CHAPTER 3

RESEARCH METHODOLOGY

“If necessity is the mother of invention, scientifically developed production is the mother of scientific research”

-Arthur Edvin Kenne

The above written quote explains the importance of methodology in the research without which no one can develop the base for scientific research. Research Methodology is a procedure to solve a research problem and it is considered a science of systematic proceedings to the solution of the given problem. Research Methodology comprises of research methods viz. research design, data collection techniques, sampling methods, analysis of data and other components of research methodology. The factors determining satisfaction level among management students and academicians in universities have been examined under the review of literature. This part of the study focuses upon the research methodology which is applied to achieve the set objectives under the present study.

The research methodology is presented as follows:

3.1 presents the research problem, by introducing a problem statement.

3.2 establishes the objectives for research, providing a direction for the study.

3.3 introduces the hypotheses for research, according to the set objectives.

3.4 states the scope and relevance of the study, with respect to its application.

3.5 highlights the detailed methodology including sample size and design, instruments for data collection, tabulation and codification of the data and procedure for analysis.

3.6 points out the limitations of the present study.

3.7 outlines the organization of the study, showing the division into various chapters.

3.1 Problem Statement

Globalization promises the dramatic and rewarding changes to the higher education. It has changed the face of education sector. The impact of globalization and privatization can be seen on the management education as well. Where IIM’s, top business schools and
universities are performing very well, at the same time rest of the universities and institutes are not able to provide placement even to 10% students and according to ASSOCHAM survey, the number of MBA seats has tripled and the placement has gone down by 40% in the last five years (TOI, 12th January, 2016). According to the opinion of experts, the main cause of problem is the satisfaction of management students and academicians which was mentioned in the same article of TOI. The students and academicians are the most important pillars of any educational institutes who play a very important role in building up the image of any university. Satisfaction among students and academicians become more important because of rising competition due to privatization. To analyze the satisfaction of students and academicians, this study has identified the factors of satisfaction through review of literature and quantitative analysis. In this stiff competition, private universities have given challenges to the state universities due to privatization which is another reason to go for this study. Therefore, it is important to study the advantages and drawbacks of state/public and private universities and how does these factors affect the satisfaction of students and academicians associated with the universities. This study throws light on the comparison of public and private universities. So the present study “Satisfaction of Management Students and Academicians in Universities of Haryana” has been proposed.

3.2 Objectives of the Study

In the light of the above problem statement, the main objective of this study is to analyze level of satisfaction of students and academicians in state/public and private universities of Haryana. To achieve this objective, the following sub objectives have been identified:-

1. To identify the different factors influencing satisfaction of management students and academicians in universities of Haryana.
2. To compare the level of satisfaction of management students in state/public and private universities of Haryana.
3. To compare the level of satisfaction of management academicians in state/public and private universities of Haryana.
4. To suggest/explore new ways for enhancement of satisfaction level of students and academicians through which a university can build up its image in this competitive education era.
3.3 Hypotheses

The following null hypotheses are formulated in the consistent with set objectives under the study which are categorized into two parts:

1. **Students’ Satisfaction**

   - **H_{S01}** The hypothesized model for students’ satisfaction does not fit to the data.
   - **H_{S02}** There is no relationship among the major factors of students’ satisfaction.
   - **H_{S03}** There is no significant difference in students’ satisfaction for admission procedure factor between public and private universities of Haryana.
   - **H_{S04}** There is no significant difference in students’ satisfaction for fee structure factor between public and private universities of Haryana.
   - **H_{S05}** There is no significant difference in students’ satisfaction for physical facilities factor between public and private universities of Haryana.
   - **H_{S06}** There is no significant difference in students’ satisfaction for ordinance and scheme factor between public and private universities of Haryana.
   - **H_{S07}** There is no significant difference in students’ satisfaction for teaching factor between public and private universities of Haryana.
   - **H_{S08}** There is no significant difference in students’ satisfaction for support from department factor between public and private universities of Haryana.
   - **H_{S09}** There is no significant difference in students’ satisfaction for student teacher relationship factor between public and private universities of Haryana.
   - **H_{S10}** There is no significant difference in students’ satisfaction for extracurricular activities factor between public and private universities of Haryana.
   - **H_{S11}** There is no significant difference in students’ satisfaction for industrial visit factor between public and private universities of Haryana.
   - **H_{S12}** There is no significant difference in students’ satisfaction for training and placement factor between public and private universities of Haryana.
   - **H_{S13}** There is no significant difference in students’ satisfaction support from administration and non-teaching staff factor between public and private universities of Haryana.
   - **H_{S14}** There is no significant difference in students’ satisfaction for safety and security factor between public and private universities of Haryana.
There is no significant difference in students’ overall satisfaction between public and private universities of Haryana.

2. Academicians’ Satisfaction

**H\textsubscript{A01}**: The hypothesized model for academicians’ satisfaction does not fit to the data.

**H\textsubscript{A02}**: There is no relationship among the major factors of academicians’ satisfaction.

**H\textsubscript{A03}**: There is no significant difference in academicians’ satisfaction for teaching and research factor between public and private universities of Haryana.

**H\textsubscript{A04}**: There is no significant difference in academicians’ satisfaction for working environment and physical facilities factor between public and private universities of Haryana.

**H\textsubscript{A05}**: There is no significant difference in academicians’ satisfaction for administrative and non academic duties factor between public and private universities of Haryana.

**H\textsubscript{A06}**: There is no significant difference in academicians’ satisfaction for promotion factor between public and private universities of Haryana.

**H\textsubscript{A07}**: There is no significant difference in academicians’ satisfaction for salary and remuneration factor between public and private universities of Haryana.

**H\textsubscript{A08}**: There is no significant difference in academicians’ satisfaction for supervision factor between public and private universities of Haryana.

**H\textsubscript{A09}**: There is no significant difference in academicians’ satisfaction for colleagues’ behavior factor between public and private universities of Haryana.

**H\textsubscript{A10}**: There is no significant difference in academicians’ satisfaction for dealing with non teaching staff factor between public and private universities of Haryana.

**H\textsubscript{A11}**: There is no significant difference in academicians’ satisfaction for job clarity and security factor between public and private universities of Haryana.

**H\textsubscript{A12}**: There is no significant difference in academicians’ satisfaction for support from higher authorities of the university factor between public and private universities of Haryana.

**H\textsubscript{A13}**: There is no significant difference in academicians’ overall satisfaction between public and private universities of Haryana.
3.4 Scope and Relevance of the Study

This study is confined to the students and academicians of management departments in state/public and private universities of Haryana. This study will have practical implications for students, academicians, researchers and top level management of universities of Haryana in particular and India in general.

**Table 3.1: List of Selected Universities**

<table>
<thead>
<tr>
<th>Category</th>
<th>Name of the University</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State/Public Universities</strong></td>
<td>Baghat Phool Singh Mahila Vishwavidyalya, Khanpur (Sonepat)</td>
</tr>
<tr>
<td></td>
<td>Choudhary Devi Lal University, Sirsa</td>
</tr>
<tr>
<td></td>
<td>Guru Jambheswer University Sci. and Tech., Hisar</td>
</tr>
<tr>
<td></td>
<td>Kurukshetra University, Kurukshetra</td>
</tr>
<tr>
<td></td>
<td>Maharshi Dayanand University, Rohtak</td>
</tr>
<tr>
<td><strong>Private universities</strong></td>
<td>Amity University, Manesar</td>
</tr>
<tr>
<td></td>
<td>Apeejay Satya University, Gurgaon</td>
</tr>
<tr>
<td></td>
<td>Baba Mastnath University, Rohtak</td>
</tr>
<tr>
<td></td>
<td>Mahrishi Markandeshwer University, Ambala</td>
</tr>
<tr>
<td></td>
<td>Manav Rachna International University, Faridabad</td>
</tr>
</tbody>
</table>

Source: Generated by researcher

There are eighteen state/public universities and twenty private universities in Haryana as listed on UGC website (accessed on 6th January 2016). For this study, five public and five private universities are considered as shown in table no. 3.1. Out of total public and private universities in Haryana, the ten universities which are well known have been considered for sample. Researcher has tried to take only one university from one city so that responses of respondents can be reliable.
This study would have a great relevance for students, academicians, researchers, universities, colleges and policy makers. Last but not least, students and academicians of universities would be able to choose appropriate universities after analyzing the factors influencing students and academician’s satisfaction. Preference to the factors can be judged for choosing universities for admission for students and to join a particular university for academicians. Further, researchers can review this study for their future researches.

3.5 Research Design

To achieve the aforesaid objectives a proper research methodology is followed. The detailed research methodology includes:

I. Sample design and sample size
II. Instruments for data collection
III. Tabulation and codification of data
IV. Procedure for data analysis

I. Sample Design and Sample Size

The population for this study includes academicians and students of management universities of Haryana. All state/public and private universities of Haryana which provide management courses are included in the population. Out of 38 public and private universities in Haryana, 5 public and 5 private universities are chosen from the population that offers management (MBA and PGDM courses). 150 academicians, 15 from each university and 1000 students, 100 from every university are approached to participate. A sample of 150 academicians and 1000 students is chosen to answer the questions of the questionnaire which is decided with the help of formula of sample size for known population. As the student’s intake and number of academicians in public universities which is mentioned on their website, so the sample size of students and academicians for public universities with sample size formula mentioned below. Since researcher has taken equal number of public and private universities and have to make comparison that’s why sample size of students and academicians would have been equal for public and private universities. Sampling is the process of choosing a small group of people that would represent the population. The method of convenient random sampling is used. In this type of sampling, the researcher approaches respondents who are easy accessible and available, that is, based on researcher’s convenience (Bryman, 2012). The distribution of sample size is done in the following way in table 3.2.
Sample Size - Infinite Population (where the population is greater than 50,000)

\[ SS_I = \frac{Z^2 \times p \times (1 - p)}{C^2} \]

\(SS_I = \) Sample Size for Infinite Population
\(Z = \) Z-value (e.g., 1.96 for a 95 percent confidence level)
\(P = \) Percentage of population picking a choice
\(C = \) Confidence interval, expressed as decimal (e.g., .04 = +/- 4 percentage points)

The Z-values for confidence levels are:
1.645 = 90 percent confidence level
1.96 = 95 percent confidence level
2.576 = 99 percent confidence level

Example:
\[ SS_I = 3.8416 \times .5 \times .5 \]
\[ .0016 \]
\[ SS_I = 600 \]

Sample Size – Finite Population (where the population is less than 50,000)

\[ SS_F = \frac{SS_I}{1 + (SS_I \times p - 1)} \]

\(SS_F = \) Sample Size for Finite Population
\(SS_I = \) Sample Size for Infinite Population
\(p = \) Population

The total number of students and academicians in public universities are 1300 and 79 approximately respectively in the academic session 2015-16 mentioned on official sites (accessed on 26 November, 2015).

Sample Size for Students in Public University = \[ \frac{600}{1 + \frac{600}{1300} - 1} \] = 410

Sample Size for Academicians in Public University = \[ \frac{600}{1 + \frac{600}{79} - 1} \] = 70
To make a round figure of sample size, researcher targeted 500 students and 75 academicians each from public and private universities.

### Table 3.2: Distribution of Sample Size across Selected Universities

<table>
<thead>
<tr>
<th>Category</th>
<th>Universities</th>
<th>Students</th>
<th>Academicians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Universities</strong></td>
<td>Guru Jambheswer University Science and Technology., Hisar</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Baghat Phool Singh Mahila Vishwavidyalaya, Khanpur (Sonipat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maharshi Dayanand University, Rohtak</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Choudhary Devi Lal University, Sirsa</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Kurukshetra University, Kurukshetra</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td><strong>Private Universities</strong></td>
<td>Amity University, Manesar 100 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apeejay Satya University, Gurgaon</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Baba Mastnath University, Rohtak 100 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mahrishi Markandeshwer University, Amba 100 15</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Manav Rachna International University, Faridabad 100 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>1000</strong></td>
<td><strong>150</strong></td>
</tr>
</tbody>
</table>

Source: Generated by researcher

**II. Instruments and Procedure for Data Collection**

The researcher has used both primary as well as secondary data to conduct this research. Primary data would be collected through survey and observation method. Two structured questionnaires will be designed, i.e. one for academician’ satisfaction, second for student satisfaction. Two well structured questionnaires are developed separately for students and academicians (Annexure-I and Annexure-II). Secondary data would be collected through the records of universities, websites of universities, books, journals, research papers and published and unpublished thesis etc.

**Students’ Satisfaction Instrument**

In the initial phase of developing the questionnaire for students total 100 statements to judge students satisfaction were prepared with the help of literature review, personal observation, meeting with students and research scholars, and then these statements are again discussed with experts, senior academicians and management alumni for modification. After this 93 statements were selected and a pilot survey was conducted on 187 students of public and
private universities in Haryana to ascertain the workability of these statements. Finally 85 statements were included in the final questionnaire for assessment of students' satisfaction. The questionnaire is divided into three parts:

- The first part consists of seven items about demographics as well as academic details of students. This part of the questionnaire inquires about their demographic information (age, gender, residence), academic details (year of study, specialization, graduation background, career goals and specialization) of students.

- The second part comprises of 85 statements about students’ satisfaction in a particular university, which have been clubbed into the 12 factors naming admission procedure, fee structure, physical facilities, ordinance and scheme, teaching, support from department, student-teacher relationship, extra-curricular activities, industrial training, training and placement, support from administration and nonteaching staff, safe and secure campus and overall satisfaction of students.

- The third part embodies three questions: first covers perception of students towards the image of university and second regarding measurement of preference against various factors of students’ satisfaction. Lastly, there is a statement of open suggestions from students. Dependent and independent variables have been shown below:

![Diagram of dependent and independent variables](image)

**Figure 3.1: Dependent and Independent Variables (Students’ satisfaction)**

39
In this instrument, a framework has been designed to determine satisfaction. According to the framework, there are 12 independent variables that determine satisfaction among students and one dependent variable i.e. overall satisfaction.

**Academician’ Satisfaction Instrument**

At the first stage of developing the questionnaire for academicians total 95 statements to judge academicians’ satisfaction were prepared with the help of literature review, personal observation, meeting with academicians and research scholars, and then these statements are discussed with experts, academicians and management alumni for modification. After this 83 statements were selected and a pilot survey is conducted on 46 academicians of public and private universities to ascertain the workability of these statements. Finally 77 statements are included in the final questionnaire for assessment of academicians’ satisfaction. The questionnaire is divided into three parts:

1. The first part consists of seven items about demographics (age, gender, marital status and income), as well as work details (length of service, leadership and management responsibilities, designation) of academicians of universities in Haryana.

2. The second part comprises of 77 statements about academicians’ satisfaction which have been clubbed into the 10 factors named teaching and research, working environment and physical facilities, administrative duties and other non academic duties, opportunities for promotion, salary and remuneration, supervision, colleagues behavior, dealing with non teaching staff, job clarity and security and support from higher authority of university.

3. The third part embodies three questions: first about perception of academicians about the image of university and second covers the measurement of preference against various factors of academicians’ satisfaction. Finally, there is statement of open suggestions from academicians.

A framework has been designed for academicians’ satisfaction in this instrument. According to the framework, there are 10 independent variables that determine satisfaction among academicians and one dependent variable i.e. overall satisfaction. Dependent and independent variables have been shown below:

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III. Tabulation and Codification of Data

To analyse the demographic characteristics of students, following scoring such as Age (less than 25 =1, 25-30 =2, 30 and above =3), Gender (male =1, female =2), Year (previous =1, final =2), Residence (Haryana =1, other state =2, foreign country =3), Graduation background (arts =1, commerce =2, science =3, other =4), Career goal (corporate =1, entrepreneur =2, academic =3, other =4) and Specialization (human resource management =1, finance =2, marketing =3, international business =4, business analyst =5) was used. For analysing the demographic characteristics of academicians, following scoring such as Designation (professor =1, associate professor =2, assistant professor =3, teaching associate =4), Age (less than 30 =1, 30-40 =2, 40-50 =3, more than 50 =4), Gender (male =1, female =2), Marital status (unmarried =1, married =2), Length of service (0-5 =1, 5-10 =2, 10-15 =3, 15+ =4), Monthly income (21,000-30,000 =1, 31,000-40,000 =2, more than 40,000 =3) and Leadership and Management Responsibility (Head, Dean, Director, Proctor =1, holding another managerial post =2, not in charge of any academic group =3).

The labelling of the statements used to study the satisfaction of students and academicians as follows:

Students’ satisfaction factors: Admission procedure (SF1) {AP1, AP2, AP3, AP4}, Fee structure (SF2) {FS1, FS2, FS3, FS4, FS5, FS6, FS7}, Physical facilities (SF3) {PF1, PF2,
Academicians’ satisfaction factors: Teaching and research (AF1) \{TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9, TR10, TR11, TR12, TR13, TR14, TR15, TR16\}, Working environment and physical facilities (AF2) \{WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8, WP9, WP10, WP11, WP12, WP13, WP14\}, Administrative and non academic duties (AF3) \{AD1, AD2, AD3, AD4\}, Opportunities for promotion (AF4) \{OP1, OP2, OP3, OP4, OP5\}, Salary and remuneration (AF5) \{SR1, SR2, SR3, SR4, SR5, SR6, SR7\}, Supervision (AF6) \{SV1, SV2, SV3, SV4, SV5, SV6, SV7, SV8\}, Colleagues’ behaviour (AF7) \{CB1, CB2, CB3, CB4, CB5, CB6\}, Dealing with non teaching staff (AF8) \{NTS1, NTS2, NTS3, NTS4\}, Job security and clarity (AF9) \{JCS1, JCS2, JCS3, JCS4, JCS5, JCS6, JCS7, JCS8\} and Support from higher authorities of University (AF10) \{SHA1, SHA2, SHA3, SHA4, SHA5\}.

To assess the students’ satisfaction and academicians’ satisfaction in public and private universities in Haryana, five point scales (strongly satisfied, satisfied, neutral, dissatisfied, strongly dissatisfied) is used. A score 5 is assigned for strongly satisfied, 4 for satisfied, 3 for neutral, 2 for dissatisfied and 1 for strongly dissatisfied to measure each statements of students’ satisfaction and academicians’ satisfaction factors. To examine the preference of students and academicians towards various satisfaction factors, ranking method is used. Ranking is done in ascending order where 1 is assigned highly preferential/important factor and 12/10 is assigned for least important factor or. To analyze the demographic profile of students and academicians, categorical and nominal scale is used according to options.

IV. Procedure for Data Analysis

The analysis is carried out with the help of AMOS (Advanced Managed Object Scripting) and SPSS (Statistical Package for Social Sciences) and MS Excel. The total analysis is
divided into two sections i.e. analysis of students’ satisfaction and analysis of academicians’ satisfaction.

In the first part of data analysis, to assess the students’ satisfaction and academicians’ satisfaction, reliability of data is checked by calculating Cronbach’s Alpha values. To analyze the demographic profile of students and academicians, Frequency and Percentage method is used. AMOS is used for Path Diagrams and Confirmatory Factor Analysis (CFA). SPSS is used for Stepwise Regression Method and Independent Sample t-test. Confirmatory factor analysis gives various estimates SRW (standardized regression weight), MI (modification indices), SRC (squared residual correlation) of measured statements for all the factors of students’ satisfaction like admission procedure, fee structure etc. and academicians’ satisfaction like teaching and research, salary and remuneration and job security and clarity etc. The measured statements with a factor loading (standardized regression weight) of >0.6 are retained for applying confirmatory factor analysis (CFA) technique (Brown, 2015). CFA is applied to confirm the factors and to test the model fit of data and correlation among different factors of students’ satisfaction and academicians’ satisfaction. To identify the most contributing factors in overall satisfaction, stepwise regression method is applied after computing all factors of students and academicians satisfaction. Then CFA is conducted again for overall model fit only on most contributing factors to the overall satisfaction for students and academicians. To compare the difference in satisfaction level of students and academicians in state/public and private universities of Haryana, Independent sample t-test is applied on all the factors of students’ satisfaction and academicians’ satisfaction. To measure the perception of students and academicians about the image of universities, percentage method or frequency distribution has been used. Mean and standard deviation technique is used for analysing the preference against various factors of students’ and academicians’ satisfaction.

