CHAPTER IV

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4.0 INTRODUCTION

Methodology in a report provides a description of the methods and techniques employed in the investigation. It presents the details of the procedure, size of sample, method of sample selection, choice of variables, tests of measurement and statistical analyses.

4.1 GENERAL OBJECTIVES

Considering the statement of the problem and significance of the present study, the following general objectives were arrived at.

1. To develop and standardize the tools for assessing language skills (Listening & Reading) of engineering college students.
2. To identify, adopt and standardize the tools for assessing the socio-pedagogical factors of engineering college students.
3. To study the influence of socio-pedagogical factors on language skills of engineering college students.

4.2 SPECIFIC OBJECTIVES

Based on the general objectives of the study of socio-pedagogical factors affecting language skills, the following specific objectives were deduced to find out

1. The relationship among language skills, language aptitude and verbal intelligence of the selected engineering college students,
2. The differential language groups of selected engineering college students,
3. The influence of socio-economic factors on language skills of the selected engineering college students,
4. The influence of family and college environment on language skills of the selected engineering college students,

5. The influence of personality traits on language skills of the selected engineering college students, and

6. The influence of pedagogical factors such as study habits, locus of control, learning approaches, learning styles, and learners’ effectiveness on language skills of the selected engineering college students.

4.3.0 HYPOTHESES

4.3.1 GENERAL HYPOTHESES

Considering the specific objectives of the study, the following general hypotheses were spelled out.

1. There will be a mean score difference in personality traits and social factors such as socio-economic status, family environment and college environment between the groups who possess differential language skills among the selected engineering college students.

2. There will be a mean score difference in pedagogical factors such as study habits, locus of control, learning styles, learning approaches and learners’ effectiveness between the groups who possess differential language skills among the selected engineering college students.

4.3.2 SPECIFIC HYPOTHESES

Based on the General Hypotheses, the following specific hypotheses were generated.

1. There will be a significant mean score difference in Socio-Economic Status between the groups who possess differential language skills among the selected Engineering Students.

2. There will be a significant mean score difference in Cohesion (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.
3. There will be a significant mean score difference in Expressiveness (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

4. There will be a significant mean score difference in Conflict (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

5. There will be a significant mean score difference in Acceptance and Caring (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

6. There will be a significant mean score difference in Independence (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

7. There will be a significant mean score difference in Active-recreational orientation (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

8. There will be a significant mean score difference in Organization (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

9. There will be a significant mean score difference in Control (Family Environment) between the groups who possess differential language skills among the selected Engineering Students.

10. There will be a significant mean score difference in Family Environment (General) between the groups who possess differential language skills among the selected Engineering Students.

11. There will be a significant mean score difference in Campus Environment (College Environment) between the groups who possess differential language skills among the selected Engineering Students.

12. There will be a significant mean score difference in Managerial Environment (College Environment) between the groups who possess differential language skills among the selected Engineering Students.

13. There will be a significant mean score difference in Academic Environment (College Environment) between the groups who possess differential language skills among the selected Engineering Students.
14. There will be a significant mean score difference in Peer Group Environment (College Environment) between the groups who possess differential language skills among the selected Engineering Students.

15. There will be a significant mean score difference in Faculty Environment (College Environment) between the groups who possess differential language skills among the selected Engineering Students.

16. There will be a significant mean score difference in College Environment (General) between the groups who possess differential language skills among the selected Engineering Students.

17. There will be a significant mean score difference in Self-confidence (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

18. There will be a significant mean score difference in Persistence (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

19. There will be a significant mean score difference in Co-operativeness (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

20. There will be a significant mean score difference in Emotional Stability (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

21. There will be a significant mean score difference in Emotional Control (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

22. There will be a significant mean score difference in Sense of Responsibility (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

23. There will be a significant mean score difference in Courtesy (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.
24. There will be a significant mean score difference in Sociability (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

25. There will be a significant mean score difference in Leadership (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

26. There will be a significant mean score difference in Initiative (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

27. There will be a significant mean score difference in Attitude towards life (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

28. There will be a significant mean score difference in Attitude towards self (Personality Traits) between the groups who possess differential language skills among the selected Engineering Students.

29. There will be a significant mean score difference in Home environment and Planning of work (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

30. There will be a significant mean score difference in Reading and Note taking (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

31. There will be a significant mean score difference in Planning of Subjects (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

32. There will be a significant mean score difference in Habits of Concentration (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

33. There will be a significant mean score difference in Preparation for Examination (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

34. There will be a significant mean score difference in General Habits and Attitudes (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.
35. There will be a significant mean score difference in College Environment (Study Habits) between the groups who possess differential language skills among the selected Engineering Students.

36. There will be a significant mean score difference in Study Habits (General) between the groups who possess differential language skills among the selected Engineering Students.

37. There will be a significant mean score difference in Locus of Control between the groups who possess differential language skills among the selected Engineering Students.

38. There will be a significant mean score difference in Independent (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

39. There will be a significant mean score difference in Avoidant (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

40. There will be a significant mean score difference in Collaborative (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

41. There will be a significant mean score difference in Dependent (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

42. There will be a significant mean score difference in Competitive (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

43. There will be a significant mean score difference in Participative (Students' Learning Style) between the groups who possess differential language skills among the selected Engineering Students.

44. There will be a significant mean score difference in Students' Learning Style (General) between the groups who possess differential language skills among the selected Engineering Students.

45. There will be a significant mean score difference in Learning for Achievement (Approaches to Learning) between the groups who possess differential language skills among the selected Engineering Students.
46. There will be a significant mean score difference in Learning for Reproduction (Approaches to Learning) between the groups who possess differential language skills among the selected Engineering Students.

47. There will be a significant mean score difference in Meaningful Learning (Approaches to Learning) between the groups who possess differential language skills among the selected Engineering Students.

48. There will be a significant mean score difference in Learning Approaches (General) between the groups who possess differential language skills among the selected Engineering Students.

49. There will be a significant mean score difference in Motivation to learn (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

50. There will be a significant mean score difference in Interest in learning (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

51. There will be a significant mean score difference in Attitude towards learning (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

52. There will be a significant mean score difference in Learning goals defined (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

53. There will be a significant mean score difference in Attention (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

54. There will be a significant mean score difference in Discipline (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

55. There will be a significant mean score difference in Perseverance (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.
56. There will be a significant mean score difference in Memory (Learners’ Effectiveness) between the groups who possess differential language skills among the selected Engineering Students.

57. There will be a significant mean score difference in Learners’ Effectiveness (General) between the groups who possess differential language skills among the selected Engineering Students.

4.4.0 OPERATIONAL DEFINITION OF THE TERMS

The operational definitions of the terms used in the present study are presented.

4.4.1 SOCIO – PEDAGOGICAL FACTORS

Social factors refer to social status and economic status. Social status indicates one’s rank, position and respect in the society. Economic status includes parents’ income, occupation and level of education. Pedagogical factors refer to the principles and practices of learning process.

In the present study, the personality traits, socio – economic aspects, family environment, college environment, study habits, locus of control, learning styles, learning approaches and learners’ effectiveness are considered as socio – pedagogical factors. Among these variables, the personality traits, socio – economic status, family and college environment are social factors and rest of the variables such as study habits, locus of control, learning styles, learning approaches and learners’ effectiveness are pedagogical factors.

4.4.2 LANGUAGE SKILLS

Language skills, in general, refers to the receptive (Listening & reading) and productive (speaking & writing) skills. In the present study, the investigator considered listening and reading for assessing the receptive skills, and verbal intelligence and language aptitude (spelling & error) for assessing the productive skills since these productive skills facilitate the individual in speaking and writing.
4.4.3 SOCIAL FACTORS

Social factors refer to socio-economic status, family environment, college environment, and personality traits of the respondents. Socio-economic status of the individual encompasses the levels of cultural rank and degree of financial independence. Social class and personality of a person help to account for the individual difference among the students, and therefore determinants of individual differences in behavior, learning and achievement. Since social class has been a useful consistent independent measure, this variable is considered for assessing the learners’ socio-economic status.

4.4.4 FAMILY ENVIRONMENT

The home environment is a determinant of children’s language development as it affects the communicative environment in which they are brought up. Parental level of education and occupational status decide the nature of home background which either promotes or hinders the learning process. Family environmental scale assesses the sub-dimensions such as cohesion, expressiveness, conflict, acceptance and caring, independence, active recreational orientation, organization and control.

4.4.5 COLLEGE ENVIRONMENT

The college environment refers to the environmental characteristics such as the locality of the campus and physical facilities such as classrooms, library, laboratory and playground. The relationship between the management and the students, the nature of course content, teaching technology, evaluation system, and opportunities provided for curricular and co-curricular activities are some of the factors considered for assessment. The college environment scale also assesses the student – teacher and peer group interaction which is expected to influence greatly the language learning skills.
4.4.6 PERSONALITY TRAITS

Differences between individuals affect teaching learning process. Basic personality dispositions influence language development. Personality traits such as self-confidence, persistence, co-operativeness, emotional stability and control, sense of responsibility, courtesy, sociability, leadership, initiative and attitude to life and self are believed to influence the learning process.

4.4.7 LOCUS OF CONTROL

Locus of control, a relatively stable trait, refers to the individual’s generalized belief regarding the contingency of reinforcement (Rotter, 1966). Internal locus of control refers to the belief that outcomes are contingent on one’s own behavior or on a personal characteristic, such as ability. The external control refers to the belief that outcomes are caused by factors beyond individual’s control, such as luck. Learners who believe positive outcomes to be contingent on their own behaviors have relatively high internal scores on the success subscale, while learners who think that negative outcomes are contingent on their own behaviors have relatively high internal scores on the failure subscale. Hence, thoughts and feelings are important factors in understanding achievement behavior.

4.4.8 STUDY HABITS

Study habit refers to the learning strategy adopted by the learners to achieve the learning goals. Factors such as motivation, personality, attitude, home and college environment are expected to influence the study habits. Reading and note taking, planning of subjects, preparation for examination and habits of concentration are some of the dimensions considered for the study.

4.4.9 LEARNERS' EFFECTIVENESS

Learners’ effectiveness refers to the capacity of the learner to realize the objectives and goals of learning and one or more abilities of a learner to produce a set of changes in learners’ behavior. Learners’ effectiveness deals with the characteristics of learners such as motivation, interest, attitude,
learning goals, attention and memory and their effects on the educational outcome.

4.4.10 LEARNING APPROACHES

Learning approaches refer to the philosophical inclination of the learner. The three most commonly used broad approaches to learning are reproducing learning or surface approach, achievement learning or strategic approach and meaningful learning or deep approach.

4.4.11 LEARNING STYLE

A learning style is the unique collection of individual skills and preferences that affect a person’s perception and ways of processing information. Identifying one’s learning style would help a learner increase his motivation and effectiveness of learning. The learning styles considered in the study are independent, dependent, participative, collaborative, avoidant and competitive learning.

4.5 SURVEY DESIGN

Based on the objectives, hypotheses and logistics of the study, the investigator adopted survey research design for generating primary data.

A survey is a form of planned collection of data for the purpose of description or prediction as a guide to action or for the purpose of analysis of the relationships between certain variables (Babbie, 1973) and surveys are usually conducted on a fairly large scale.

The two types of survey are the descriptive, enumerative, census type of survey and the analytic, relational type of survey. The descriptive survey is used for enumeration and also for fact – finding although it should be added that data thus collected are often used to make predictions, for instance, by comparing the results of surveys at different times. The other, the analytic, relational survey is used to explore the relationship between variables. It is less oriented towards representativeness and more towards finding associations and
explanations, less towards description and more towards prediction, less likely to ask "how many" than "why" and "what" goes with "what". It is usually adopted to explore specific hypotheses (Oppenheim, 1970). Survey methods can also provide a "search" device when the researcher is only beginning his inquiry into a particular topic. This is usually called an exploratory study (Babbie, 1973).

Based on the above, descriptive sample survey research design was selected for the study. The objectives of the survey are to describe, explain and compare language skills of the engineering college students with that of the socio-pedagogical factors.

4.6 STUDY AREA AND POPULATION OF THE PRESENT STUDY

Tamilnadu Higher education offers two types of academic programmes: professional and liberal arts and science. The affiliated colleges and University Departments offer UG and PG courses in these academic programmes. Among these courses offered by the Universities and Colleges, the study considered UG Engineering course as a population for the present study. In Tamilnadu, 230 Colleges offer Engineering course (UG level). Of the various disciplines such as Civil Engineering, Mechanical Engineering, Electrical and Electronics Engineering, Computer Science Engineering, Information Technology, Mechatronics, Electronics and Communication Engineering, Textile Technology, Leather Technology, Automobile Engineering, Marine Engineering and Aeronautic Engineering, the disciplines CSE, ECE and IT were selected for the study since these courses are well received by students as well as parents due to job opportunities available in India and around the globe. Further, most of the Engineering Colleges in Tamilnadu offer these three courses.

The State of Tamilnadu consists of 29 revenue districts for administrative purposes. The present study selected Coimbatore revenue
district as a study area, since the Coimbatore district is an Industrial city and a good number of colleges have modern technological facilities to train the Engineering students. The Coimbatore district has 14 Engineering Colleges which include 1 Government College, 2 Aided Colleges and 11 unaided self-financing colleges. Among these colleges, one government aided college and one self-financing college with good infrastructure facilities, were selected for the study. The courses offered by these colleges are as follows: Civil Engineering (CE), Mechanical Engineering (ME), Electrical and Electronics Engineering (EEE), Electronics and Communication Engineering (ECE), Computer Science and Engineering (CSE), Automobile Engineering (AE), Apparel & Fashion Technology (AFT), and Information Technology (IT). From the above courses, as decided earlier, the first year students of ECE, CSE and IT were considered for the study.

4.7 SAMPLES FOR THE PRESENT STUDY

For the present study, the investigator selected the First year Under Graduate students of ECE, CSE and IT as samples from PSG College of Technology (Govt., aided College) and Sri Krishna College of Engineering and Technology (unaided self-financing College), Coimbatore. In PSG College of Technology, the class strength is 60 in each discipline viz., ECE, CSE and IT and in Sri Krishna College of Engineering and Technology, the class strength is 90 in each discipline. For the present investigation, 30 percent of the students were randomly selected as sample from these courses. Thus, at the second stage of sampling, 81 students from Sri Krishna College of Engineering and Technology and 54 students from PSG College of Technology and totally 135 students were considered as samples for this study. The following table presents the details of the sample selection.
### 4.8.0 VARIABLES FOR THE PRESENT STUDY

Considering the objectives and hypotheses of the present study, the following variables were identified.

#### 4.8.1 INDEPENDENT VARIABLES

**Socio-Pedagogical Variables**

1. Socio-Economic Status
2. Family Environment
3. College Environment
4. Personality Traits
5. Locus of Control
6. Study Habits
7. Learners’ Effectiveness
8. Learning Approaches
9. Learning Styles

#### 4.8.2 DEPENDENT VARIABLES

**Language Skills**

1. Listening Skills
2. Reading Skills
3. Language Aptitude
4. Verbal Intelligence
4.9 TOOLS USED FOR THE PRESENT STUDY

For the present investigation, the following tools (Vide Appendices) were adopted and developed and validated by the investigator for generation of data.

1. Computer Assisted Language Skills Assessment Package (CALSAP) developed and validated by the investigator.
2. Language Aptitude Test (Spelling) (DAT)
3. Language Aptitude Test (Error) (DAT)
4. Group test of Intelligence in English (Verbal) (Developed and standardized by Dr. Mrs. Ahuja).
5. Socio-Economic Status Scale (adopted from Bhardraj & Gupta)
6. Family Environment Scale (adopted from Bhatia & Chadha)
7. College Environment Scale (adopted from Arokiadoss)
8. Study Habits inventory (adopted from Patel)
9. Learning styles Questionnaire (adopted from Grasha & Reichman)
10. Learners’ Effectiveness Questionnaire (adopted from Arokiadoss)
11. Lancaster’s Approaches to Learning Questionnaire (adopted from Paul Ramsden)
12. Personality Traits Scale (adopted from Cattell)
13. Locus of Control Questionnaire (adopted from Crandall).

4.10.0 DESCRIPTION OF THE TOOLS

4.10.1 COMPUTER ASSISTED LANGUAGE SKILLS ASSESSMENT PACKAGE

The material for Computer Assisted Language Skills Assessment Package (CALSAP) was prepared after a thorough identification of the participants, analysis of their communicative needs, and review of the course material used in engineering colleges. The investigator selected three passages for listening and one for reading to measure the receptive skills of the first year engineering college students. The questions related to the passages were of
objective type like multiple choice, true or false, matching words with their meanings, identifying single words and filling up the summary of the passage with the right words chosen from the list of words.

The description of the questions and the number of items for each passage in the listening skills assessment package are presented below.

<table>
<thead>
<tr>
<th>Passage No.</th>
<th>Question Type</th>
<th>No. of Items</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>True or false</td>
<td>6</td>
<td>20 mts.</td>
</tr>
<tr>
<td></td>
<td>Fill ups</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Multiple choice</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>True or false</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiple choice</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total no. of items 28</td>
</tr>
</tbody>
</table>

The Reading skills assessment package consists of one passage of about 1500 words. The description of the questions, the number of items and the time allotted for reading and answering are presented below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Question Type</th>
<th>No. of Items</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>True or False</td>
<td>10</td>
<td>Reading 20 mts.</td>
</tr>
<tr>
<td>2</td>
<td>Multiple choice</td>
<td>7</td>
<td>Answering – 25 mts</td>
</tr>
<tr>
<td>3</td>
<td>Vocabulary</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Identification of single words</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Summary cloze</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>55</td>
<td>Total Time : 45 mts</td>
</tr>
</tbody>
</table>

After the development of packages with the help of a Computer programmer, they were administered through computer terminals to 20 students of first year Information Technology at PSG College of Technology. Based on the feedback obtained from the students, few changes in the questions and in the time limit were carried out. The samples were allowed to read the passage as many times as possible within 20 mts. and they were not allowed to refer to the passage while answering the questions. The final version was used to measure the receptive skills of the selected first year engineering college students. Each correct response in both the packages was given one mark (Appendix – XIII).
4.10.2 LANGUAGE APTITUDE TEST

Differential Aptitude tests, developed by Bennet, et. al. in 1947, provide an integrated, scientific and standardized procedure for measuring the abilities of students of different grades. The investigator employed the test of language usage part I and II to assess the productive skills of the samples.

The language usage tests, spelling and sentences are normally achievement tests. These tests represent the basic skills essential for speaking and writing. Language usage test part I deals with spelling. It contains 100 words. Some of them are correctly spelled and some are incorrectly spelled. The respondents were asked to find out whether each word is correctly spelled or not. The numerical value ‘1’ is given to each correct response and ‘0’ to wrong answer. The maximum time allotted was 10 minutes (Appendix – I).

The language usage test part II deals with sentences. This part consists of 50 sentences. Each sentence is divided into five parts and lettered as A, B, C, D and E. The respondents were asked to go through each sentence carefully and identify the section or sections which have errors in them. The errors may be in grammar, punctuation or spelling. The numerical value ‘1’ was given to fully correct answer and ‘0’ to wrong and partially correct answers. The maximum time allotted was 25 mts. All numerical values in language usage tests (part I and II) were added to obtain the individual score on language usage ability (Appendix – II).

4.10.3 GROUP TEST OF INTELLIGENCE

The group test of intelligence in English was constructed and standardized by Dr. G. C. Ahuja, Central Institute of Indian Languages, Mysore in 1971. The test is meant for measuring the intelligence of pupils of age group 13 to 17 + years (Appendix – III).

The test contains eight subtests. The description of the test is presented below.
4.10.4 SOCIO-ECONOMIC STATUS SCALE

The socio-economic status of the students was measured by adopting the scale developed and standardized by Bhardraj and Gupta (1984). The scale covers six dimensions. The dimensions are social, family, education, profession, property and monthly income. The scores obtained in all the dimensions were summed up and the total score was considered as the socio-economic status score in the study.

The number of items and the number of alternatives in each item of each dimension and the value given for each alternative are given below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimension</th>
<th>No. of items</th>
<th>No. of Alternatives</th>
<th>Score in the Decreasing order of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Social</td>
<td>2</td>
<td>5 for each</td>
<td>a - 5, b, c - 4, d - 3, e, f - 2, g - 1</td>
</tr>
<tr>
<td>2</td>
<td>Family</td>
<td>4</td>
<td>5 for each</td>
<td>a - 5, b - 4, c, d - 3, e, f - 2, g - 1</td>
</tr>
<tr>
<td>3</td>
<td>Education</td>
<td>1</td>
<td>7 (a to g)</td>
<td>a - 5, b - 4, c, d - 3, e, f - 2, g - 1</td>
</tr>
<tr>
<td>4</td>
<td>Profession</td>
<td>1</td>
<td>7 (a to g)</td>
<td>a - 5, b - 4, c, d - 3, e, f - 2, g - 1</td>
</tr>
<tr>
<td>5</td>
<td>Property</td>
<td>4</td>
<td>a - 2, b - 5, c - 9</td>
<td>1 - 5, ii - 2, i - v - 5 - 1, i - 5, ii, iii - 4, iv, v, vi - 3, vii, viii - 2, ix - 1, 5 each</td>
</tr>
<tr>
<td>6</td>
<td>Monthly Income</td>
<td>1</td>
<td>5</td>
<td>5 to 1</td>
</tr>
</tbody>
</table>
For each alternative, data were obtained for father and mother. Total for each sample was calculated (Appendix – IV).

