). The standard deviation is in reality a standard with which deviations of individual scores may be compared. The formula for standard deviation is:

\[
SD = \sigma = \sqrt{\frac{N \sum X^2 - (\sum X)^2}{N^2}}
\]

[Best & Kahn, 2011, p.365]

Inferential Statistics

Inferential statistics are used to make inferences about the population. According to Sekaran (2003), “Inferential statistics is employed when generalisations from a sample to population are made.” It includes hypotheses testing by using suitable statistical tests. For further analysis of the gathered data inferential statistics were employed such as

1) Karl Pearson’s Product Moment Coefficient of Correlation
2) ‘t-test for Significance of Difference Between Means
3) Multiple Regression Analysis
4) Analysis of Variance (ANOVA)
5) Scheffe’s test for Post Hoc Analysis.

A brief description of the inferential statistical techniques:

3.9.3) Karl Pearson’s Product Moment Coefficient of Correlation

Correlation is concerned with describing the degree of relation between variables. A coefficient of correlation is a single number that tell us to what extent two things are related, to what extent variations in the one go with variations in the other (Guilford and Fruchter, 1983) The most widely used measure of correlation is the Pearson product moment coefficient of correlation. This measure is used where the variables are quantitative, that is, of the interval or ratio type (Ferguson, 1959). A perfect correlation is +1. A perfect negative correlation is -1. A complete lack of relationship is zero. The formula for Pearson product moment coefficient of correlation is:
3.9.4) ‘t’- Test for Significance of Difference Between Means

In order to find out the significance of difference between two means t-test was used. The formula for t-test is:

\[
t = \frac{X_1^- - X_2^-}{\sqrt{\frac{\sum X_1^2 + \sum X_2^2}{N_1 + N_2 - 2}} \left(\frac{N_1 + N_2}{N_1 N_2}\right)}
\]

Where \(X_1^-\) and \(X_2^-\) = means of the two samples

\(\sum X_1^2\) and \(\sum X_2^2\) = sums of squares of the two samples

\(N_1\) & \(N_2\) = Numbers of cases in the two samples

The denominator as a whole is the standard error of the difference between means.

3.9.5) Multiple Regression Analysis

Regression Analysis was performed to determine the proportion of variance in the dependent variable as explained by the independent variable. It also intended to find out the combined effect of independent variables on dependent variable. According to Kerlinger (2009c), “multiple regression analysis is a method for studying the effects and the magnitudes of the effects of more than one independent variable on one
dependent variable using principles of correlation and regression.” Regression analysis helps in determining the potential relationship or shared common variance between the predictor and the criterion variables where dependent variable being the criterion and independent variable the predictor. Multiple regression analysis is one of the most commonly used multivariate statistical technique used for studying the relationship between a single dependent variable and several independent variables, in other words, it is used to study the individual and combined contributions of several independent variables to the variance of a dependent variable. In the present study step wise multiple regression analysis was used to study the combined and individual effects of selected independent variables viz., job satisfaction, work commitment, emotional maturity and hardiness on the effectiveness of school principals.

The formula for multiple regression is just an extension of linear regression,

\[ Y = a + b_1X_1 + b_2X_2 + \ldots \ldots \]

Where,

\[ Y = \text{variable to be predicted} \]
\[ a = \text{constant or intercept} \]
\[ b = \text{slope of predictor} \]
\[ X = \text{score of predictor} \]

3.9.6) Analysis of Variance (ANOVA)

Analysis of variance is a statistical method that analyses the independent and interactive effects of two or more independent variables on a dependent variable. ANOVA provides an effective way to determine whether the means of more than two samples are too different to attribute to sampling error. In other words, the F test or the Analysis of Variance is used for testing simultaneously the difference between several sample means. Method of ANOVA uses variances entirely in which the between group variance are pitted against each other to provide the F ratio. It is computed by using the following formula:
The critical values of F-ratio are found in F Table, which indicates the critical values necessary to test the null hypothesis of selected levels of significance.

3.9.7) Scheffe’s test for post hoc analysis

Post hoc analysis is done in the situations in which the investigator has already obtained a significant ANOVA with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other. Scheffe’s test is perhaps the most popular among all the post hoc tests. Scheffe’s procedure corrects alpha for all pair-wise or simple comparisons of means, but also for all complex comparisons of means as well.

\[
SE_{M_i-M_j} = \sqrt{msw\left(\frac{1}{ni} + \frac{1}{nj}\right)} \quad 1
\]

Where msw= within-groups mean square, and ni & nj are the numbers of cases in groups I and j

\[
S = \sqrt{(k-1)F_{0.5}(K-1,m)} \quad 2
\]

Where k= number of groups in the Analysis of Variance, & the F term is the .05 level of ratio obtained from an F table at (K-1) and m = N-K

Then

Multiply the results of formulas 1 and 2

\[
dmin = S \times SE_{M_i-M_j}
\]

Any difference to be statistically significant at the .05 level, must be as large or larger than S value

(Kerlinger 2009, p. 240)

The formulae which are mentioned above are inbuilt in the SPSS software, only necessary commands were given to do the calculations.
3.10) **Level of Significance**

The rejection or acceptance of a null hypothesis is based on some level of significance (alpha level) as a criterion. In educational and psychological circles, the 5% (.05) alpha (α) level of significance is often used as a standard for rejection. If the null hypothesis is rejected at the 0.05 level, it means that 5 times in 100 replications of the experiment, the null hypothesis is true and 95 times this hypothesis would be false. In other words, this suggests that a 95% probability exists that the obtained results are due to the experimental treatment rather than due to some chance factors. The more stringent test of significance is 0.01 level which suggests that a 99% probability exists that the obtained results are due to the experimental treatment, and hence, once in 100 replications of the experiment the null hypothesis would be true.

THE NEXT CHAPTER DEALS WITH ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS.