CHAPTER-III

RESEARCH METHODOLOGY

According to Dwivedi (1997) research is a systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among behavioural phenomena. The terms systematic and ‘controlled’ imply that research is ordered in a manner that researchers can have critical faith in its results. The term empirical implies that, whatever the researchers believes, it must be put to a vigorous test. The subjective beliefs of the behavioural scientist must be verified against the objective reality. According to Young (1949) research is the systematic method of discovering new facts or verifying old facts, their sequences interrelationships, casual explanations and the natural laws, which govern them. It involves the application of scientific method for the understanding studying and analysis in order to modify, correct or verify the existing knowledge as a system. Research is undertaken to discover answers to questions by applying scientific method. It is careful critical enquiry or examination in seeking facts or principles, diligent investigation in order to ascertain something (Ghosh, 1992).

Research methodology is simply a systematic process for accurately capturing data (McCormack and Hill, 1997). Research methodology will depend on the research problem identified, the techniques and tools, the data and time available and the experience and capability of the researcher.
3.1 RESEARCH PROBLEM

The literature review reveals that there are very few studies in India, which explore the concept and the advantage of being a learning organization. After having extensive discussions with the research guide, academicians, key HRD people in industries, and colleagues, the research problem has been formulated as follows:

"Whether the organizations in India have the characteristics of the learning organization? Whether the employees of the organization are satisfied with the learning characteristics in their organization? Whether there is any relationship between learning organization and competency? Does the relationship differ within organizations that are operating in Manufacturing, Information technology and Telecom sectors?"

Based on the research problem conceived, research objectives (refer 1.10 for details) were set and the study was conducted to achieve the same.

3.2 HYPOTHESES

A hypothesis is a tentative generalization, the validity of which has got to be tested. After conducting an extensive review of literature, the following hypotheses predominantly in the null form are developed in line with the research problem and objectives:

The main hypotheses are spelt out as sub hypothesis to facilitate statistical testing.
H 1: Learning score (LSA) as well as its dimensions will not differ within the organizations in the manufacturing sector.

H 1.1: Learning score (LSA) will not differ within the organizations in the manufacturing sector.

H 1.2: LSA dimension ‘A learning approach to strategy’ will not differ within the organizations in the manufacturing sector.

H 1.3: LSA dimension ‘Participative Policy making’ will not differ within the organizations in the manufacturing sector.

H 1.4: LSA dimension ‘Informating’ will not differ within the organizations in the manufacturing sector.

H 1.5: LSA dimension ‘Formative Accounting and Control’ will not differ within the organizations in the manufacturing sector.

H 1.6: LSA dimension ‘Internal exchange’ will not differ within the organizations in the manufacturing sector.

H 1.7: LSA dimension ‘Reward Flexibility’ will not differ within the organizations in the manufacturing sector.

H 1.8: LSA dimension ‘Enabling structures’ will not differ within the organizations in the manufacturing sector.

H 1.9: LSA dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the manufacturing sector.

H 1.10: LSA dimension ‘Inter Company learning’ will not differ within the organizations in the manufacturing sector.
H 1.11: LSA dimension ‘A learning climate’ will not differ within the organizations in the manufacturing sector.

H 1.12: LSA dimension ‘Self development opportunities for all’ will not differ within the organizations in the manufacturing sector.

H 2: Learning score (LSA) as well as its dimensions will not differ within the organizations in the telecom sector.

H 2.1: Learning score (LSA) will not differ within the organizations in telecom sector.

H 2.2: LSA dimension ‘A learning approach to strategy’ will not differ within the organizations in the telecom sector.

H 2.3: LSA dimension ‘Participative Policy making’ will not differ within the organizations in the telecom sector.

H 2.4: LSA dimension ‘Informating’ will not differ within the organizations in the telecom sector.

H 2.5: LSA dimension ‘Formative Accounting and Control’ will not differ within the organizations in the telecom sector.

H 2.6: LSA dimension ‘Internal exchange’ will not differ within the organizations in the telecom sector.

H 2.7: LSA dimension ‘Reward Flexibility’ will not differ within the organizations in the telecom sector.

H 2.8: LSA dimension ‘Enabling structures’ will not differ within the organizations in the telecom sector.
H 2.9: LSA dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the telecom sector.