The researcher has used the following tools and techniques to carry out research

➢ Reliability and Validity Analysis

Cronbach’s Alpha is a tool which is used to assess the reliability of the responses of the questionnaires. Reliability refers to test consistency among the statements of factors. The objective is to ensure that responses are not varied across time period. Secondly, reliability is used for internal consistency. Cronbach’s Alpha is the most widely used measurement of the
reliability. Generally, value of Cronbach’s Alpha is considered good 0.80 and above (Robert, 2006).

Cronbach’s Alpha (\( \alpha \)) is defined as:

\[
\alpha = \frac{K}{K - 1} \left(1 - \frac{\sum_{i=1}^{K} \sigma_{i}^2}{\sigma_X^2}\right)
\]

Where \( K \) is the number of variables/items, \( \sigma_X^2 \) is the variance of the observed total scores of the construct and \( \sigma_{i}^2 \) the variance of component \( i \) for variable/construct (George and Mallery, 2003). Values of Cronbach’s Alpha for students’ satisfaction and academics’ satisfaction have shown in the tables 3, 4 respectively with the sample for pilot study and completed survey.

- **Pilot Study**

A pilot study is carried before the complete data collection stage. Malhotra and Das (2009), refers pilot study as a testing of questionnaire on a small size of sample to determine and remove potential problem. The appropriateness of the statements of the questionnaire can be tested through pilot study like question content, wording, sequence, form and layout.

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>No. of Statements/Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students’ Satisfaction</strong></td>
<td>85</td>
<td>Pilot Study: 0.982 (N=187)</td>
</tr>
<tr>
<td><strong>Academician’s Satisfaction</strong></td>
<td>77</td>
<td>Pilot Study: 0.977 (N=46)</td>
</tr>
</tbody>
</table>

Validity can be defined as an extent to which result is accurate. The construct validity means the extent to which a set of measured variables actually reflects the theoretical latent construct. This deals with accuracy of measurement. Researcher has discussed two types of validity in confirmatory factor analysis:

1. Convergent validity assesses the degree to which two statements of the same factors correlated. Higher correlation indicated that these two statements can be clubbed into one factor. Convergent validity exists when all factor loadings will be greater than 0.7.
and average variance extracted (AVE) should be greater than 0.5 and composite reliability (CR) should be higher than 0.7 (Chin, 1998).

2. Discriminant validity assesses the degree to which two factors are correlated. Higher the correlation means these two factors can be clubbed in one factor. If the value of maximum shared variance (MSV) is less than average variance extracted and average shared variance (ASV) value is less than AVE then there will be no validity concern (Hair et. al., 1986).

3. Composite reliability is the coefficient which can be obtained by true score of variances and covariance. For discriminant validity CR should be greater than AVE (Hair et. al., 1986).

> **Confirmatory Factor Analysis (CFA)**

CFA is a statistical technique which is used to verify the factor structure of a set of observed statements. In a confirmatory factor analysis, loading of scale items is known and CFA confirms the convergent reliability and validity but in exploratory factor analysis loading of scale items is unknown and factors will be extracted with the help of factor analysis. In CFA, researcher performs the zero degree, first degree and second degree confirmatory factor analysis. Zero degree factor analysis confirms the convergent reliability and validity between statements and first degree factor analysis confirms the discriminant reliability and validity between factors. Second degree factor analysis confirms the relationship between dependent and independent variables (Hafiz et al., 2013).

