CHAPTER 3
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to provide a description of the research design and the methodological procedures for the study. The chapter includes sampling, tools for data collection and the statistical techniques used to analyze the data.

3.2 RESEARCH DESIGN

A 2x2x2 factorial design was used as the research design, presented in Figure 3.1. Faculties in universities were categorized into engineering and management disciplines. They were further classified into private and government universities. Also the role of gender is important and therefore has been classified.

Figure 3.1: Research Design
3.3 SAMPLING

The population for the study is faculty teaching management and engineering courses in universities in North India. The sample consisted of faculty teaching in private and government universities. A list of universities was prepared from the UGC website. The names of participants and universities have been kept confidential in the study. Questionnaires were sent through E-mails and most of the surveys were administered personally. Convenience sampling has been employed in this study. Participants in the study were not limited by gender, age, tenure or academic rank. The sample size was 376.

3.4 SAMPLE

As derived from the literature, the universities were classified using two criteria, viz; disciplines: engineering and management, and university type: private and government. Respondents included faculty, males and females, to test predictors of job satisfaction and affective commitment. In the present study, data was collected from the universities located in North of India. The states included Himachal Pradesh, Uttarakhand, Punjab, Haryana, Rajasthan and Union Territory of Chandigarh. Some participants did not fill the questionnaires. Some questionnaires were not usable because of missing values. Out of nearly 800 questionnaires, only 453 were returned. After mapping, 376 questionnaires were deemed suitable for data analysis.

3.5 DEVELOPMENT OF RESEARCH TOOLS

One of the major tasks associated with this study was the development of a questionnaire to be administered. Due to availability of standardized tools and enough research in the area, some items for job satisfaction were adapted from various related articles and literature. For
measuring affective commitment, the items were adapted from Allen and Meyer’s Three Component Model of Employee Commitment (1990). The questionnaire developed for the study consisted of three parts. Part A consisted of demographic factors including gender, age, marital status, university type, educational qualification, academic rank, discipline (engineering and management), job tenure (number of years in teaching), position tenure (number of years in the current position), living status, employment and income. Part B included seven predictors i.e. salary, promotion, work life balance, support from supervisor, support from administration, recognition at workplace and work satisfaction, to measure job satisfaction. Part C was developed to measure affective commitment. The reverse coded items in the questionnaire were recoded :1 as 5, 2 as 4, 3 as 3, 4 as 2 and 5 as 1. The reverse coded items have been indicated in the questionnaire in Appendix A.

3.6 SCORING OF THE QUESTIONNAIRES AND SCALE INTERPRETATION

The survey questionnaire was rated on a five point scale where strongly disagree was coded as ‘1’, disagree was coded as ‘2’, neutral was coded as ‘3’, agree was coded as ‘4’, and strongly agree was coded as ‘5’. The scale interpretation would be as in figure 3.2.

<table>
<thead>
<tr>
<th>Score Value</th>
<th>Below 2</th>
<th>2-3</th>
<th>Above 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

Figure 3.2: Scale Interpretation
3.7 PILOT STUDY

A pilot study was performed on a sample of 80 respondents. A pilot, or feasibility study, is a small experiment designed to test logistics and gather information prior to a larger study, in order to improve the latter’s quality and efficiency. A pilot study can reveal deficiencies in the design of a proposed experiment or procedure and these can then be addressed before time and resources are expended on large scale studies. The aim of pre-testing was (i) to check the reliability and validity of the questionnaire (ii) to ascertain the time required to complete the questionnaire (iii) to check the adequacy of response categories formulated and (iv) to check the overall appropriateness of the questions. The questionnaire was discussed with respondents as well. The questionnaire had high content validity. The content validity (which concerns the relevance of the questions asked to the quality being measured) of the questionnaire was ensured through feedback from senior faculty at different stages during its development. The Cronbach's Alpha Coefficient for Part B (i.e. job satisfaction) was 0.892 and for Part C (i.e. affective commitment) was 0.581. After the pilot study, four questions were deleted, three from Part B and one from Part C.

3.8 PROCEDURE FOR DATA ANALYSIS

Missing data is inevitable in survey research. All subjects with missing data were eliminated before data analysis are performed. t-Test, ANOVA, Pearson’s correlation, Association Rules and Regression technique was used to analyze data in the current study. These tests were conducted using SPSS and WEKA.

The internal consistency (Cronbach’s alpha) of each subscale was estimated using SPSS 18.0. Alpha coefficients greater than 0.70 are assumed to be adequate for internal consistency in the field of social science (Hair, Anderson, Tatham & Black, 1998; De Vaus, 2002). After the deletion of four items from the questionnaire, leaving a total of thirty six items in Part B and Part...
C, the Cronbach's Alpha Coefficient for Part B was 0.892 and for Part C was 0.732. The tests used for testing hypothesis are:

### 3.8.1 T-Test

An independent sample T-test was used to analyze objective 1 and 2. T test is used to determine whether there is a significant difference between two sets of scores. The results have been split into private and government universities. The first test was run for faculty teaching engineering and management courses and the second test was run for male and female faculty.

### 3.8.2 ANOVA (One-Way/ Two-Way)

One-way ANOVA is used for comparing the means of more than two groups or levels of an independent variable. Impact of individual demographic variables has been measured on predictors of job satisfaction. Two-way ANOVA is used for comparing the means of more than two groups or levels of two independent variables. This test allows us to examine the interaction effect of two independent variables on predictors of job satisfaction. These tests have been used to measure objective 3.

### 3.8.3 Correlation

Correlation looks at the relationship between two variables in a linear fashion which has been used to analyze objective 4. A Pearson-product-moment correlation describes the relationship between two continuous variables. This measures the relationship between job satisfaction and affective commitment.

### 3.8.4 Association Rules

Association rules are useful in data mining for analyzing and predicting behaviors. Association
rules are formed by analyzing data for frequent if/then patterns and using the criteria support and confidence to identify the most significant relationships. Support is an indication of how frequently the items emerge in the data set. Apriori algorithm has been used in order to predict job satisfaction. The minimum confidence level kept for analysis is 60%. The scoring has been converted from numeric’s to alphabets i.e. 1 as “a”, 2 as “b”, 3 as “c”, 4 as “d” and 5 as “f”. This algorithm is used to analyze objective 5.

3.8.5 Multiple Regression

Multiple Regression is used when independent variables are correlated with one another and with the dependent variable. The result of regression is an equation that represents the best prediction of a dependent variable from several independent variables, which is used to analyze objective 5.

3.9 Conclusion

In this chapter, research design has been presented. Research design, sampling, development of research tools, and sample have been discussed in detail. This chapter also explained the tools which are used to analyze the data. t-Test, ANOVA, Correlations, Association Rules and Regression techniques are used to test the hypotheses of the study.

In next chapter, details of the findings and analyses of the study are presented. It starts with demographic analysis of the participants. Then, it presents the mean and standard deviations of the various scales of the research instruments used. Each hypothesis was tested using the above mentioned tests.