H 2.10: LSA dimension ‘Inter Company learning’ will not differ within the organizations in the telecom sector.

H 2.11: LSA dimension ‘A learning climate’ will not differ within the organizations in the telecom sector.

H 2.12: LSA dimension ‘Self development opportunities for all’ will not differ within the organizations in the telecom sector.

H 3: Learning score (LSA) as well as its dimensions will not differ within the organizations in Information Technology (IT) sector.

H 3.1: Learning score (LSA) will not differ within the organizations in the IT sector.

H 3.2: LSA dimension ‘A learning approach to strategy’ will not differ within the organizations in the IT sector.

H 3.3: LSA dimension ‘Participative Policy making’ will not differ within the organizations in the IT sector.

H 3.4: LSA dimension ‘Informating’ will not differ within the organizations in the IT sector.

H 3.5: LSA dimension ‘Formative Accounting and Control’ will not differ within the organizations in the IT sector.

H 3.6: LSA dimension ‘Internal exchange’ will not differ within the organizations in the IT sector.
H 3.7: LSA dimension ‘Reward Flexibility’ will not differ within the organizations in the IT sector.

H 3.8: LSA dimension ‘Enabling structures’ will not differ within the organizations in the IT sector.

H 3.9: LSA dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the IT sector.

H 3.10: LSA dimension ‘Inter Company learning’ will not differ within the organizations in the IT sector.

H 3.11: LSA dimension ‘A learning climate’ will not differ within the organizations in the IT sector.

H 3.12: LSA dimension ‘Self development opportunities for all’ will not differ within the organizations in the IT sector.

H 4: Learning Dissatisfaction Score (LDS) as well as its dimensions will not differ within the organizations in the manufacturing sector.

H 4.1: LDS will not differ within the organizations in the manufacturing sector.

H 4.2: LDS dimension ‘A learning approach to strategy’ will not differ within the organizations in the manufacturing sector.

H 4.3: LDS dimension ‘Participative Policy making’ will not differ within the organizations in the manufacturing sector.

H 4.4: LDS dimension ‘Informating’ will not differ within the organizations in the manufacturing sector.
4.5: LDS dimension ‘Formative Accounting and Control’ will not differ within the organizations in the manufacturing sector.

4.6: LDS dimension ‘Internal exchange’ will not differ within the organizations in the manufacturing sector.

4.7: LDS dimension ‘Reward Flexibility’ will not differ within the organizations in the manufacturing sector.

4.8: LDS dimension ‘Enabling structures’ will not differ within the organizations in the manufacturing sector.

4.9: LDS dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the manufacturing sector.

4.10: LDS dimension ‘Inter Company learning’ will not differ within the organizations in the manufacturing sector.

4.11: LDS dimension ‘A learning climate’ will not differ within the organizations in the manufacturing sector.

4.12: LDS dimension ‘Self development opportunities for all’ will not differ within the organizations in the manufacturing sector.

H 5: Learning Dissatisfaction Score (LDS) as well as its dimensions will not differ within the organizations in the telecom sector.

H 5.1: LDS will not differ within the organizations in the telecom sector.

H 5.2: LDS dimension ‘A learning approach to strategy’ will not differ within the organizations in the telecom sector.
5.3: LDS dimension ‘Participative Policy making’ will not differ within the organizations in the telecom sector.

5.4: LDS dimension ‘Informating’ will not differ within the organizations in the telecom sector.

5.5: LDS dimension ‘Formative Accounting and Control’ will not differ within the organizations in the telecom sector.

5.6: LDS dimension ‘Internal exchange’ will not differ within the organizations in the telecom sector.

5.7: LDS dimension ‘Reward Flexibility’ will not differ within the organizations in the telecom sector.

5.8: LDS dimension ‘Enabling structures’ will not differ within the organizations in the telecom sector.

5.9: LDS dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the telecom sector.

5.10: LDS dimension ‘Inter Company learning’ will not differ within the organizations in the telecom sector.

5.11: LDS dimension ‘A learning climate’ will not differ within the organizations in the telecom sector.

5.12: LDS dimension ‘Self development opportunities for all’ will not differ within the organizations in the telecom sector.
I 6: Learning Dissatisfaction score (LDS) as well as its dimensions will not differ within the organizations in the Information Technology (IT) sector.