**Evaluation Criteria for Measurement Model**

There are following evaluation criteria for measurement model which are proposed by Byrne (2013):

1. $\Psi^2$ Test
2. $\Psi^2/df$ Ratio
3. **Comparative Fit Index (CFI)**
4. **Goodness of Fit Index (GFI)**
5. **Root Mean Square Error of Approximation (RMSEA)**
For improving the model following statistics are used:

1. Standardized Regression Weight (SRW)
2. Standardized Residual Covariance (SRC)
3. Modification Indices (MI)

$\chi^2$ Test and $\frac{\chi^2}{df}$ Ratio are very sensitive to the sample size. In case of large sample it will not be helpful for model fitness but CFI, GFI and RMSEA are good measures for model fitness. The acceptance rule for above statistics is in the table 3.5 and 3.6:

- **$\chi^2$ Test**
  
  The most fundamental measure of overall fit is chi square statistic which is the only statistically based measure of goodness of fit available in CFA. In applying chi square statistics, researcher wishes to reject the null hypothesis so as to claim support for its alternative. According to statistics rule, smaller the value, the better fit of the model (Robert, 2006).

- **Comparative Fit index**
  
  It is non statistical measure and value of this dimension should be in the range 0 (poor fit) to 1 (perfect fit) for the best fit of model. If the value nearby 1 then model will be best fit of the data (Robert, 2006).

- **Goodness of Fit Index**
  
  GFI measure how much better the model fits compared with no model at all. The value of GFI also ranges between 0 and 1. The model considers best fit if the value is nearby 1 (Robert, 2006).

- **Root Mean Square Error of Approximation**
  
  RMSEA takes into account the error of approximation in the population. It is the measure of discrepancy per degree of freedom. Values are ranging from 0.05 to 0.10 are deemed acceptable (Robert, 2006).

First table used for individual factors and overall model fitness. Second table is used for model improvement by eliminating and correlating the items which has low SRW, high SRC and high MI.
Path Diagram

Path diagram is a graphical representation of the pattern between statements with its factors. It is the general linear model with measured factors (kumar, 2010).

Standardized Regression Weight

The standardized regression weight or beta coefficient represents the contribution of each independent variable to the prediction of the dependent variable. It is a partial correlation between dependent and independent variables. Since the beta is measured in units of standard deviation, so, it is called standardized regression weight (kumar, 2010).

Standardized Residual Covariance

In the symmetric matrix, each residual covariance has been divided by an estimate of its standard error. In sufficiently large samples, the standardized residual covariance have a standard normal distribution if the model is correct. So, if the model is correct, most of them should be less than two in absolute value. The value of SRC will be ranging between -2.5 to +2.5 (kumar, 2010).

Modification Indices

A very useful measure in assessing the fit of a model involves modification indices which are calculated for each non-estimated parameter. Each such MI measures how much a chi-square value is expected to decrease if a particular constrained parameter is set free and the model is reestimated. The larger value of MI tell us which parameter is set free to improve the model (kumar, 2010).

Table 3.4: Model Fit Indices

<table>
<thead>
<tr>
<th>Fit Index</th>
<th>Values</th>
<th>Model Fitness</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI</td>
<td>&lt; 0.80</td>
<td>Unacceptable</td>
</tr>
<tr>
<td></td>
<td>0.80 to 0.90</td>
<td>Acceptable</td>
</tr>
<tr>
<td></td>
<td>&gt;0.90</td>
<td>Good</td>
</tr>
<tr>
<td>GFI</td>
<td>&lt; 0.80 Unacceptable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.80 to 0.90</td>
<td>Acceptable</td>
</tr>
<tr>
<td></td>
<td>&gt;0.90 Good</td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt;0.05</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>&lt;0.08 Acceptable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;0.10 Mediocre</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;=0.10 Poor</td>
<td></td>
</tr>
</tbody>
</table>

Source: Kumar. G., 2010
### Table 3.5: Model Evaluation Test Statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Criteria</th>
<th>Model Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRW</td>
<td>&gt;=0.4</td>
<td>Acceptable</td>
<td>Not Required</td>
</tr>
<tr>
<td></td>
<td>&lt;0.4</td>
<td>Unacceptable Required</td>
<td></td>
</tr>
<tr>
<td>SRC</td>
<td>-2.58 to 2.58</td>
<td>Acceptable</td>
<td>Not Required</td>
</tr>
<tr>
<td></td>
<td>Otherwise</td>
<td>Unacceptable Required</td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>&lt;10</td>
<td>Acceptable</td>
<td>Not Required</td>
</tr>
<tr>
<td></td>
<td>&gt;=10</td>
<td>Unacceptable Required</td>
<td></td>
</tr>
</tbody>
</table>