4.10.5 FAMILY ENVIRONMENT SCALE

The data related to family environment of the students were collected by the scale developed by Bhatia and Chadha (1993).

The scale consists of 69 statements with three dimensions which are further classified into eight sub-dimensions. The dimensions along with their operational meanings are given below.

I Relationship Dimension

1. Cohesion refers to the degree of commitment, help and support provided by the family members for one another.

2. Expressiveness refers to the level of freedom that the family members have, to express their thoughts and feelings frankly.

3. Conflict points out the aspects such as the feelings of aggressiveness and disagreement among the family members.

4. Acceptance and caring refers to the extent to which the family members maintain social relationship with one another and the amount of care each one takes for the other

II Personal Growth Dimension

5. Independence means the freedom provided to the individual to decide and choose independently which enables the learner to be assertive.

6. Active recreational orientation refers to the involvement in social and recreational activities at home which help the personal development of the family members.

III. System Maintenance Dimension

7. Organization refers to the systematic planning of family activities and responsibilities which are important to maintain discipline at home.
Control indicates the degree to which the rules are followed by the members of the family in maintaining social ethics (Appendix - V).

Out of 69 items of the scale, 41 are positive and 28 are negative statements. The serial number of positive and negative statements for each dimension is given below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Sub Scales</th>
<th>S. No. of Positive items</th>
<th>S. No. of Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Relationship Dimension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Cohesion</td>
<td>1, 9, 24, 37, 43, 55, 60, 63, 66, 69</td>
<td>17, 49, 31</td>
</tr>
<tr>
<td>2</td>
<td>Expressiveness</td>
<td>10, 25, 38, 44, 56</td>
<td>2, 18, 32, 50</td>
</tr>
<tr>
<td>3</td>
<td>Conflict</td>
<td>11, 19, 39, 51, 61, 67</td>
<td>3, 26, 33, 45, 57, 64</td>
</tr>
<tr>
<td>4</td>
<td>Acceptance and Caring</td>
<td>8, 16, 36, 42, 48, 54, 59, 62</td>
<td>23, 30, 65, 68</td>
</tr>
<tr>
<td>II</td>
<td>Personal Growth Dimension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Independence</td>
<td>4, 27, 46, 52</td>
<td>12, 20, 34, 40, 58</td>
</tr>
<tr>
<td>6</td>
<td>Active Recreational Orientation</td>
<td>5, 13, 21, 28, 47</td>
<td>35, 41, 53</td>
</tr>
<tr>
<td>III</td>
<td>System maintenance Dimension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Organization</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Control</td>
<td>7, 22</td>
<td>15, 29</td>
</tr>
</tbody>
</table>

The samples were asked to respond to the statement on a five point scale. The responses were strongly agree, agree, neutral, disagree and strongly disagree. The scoring pattern of items is given below.

<table>
<thead>
<tr>
<th>Positive Items</th>
<th>Responses</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Strongly Agree</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Agree</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Disagree</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>Strongly Disagree</td>
<td>5</td>
</tr>
</tbody>
</table>

4.10.6 COLLEGE ENVIRONMENT SCALE

The data related to the college environment as perceived by the students were collected by adopting the scale developed and standardized by Arockiadoss (1999). The dimensions include campus environment, managerial environment, academic environment, peer group environment and faculty environment.

The statements included under campus environment are intended to elicit responses related to location, popularity, physical facilities and basic amenities of the college.
Managerial environment details the relationship between the staff and students, students and the management, and the aspects such as administration, communication and discipline in the college.

Academic environment emphasizes the curriculum, course content, academic standard and encouragement provided by management and staff towards students.

Peer group environment covers the interaction, competition and cooperation among the staff and students.

Faculty environment refers to the teaching methodology, evaluation system, teachers' treatment of students and teaching facilities.