I 6.1: LDS will not differ within the organizations in the IT sector.

I 6.2: LDS dimension ‘A learning approach to strategy’ will not differ within the organizations in the IT sector.

I 6.3: LDS dimension ‘Participative Policy making’ will not differ within the organizations in the IT sector.

I 6.4: LDS dimension ‘Informating’ will not differ within the organizations in the IT sector.

I 6.5: LDS dimension ‘Formative Accounting and Control’ will not differ within the organizations in the IT sector.

I 6.6: LDS dimension ‘Internal exchange’ will not differ within the organizations in the IT sector.

I 6.7: LDS dimension ‘Reward Flexibility’ will not differ within the organizations in the IT sector.

I 6.8: LDS dimension ‘Enabling structures’ will not differ within the organizations in the IT sector.

I 6.9: LDS dimension ‘Boundary workers as environmental scanners’ will not differ within the organizations in the IT sector.

I 6.10: LDS dimension ‘Inter Company learning’ will not differ within the organizations in the IT sector.
H 6.11: LDS dimension ‘A learning climate’ will not differ within the organizations in the IT sector.

H 6.12: LDS dimension ‘Self development opportunities for all’ will not differ within the organizations in the IT sector.

H 7: **Individual competency (IC) as well as its dimensions will not differ within the organizations in the manufacturing sector.**

H 7.1: Individual competency score (IC) will not differ within the organizations in the manufacturing sector.

H 7.2: IC dimension ‘Intellectual competency’ will not differ within the organizations in the manufacturing sector.

H 7.3: IC dimension ‘People competency’ will not differ within the organizations in the manufacturing sector.

H 7.4: IC dimension ‘Self competency’ will not differ within the organizations in the manufacturing sector.

H 8: **Individual competency (IC) as well as its dimensions will not differ within the organizations in the telecom sector.**

H 8.1: Individual competency score (IC) will not differ within the organizations in the telecom sector.

H 8.2: IC dimension ‘Intellectual competency’ will not differ within the organizations in the telecom sector.

H 8.3: IC dimension ‘People competency’ will not differ within the organizations in the telecom sector.
H 8.4: IC dimension ‘Self competency’ will not differ within the organizations in the telecom sector.

H 9: Individual competency (IC) as well as its dimensions will not differ within the organizations in the IT sector.

H 9.1: Individual competency score (IC) will not differ within the organizations in the IT sector.

H 9.2: IC dimension ‘Intellectual competency’ will not differ within the organizations in the IT sector.

H 9.3: IC dimension ‘People competency’ will not differ within the organizations in the IT sector.

H 9.4: IC dimension ‘Self competency’ will not differ within the organizations in the IT sector.

H 10: Organization competency (OC) as well as its dimensions will not differ within the organizations in the manufacturing sector.

H 10.1: Organization competency score (OC) will not differ within the organizations in the manufacturing sector.

H 10.2: OC dimension ‘employee development competency’ will not differ within the organizations in the manufacturing sector.

H 10.3: OC dimension ‘product development competency’ will not differ within the organizations in the manufacturing sector.

H 10.4: OC dimension ‘quality and technology development competency’ will not differ within the organizations in the manufacturing sector.
H 11: Organization competency (OC) as well as its dimensions will not differ within the organizations in the telecom sector.

H 11.1: Organization competency score (OC) will not differ within the organizations in the telecom sector.

H 11.2: OC dimension ‘employee development competency’ will not differ within the organizations in the telecom sector.

H 11.3: OC dimension ‘product development competency’ will not differ within the organizations in the telecom sector.

H 11.4: OC dimension ‘quality and technology development competency’ will not differ within the organizations in the telecom sector.

H 12: Organization competency (OC) as well as its dimensions will not differ within the organizations in the IT sector.

H 12.1: Organization competency score (OC) will not differ within the organizations in the IT sector.

H 12.2: OC dimension ‘employee development competency’ will not differ within the organizations in the IT sector.

H 12.3: OC dimension ‘product development competency’ will not differ within the organizations in the IT sector.

H 12.4: OC dimension ‘quality and technology development competency’ will not differ within the organizations in the IT sector.
H 13: The dimensions of learning ‘as it is’ (LSA) will serve to significantly explain the variance in OC and its dimensions in the manufacturing, the telecom and the IT sectors.