Source: Kumar. G., 2010

- **Factor Loading**
  
The size of the factor loading is important dimension. In case of high convergent validity, high loading on the factor would indicate that statements converge on a common point on their latent construct. A rule of thumb is that standardized loading estimates should be 0.5 or higher, and 0.7 or higher. The reason of this rule of thumb is that, the square of standardized factor loading represents how much variation in an item is explained by the latent factor and is termed the Variance Extracted of the item. (Hair, 2006)

- **The Critical Ratios**
  
The critical ratios in SEM are used to identify the significance of standardized regression weights and squared multiple correlations in a path diagram. When the critical ratios are > 1.96, path is considered significant at 0.05 levels (Byrne, 2013).

- **Average Variance Extracted**
  
  Average variance extracted is an observed variable that explain the variance or average contribution of measures in particular construct. For convergent reliability and validity value of average variance extracted should be greater than 0.05 (Hair et. al, 1986).

- **Average and Maximum Shared Variance**
  
  Average shared variance is the observed average of standard regression weights between factors and maximum square variance is the observed maximum value of standard regression weights between factors. For discriminant validity, value of average variance extracted should be greater than maximum shared variance and value of maximum shared variance should be greater than average variance explained (Hair et. al, 1986).
➢ **Step wise Regression Method**

Step wise regression method analyze the relationship between dependent and non-independent variables. It shows the relationship between dependent variable and major independent variables dependent upon the value 0.05 that shows which variable is significant and insignificant. Value less than 0.05 will show the variable is significant otherwise insignificant (Robert, 2006).

➢ **Independent Sample T-Test**

The independent sample t-test is used for comparing the mean scores of two samples. This test is basically used for testing of Hypothesis that there is no significant difference between the mean score of two samples. Here, ‘t’ is the value of statistics, which shows the significant difference between the mean score of two samples. If ‘t’ value is less than 0.05, it means there is significant difference exist otherwise there will be no significant difference between the mean scores of two samples (Moore, 2007).

### 3.6 Limitations of the Study

Although the study is carried out in a systematic and planned way, yet the number of limitations have come across the study which was inherent in nature and was out of control of researcher. The effectiveness of the study would be felt only when results are read along with limitations. The more limitations of the study are given below:

1. Data has been obtained through questionnaires and therefore, may be subject to response consistency effect. Self-reported measures can be potentially biased.

2. The study was qualitative in nature. The respondents may have interpreted the statements in different ways.

3. Since there are number of statements in the questionnaire prepared for students and academicians they were filling fatigue in responding all statements.

4. **Time is a major constraint of study as researcher would not be able to cover all aspect of university system.**

5. Higher authorities were not ready to share practices and confidential information of universities as they were fear of misuse their information

6. **Sample itself is a constraint as the study was limited to Haryana and may not represent the whole university system of India.**
3.7 Organization of the Study

Chapter I Introduction This chapter will introduce education system and status of state and private universities in Haryana. It will include the importance of student’s satisfaction and academicians’ satisfaction for building up image of any university.

Chapter II Literature Review This chapter would constitute review of literature that would give a brief account of the researches undertaken in the field related to student’s satisfaction and academicians’ satisfaction and then points out the research gap.

Chapter III Research Methodology This chapter would deal with the research mechanism adopted to address the problem. It includes the problem statement, research design, sample size, data collection, tools and techniques for analysis.

Chapter IV Satisfaction of Management Students in Universities of Haryana This chapter will present level of satisfaction of students in state and private universities. It will present the comprehensive analysis of primary data which will be obtained through the structured questionnaire.

Chapter V Satisfaction of Management Academicians in Universities of Haryana This chapter will present level of satisfaction of academicians in state and private universities. It will show the comprehensive analysis of primary data which will be obtained through the structured questionnaire.

Chapter VI Findings and Suggestions This chapter would conclude the results. It will present certain implications and recommendations which would help university system to understand the factor which affects students’ satisfaction and academicians’ satisfaction. It would also cover the limitations of the study and research directions for the future researchers.