H 13.1: The dimensions of learning (LSA) will serve to significantly explain the variance in OC score.

H 13.2: The dimensions of learning (LSA) will serve to significantly explain the variance in OC dimension ‘product development competency’.

H 13.3: The dimensions of learning (LSA) will serve to significantly explain the variance in OC dimension ‘employee development competency’.

H 13.4: The dimensions of learning (LSA) will serve to significantly explain the variance in OC dimension ‘quality and technology development competency’.

H 14: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in OC and its dimensions in the manufacturing, the telecom and the IT sectors.

H 14.1: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in OC score.

H 14.2: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in OC dimension ‘product development competency’.
14.3: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in OC dimension ‘employee development competency’.

14.4: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in OC dimension ‘quality and technology development competency’.

15: The dimensions of learning ‘as it is’ (LSA) will serve to significantly explain the variance in IC and its dimensions in the manufacturing, the telecom and the IT sectors.

15.1: The dimensions of learning (LSA) will serve to significantly explain the variance in IC score.

15.2: The dimensions of learning organization (LSA) will serve to significantly explain the variance in IC dimension ‘Intellectual competency’.

15.3: The dimensions of learning organization (LSA) will serve to significantly explain the variance in IC dimension ‘people competency’.

15.4: The dimensions of learning organization (LSA) will serve as significant predictors the variance in IC dimension ‘self competency’.

16: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in IC and its dimensions in the manufacturing, the telecom and the IT sectors.

16.1: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in IC score.
H 16.2: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in IC dimension ‘intellectual competency’.

H 16.3: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in IC dimension ‘people competency’.

H 16.4: The dimensions of learning dissatisfaction (LDS) will serve to significantly explain the variance in IC dimension ‘self competency’.

3.3 INSTRUMENTS USED

The survey is the most commonly used data collection method for quantitative research, and it is used when the purpose of the research is to generate findings from a proportion of the population so that generalizations can be made about the behaviour, attitudes and / or opinions of the whole population from which the population is drawn (McCormack and Hill, 1997). By keeping in mind the research problem and objectives, the author has chosen the survey method to collect the data. As questionnaires are used in survey method to generate data, the following instruments are selected and used in this study.

3.3.1 LEARNING COMPANY QUESTIONNAIRE (LCQ)

LCQ was developed by Pedler (1992). It visualizes learning organization based on following 11 characteristics: a learning approach to strategy, participative Policy making, informing, formative accounting and control, internal exchange, reward
flexibility, enabling structures, boundary workers as environmental scanners, intercompany learning, a learning climate, self development opportunities for all. Each dimension has two scores. One side the score is “as it is” (LSA) which describes the present situation in the organization and the other side is “As you would like it to be” (LSB) which describes the employees preference about that situation. The difference of both these scores give the learning dissatisfaction score (LDS). It consists of 55 Items and adopts 7 point rating scale anchored from ‘never followed’ to ‘always followed’ and the responses to items are scored from 1 to 7 respectively.

The author of LCQ has wide experience in the area of learning organization and is director of ‘Learning Company’, Sheffield in United Kingdom. The author has established the reliability and validity of this instrument. However this instrument is pretested to establish its reliability and validity.

3.3.2 ORGANIZATION COMPETENCY QUESTIONNAIRE

The organization competency questionnaire was developed by Chaston, Badges, Mangles and Smith (2001). It measures the degree of organizations ability to effectively manage the various aspects of internal operations. It has 25 items and 7 point response ranging from ‘strongly agree’ to ‘strongly disagree’, with the responses scored from 7 to 1.
3.3.3 INDIVIDUAL COMPETENCY EVALUATION QUESTIONNAIRE

The researcher of this study developed this instrument. It consists of the following 3 dimensions of Individual Competency: Intellectual competency, People competency and Self-competency. It has 39 items and adopts a 7-point scale anchored from 'All the time' to 'Never' and the responses to items are scored from 7 to 1 respectively. This questionnaire measures Individual competency by asking the respondent 'how much time the items match with their work life'. The individual competency score is computed by adding the scores of all dimensions.

3.4 DEVELOPMENT OF INDIVIDUAL COMPETENCY EVALUATION QUESTIONNAIRE

Individual competency is studied by researchers in different manifestation some use the term personal competency while others call it managerial competency. Klemp (1980), Hay (1990) and Spencer (1993) described competency as the characteristics of the person, which results in superior job performance. Some authors (Boyatzis, 1982, Bratton 1998 & Hunt and Meech, 1999) expands this definition to include skill and knowledge.

After reviewing the literature it was decided to develop an instrument to measure Individual competency in terms of characteristics and skill.
Whidett & Hollyforde (1999) in their sample competency framework have given following competencies:

a) Working with people: managing working with information relationship, team working and influencing.

b) Working with information: gathering and analyzing information, decision-making.

c) Developing the business: personal development, generating and building on ideas.

d) Achieving results: planning, deadline management and objective setting.

Unilever (www. Unilever.com.) has used these competencies for self-assessment of individual competency.

a) Intellectual competence: critical thinking, problem solving, creativity, decision-making, planning and organizing.

b) People competence: Team work, relationship building, leadership, influencing and flexibility,

c) Seizing results: self-confidence, drive, change orientation, developing self and integrity.

d) Business Focus: Commercial orientations, technological awareness, risk taking and organizational awareness.
It was decided to synthesize the dimensions given in Whidett & Hollyforde (1999) sample competency framework and Unilever’s competencies in a phased manner to develop an instrument to measure individual competency.

Phase I Referring to a Panel: A panel of 4 experienced people from the areas of training, HRD, academics, business consulting and psychology was formed. The list of skills and behavior was given to them individually. Separate discussions were held with each of them duly explaining intended meaning and the context of each skill and behavior selected in the first phase. It was decided to consider only those competencies, which are essential for individual competency common to all the departments in an organization. The list included: working with information, decision making, creativity, planning and organization, team working, managing relationship, influencing, flexibility, self confidence, integrity, change orientation, drive and seizing result. These items were factorized into three dimensions: Intellectual competency, people competency and self-competency.

Phase II Preliminary questionnaire: Based on the sample competency framework developed by Whiddett & Hollyfordge(1999) and the discussions held with experts, totally 60 items were developed with 20 items each for the three dimensions. The lists of these items along with the dimensions were scrutinized by 4 HR managers against context, clarity and understandability. After detailed discussions with them 39 items were selected i.e. 12 items each for Intellectual and people competency and 15 items for self competency and this instrument is named ‘Individual competency evaluating questionnaire’ (ICEQ).
3.5 DEFINITIONS FOR THE DIMENSIONS OF INDIVIDUAL COMPETENCY

Intellectual Competency: It includes the following skills:

a) Working with information: With the advent of new technology an unimaginable quantity of information is flowing into the organization. Now it is very important that employees should be able to make their way through files of irrelevant information to get the one ‘nugget’ that is critical to their needs. This competency includes the ability of a person to use, maintain and establish accuracy and relevance of information.

b) Decision-making: In the organization taking the right decision at the right time is very important. This competency includes the ability of a person to take responsibility to make decision and to analyse and anticipate possible consequences of potential decision.

c) Creativity: It is the ability to discover, create and envision imaginative and unique ideas. It includes looking at situations from multiple perspectives to create radically new concepts. In an organization there must be generation of ideas to develop those ideas into solution.

d) Planning and organizing: It is the ability to establish a systematic course of action to achieve a task or objective effectively and efficiently. It involves planning, prioritizing, scheduling, coordinating
and the monitoring of performance against objectives. In an organization it is essential to make plans to meet departmental objectives and to convert organizational plans into departmental plans

**People Competency**

a) **Team Working:** It is the ability to work cooperatively with others to achieve shared goals, support other people’s performance to achieve the best possible results and showing. Teamwork and teambuilding play a very important role in the successful functioning of an organization.

b) **Managing Relationships:** It is the ability to create positive and mutually rewarding relationships with people at all levels. It includes maintaining and strengthening existing relationships with others, comfortably and effortlessly. In the changing scenario relationship has to be build both internally as well as externally with contacts who can contribute to the business.

c) **Influencing:** It is the ability to influence or changing other people’s attitudes or opinions by expressing a viewpoint with assurance, certainty and conviction, using appropriate interpersonal styles and communication methods to gain acceptance and build commitment to ideas, proposals or plans. It has become essential to influence and change the thinking of others by using appropriate ways of
communication and to approach negotiations with the objective of achieving a win-win outcome.

d) Flexibility: It is the ability to adapt and able to handle a variety of situations and demands; modifying one’s approach as the requirements of the situation changes. Now a days the employees has to adjust effectively to work within new work structures or processes.

Self Competency

a) Self Confidence: It is the ability to demonstrate independence, self-reliance and a realistic confidence in one’s own ability to accomplish a task or to solve problems. One should take responsibility to make sound decisions when presented with challenging circumstances.

b) Integrity: It is a ability to display high personal and professional standards of integrity and behaviour. It is must to apply the same values of integrity to self as applied to others and fulfill commitment and promises.

c) Change Orientation: It is the ability to actively promote better ways of doing things. Seeing change as an opportunity to create improvement, growth and advancement for all concerned. In this competitive an changing environment it is important to focus on the beneficial aspects of change.
d) Drive: The ability to radiate the personal drive, motivation and energy to go the extra mile in delivering excellent performance. The employees have to constantly search for opportunities to push the boundaries to deliver results beyond expectations.

e) Seizing Results: It is the ability to take calculated risks to obtain benefits and to ensure that commitments are met.

3.6 PILOT QUESTIONNAIRE

The pilot questionnaire (refer Appendix 1) consisted of all the three instruments mentioned. It has 4 sections. Section 1 consists of learning company questionnaire comprising of 55 items. Section 2 consists of organization competency comprising of 25 items and section 3 consists of ICEQ comprising 39 items and the last section was intended to collect the Bio-data of the respondents. Before administrating the questionnaire it was given to a panel comprising six experts (two from the manufacturing sector and two from the IT sector and two from the telecom Sector) to check its adaptability to Indian conditions. They screened the questionnaire for redundancy, limited relevancy, and difficulty in understanding in the Indian context. After discussions with the expert panel it was decided to keep the name in the bio-data as optional.
3.7 PILOT STUDY

The purpose of a pilot study was to examine the reliability and validity of an instrument on a limited number of people from the sample target population. With the help of pilot study the weakness in design of instrumentation can be detected before it was administered to the chosen sample. Conducting the pilot study helped to check whether the instructions were clear and understandable, and to eliminate any ambiguity or lack of clarity in the question wording. The pilot study reveals whether respondents are using all the options for a given set of questions or whether the choice needs to be narrowed down (McCormack and Hill, 1997).

A pilot study was conducted prior to the main study using the pilot questionnaire. The data collected through the pilot study were statistically analyzed to establish the reliability and validity of the instruments used in the main study. The pilot study was conducted in Rane Madras Ltd (RML). It is a firm manufacturing of steering gears and linkages. It is the only company, which supplies to the entire range of Auto Industry – HCV, LCV, UV, Tractors and Passenger cars. It is certified as ISO 9001 and is now gearing towards ISO/TS16949. RML meets in excess of 50% of the demand generated in India alone. It supplies Original Equipment Spares to tractor manufacturers in the U.K and U.S.A. Products from Rane (Madras) also cater to the requirements of the replacement market in Sri Lanka, Indonesia and Middle East.

A sample of 29 executives working in the organization was selected. The executives were administered the questionnaire and the researcher of the
study was present there during this period for any clarifications. The average time taken by the respondents to complete the questionnaire was 45 minutes. It was found that the participants did not express any difficulty in understanding and responding to the questionnaire. The internal consistency reliability measured by Cronbach’s coefficient alpha for the measures was found to be adequate. Hence it was decided to proceed with the main study.

3.8 MAIN STUDY

The main study was conducted in six organizations; two each from the manufacturing, the telecom and the IT sector in geographical region of Chennai.

3.8.1 SAMPLING METHOD

The list of organizations operating in Chennai (State Capital of Tamil Nadu, India) was obtained from Confederation of Indian Industry and Madras Management Association, Chennai. Five organizations each from the Manufacturing sector and Information Technology (IT) sector and Telecom sector were randomly selected for the study. The researcher personally approached each of these organizations, briefed them about the research study and sought their willingness to participate in the study to enable the researcher to collect data. Finally two organizations from the manufacturing sector, two organizations from the IT sector and two from telecom sector participated in the study.

As it was agreed to keep the names of the participating organizations confidential, the organizations from manufacturing sector are named as MAN 1
and MAN 2, the organizations from IT sector are named as IT 1 and IT 2 and from telecom sector as TEL 1 and TEL 2. From now onwards the organizations are identified with these names throughout the study.

A senior executive was nominated by the management from each of the participating organizations to coordinate with researcher in collecting the data. Detailed discussions were held separately with all the coordinators and the following guidelines were set for collecting data:

a. The respondents were selected randomly from among those working with the same organization for a minimum period of 1 year to ensure homogeneity.

b. The maximum age of respondents was limited to 50 years to maintain homogeneity.

c. The minimum educational qualification was an engineering diploma or a degree from any field.

d. While choosing respondents, care was taken to represent all the functional areas so that the sample can be considered as truly representative of the population.

3.8.2 THE PROFILE OF ORGANIZATIONS

The salient features of the participating organizations are mentioned below:

a) All the six organizations are privately managed organizations.
b) Both the manufacturing organizations are in automobile manufacturing sector MAN1 is an Indian organization and MAN2 is a Korean based organization.

c) Both the IT sector organizations are connected with business process outsourcing (BPO) related activities. IT 1 is an Indian organization and IT 2 is a UK based organization.

d) Both the telecom sector organizations are Indian organizations. TEL1 provides mobile cell phone services, while TEL 2 provides landline services.

**MAN 1**

It is an automobile industry with a major presence in India's commercial vehicle industry. It was the first to introduce full-air brakes, multiaxled trucks, CNG buses and a host of innovations in buses. Its product range constitutes the largest range of commercial vehicles with trucks from 7.5T GVW to 125T GVW, buses from 19 to 80 seaters, a host of special application vehicles including fire fighters doing duty at international airports and diesel engines for industrial, genset and marine applications. Committed to Total Quality Management, It is the country's first automotive manufacturer to obtain the coveted ISO 9002 certificate followed by the more comprehensive ISO 9001: 1994 certification and in 1998, the latest version of QS 9000.
MAN 2
It is a Korean based car manufacturing company with its plant in Chennai, which started in December 1996. Constructed at a total cost of $614 million, the plant was built in record 17 months, with the pilot production beginning in May 1998. The plant is a complete manufacturing unit in itself and has facilities such as press shop, body shop, assembly line, and paint shop. It also has manufacturing facilities for critical components such as engine and transmission, aluminum foundry to manufacture aluminum cylinder heads for the engines, as well as a plastic extrusion unit to manufacture high-precision parts. The plant has installed cutting edge manufacturing practices to give the consumer technologically the most advanced cars in the world. The production lines are flexible, capable of producing more than one model.

IT 1
It is a software development firm, which is a global solutions specialist with a dedicated focus on the banking financial services and insurance vertical. It has a unique business mix comprising products, solution and building components, IT services and the business process services. World’s largest banking and financial services conglomerate citigroup and the world’s biggest insurance conglomerate AIG are amongst their most prestigious relationships. A world’s leading research agency has given their organization as the Indian vendor with highest banking domain specialist. They have established world’s first core banking solutions based on distributed architecture, world’s first comprehensive credit cards solution
based on distributed architecture, world’s first full service branchless retail consumes banking from a kiosk/ATM and world’s largest corporeity banking portal where cash management trade and treasury converge. Its services include application development re-engineering, maintenance, solution integration and deployment. Its products include service oriented architecture smart build, J2EE/open API. Its BPO includes customers, interactive services, credit card processing, transaction services, and business infrastructure services

**IT 2**

It is a UK based $ 800 million It services and business process company. Its technology and process center in Chennai is for creating and delivering business process and technology solutions to global clients. It has software campuses – cum development center in Noida and they are setting one more in Pune. Their main services are business and technology consulting, IT services, IT outsourcing, Business Process outsourcing, and Finance & Accounting outsourcing. It operates across all major business sectors, with dedicated divisions in banking, insurance, public sector, retail, telecom and utilities.

**TEL 1**

It's an infocom company, which was commissioned in 2002. It built the backbone for a digital India – 60,000 kms of fiber optic backbone, crisscrossing the entire country. Its vision is to herald a digital revolution in India by bringing affordable means of information and communication to the doorsteps of India’s vast population. Its network is a pan India, high capacity, integrated (Wireless and
Wire line) and convergent (Voice, Data and Video) digital network, designed to offer services that span the entire infocomm value chain – infrastructure, services, for enterprises and individuals, applications and consulting. It offers a complete range of telecom services, covering mobile and fixed line telephony including broadband, national and international long distance services, data services and a wide range of value added services and applications.

**TEL 2**

It comes from a corporate group which is India’s leading private sector, provider of telecommunications services with a strong customer base consisting of 7.14 million total customers, which constitute, 6.5 million mobile and 6,37,000 fixed line customers. The enterprise’s current business includes mobile services, fixed line National and international long distance services, VSAT, Internet services and network solutions. This firm offers telephony-encompassing data, Internet, broadband and long distance data services. Their objective is “To capitalize on the growth opportunities that the Company believes are available in the Indian telecommunications market and consolidate its position to be the leading integrated telecommunications services provider in key markets in India, with a focus on providing mobile services”.

**3.8.3 DATA COLLECTION PROCEDURE**

As the employees in an organization are stratified based on the functional areas, stratified random sampling method is adopted to collect data from the respondents
to ensure that the sample is truly representative of the population and to avoid sampling bias. A letter, which explains the purpose of the research study, was enclosed along with each questionnaire. The questionnaires were handed over to the coordinators of all the six organizations that participated in the study. They in-turn distributed the questionnaires to the respondents with an advice to self–administer the questionnaires. It was requested that questionnaire be filled at a stretch. They were also advised to return the filled in questionnaires to the coordinators in sealed covers.

As a follow up action, the researcher regularly visited the participating companies once in three days. The coordinators and respondents were contacted and offered support / clarifications if needed by them. It was assessed that the respondents took 40-45 minutes to fill in the questionnaire. The researcher collected the filled in questionnaires from the coordinators in sealed covers in small lots. There were totally 600 questionnaires distributed and 520 filled in valid questionnaires were received back and used in the study, thus getting a 86% rate of return. It took nine months to complete the final study in six organizations.
3.8.4 DATA ANALYSIS PROCEDURE

The survey – research data collected was computer analyzed employing the SPSS package (Version 11). The research focused on the following variables as they form the dimensions of learning organization, individual and organization competency.

1. Learning score and learning dissatisfaction score, whose dimensions are:
   (i) A learning approach to strategy (ii) Participative Policymaking
   (iii) Informating (iv) Formative Accounting and Control (v) Internal Exchange
   (vi) Reward Flexibility (vii) Enabling structures (viii) Boundary Workers as
   Environmental Scanners (ix) Intercompany Learning (x) A Learning Climate
   (xi) Self Development Opportunities for all.

2. Individual competency, whose dimensions are: (i) Intellectual Competency
   (ii) People Competency (iii) Self Competency

3. Organization Competency, whose dimensions are: (i) Product Development
   (ii) Employee Development (iii) Quality and Technology Development.

   The relationship among the above-mentioned variables was studied at length as hypothesised to find a logical answer to the research problem and to fulfill the research objectives.
3.8.5 THE TESTS EMPLOYED

The statistical tests employed to check the validity and reliability of the instruments used and to test the hypotheses were as follows:

a) **Factor analysis:** The scores from learning company questionnaire (LCQ), individual competency evaluation questionnaire (ICEQ) and organization competency questionnaire (OCQ) were factor analyzed by using the data collected from the field. The principal components method with varimax rotation was used for LCQ and OCQ. Confirmatory factor analysis was used for ICEQ. These tests were conducted to identify the latent structure that form into dimensions.

b) **Reliability analysis:** Cronbach’s coefficient of reliability was computed for all dimensions to verify the internal consistency of the items that constitute the dimensions.

c) **T – Tests:** The Mean scores for all the dimensions of learning organization IC and OC were computed. T – tests were conducted to check whether significant differences exist within the scores of manufacturing, telecom and IT sectors.

d) **Multiple Regression Analysis:** In order to predict the levels of IC and OC as a function of LS and LDS, step-wise Multiple Regression Analyses were conducted organization-wise by using dimensions of IC and OC as dependent variables, and the dimensions of LS and LDS as independent variables.