The scale has 75 items. The serial number of positive and negative items in each dimension is given below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimensions</th>
<th>S. No. of Positive Items</th>
<th>S. No. of Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Campus Environment</td>
<td>1, 2, 3, 4, 6, 8, 10, 11, 14, 15</td>
<td>5, 7, 9, 12, 13</td>
</tr>
<tr>
<td>2.</td>
<td>Managerial Environment</td>
<td>16, 18, 20, 21, 22, 23, 26, 28, 29, 30</td>
<td>17, 19, 24, 25, 27</td>
</tr>
<tr>
<td>3.</td>
<td>Academic Environment</td>
<td>32, 33, 34, 35, 37, 38, 39, 41, 43</td>
<td>31, 40, 42, 44, 45</td>
</tr>
<tr>
<td>4.</td>
<td>Peer group Environment</td>
<td>47, 49, 51, 55, 56, 57, 58, 59</td>
<td>46, 48, 50, 52, 53, 54, 60</td>
</tr>
<tr>
<td>5.</td>
<td>Faculty Environment</td>
<td>61, 63, 65, 66, 68, 69, 70, 71, 73, 74, 75</td>
<td>62, 64, 67, 72</td>
</tr>
</tbody>
</table>

The subjects were asked to respond to the statements on a four point scale.

The responses were strongly agree, agree, disagree and strongly disagree. The positive items were scored from 3 to 0 and the negative items were scored from 0 to 3 (Appendix – VI).

4.10.7 STUDY HABITS INVENTORY

The study habits inventory was developed and standardized by Patel in 1975. The inventory has 45 statements with five point rating scale. Among 45 statements, 27 statements are positive and 18 statements are negative. The scale includes seven sub-dimensions. The sub-dimensions with their operational meaning are given below.

Home environment and planning of work refers to the facilities and home environment for study and systematic planning and preparation of the course content.
Reading and note taking refers to the habit of taking notes while reading the lessons at home and school and clarifying the doubts with the teachers.

Planning of subjects emphasizes the degree to which attention and priority is given to the weaker subjects while studying.

Habits of concentration indicate the level of individual’s attention and memory and how far he could concentrate without being distracted.

Preparation for examinations refers to the method or procedure followed while preparing for exams such as referring to previous question papers and reading only the important sections.

General habits and attitudes refer to reading habits such as memorizing, reading aloud, reading while reclining on bed and discussing with friends.

College environment covers the activities of the learners during the class, in the playground and during leisure time.

The details of the positive and negative items for each sub-dimension are given below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimensions</th>
<th>S. No. Positive Items</th>
<th>S. No. Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Home Environment and Planning of Work</td>
<td>1, 2, 3, 4</td>
<td>5, 6, 7</td>
</tr>
<tr>
<td>2.</td>
<td>Reading and Note taking</td>
<td>8, 9, 10, 11, 12, 13, 16</td>
<td>14, 15</td>
</tr>
<tr>
<td>3.</td>
<td>Planning of Subjects</td>
<td>17, 18, 19</td>
<td>20, 21</td>
</tr>
<tr>
<td>4.</td>
<td>Habits of concentration</td>
<td>22</td>
<td>23, 24, 25</td>
</tr>
<tr>
<td>5.</td>
<td>Preparation for examination</td>
<td>26</td>
<td>27, 28, 29, 30, 31</td>
</tr>
<tr>
<td>6.</td>
<td>General Habits and Attitudes</td>
<td>32, 33, 36, 37, 38, 39</td>
<td>34, 35</td>
</tr>
<tr>
<td>7.</td>
<td>School Environment</td>
<td>40, 41, 42, 43, 44</td>
<td>45</td>
</tr>
</tbody>
</table>

The scoring procedure of the inventory is given below.

<table>
<thead>
<tr>
<th>Positive</th>
<th>Responses</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Always</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Often</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Hardly</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>Never</td>
<td>5</td>
</tr>
</tbody>
</table>

The maximum possible score is 225 and the minimum possibility is 45. The score above mean and standard deviation is considered as good study habits and below mean and standard deviation as poor study habits. The score in between is considered as average study habit (Appendix – VII).
4.10.8 STUDENTS' LEARNING STYLE QUESTIONNAIRE

The learning styles of the students were identified through the standardized questionnaire developed by Grasha and Reichman (1975).

The Questionnaire measures the learning styles which include independent, avoidant, collaborative, dependent, competitive and participative.

Independent style refers to the students’ independent thinking and learning. However, they prefer listening to others and receive the most important factors. Learners who prefer this style are more confident in their learning abilities.

Avoidant style refers to the behavior of some learners who never reveal any interest in classroom learning, therefore, lack participation.

Collaborative style refers to learning by sharing ideas. Learners cooperate with teachers as well as peer group and this style emphasizes social interactions and content learning.

Dependent style is characteristic of students who lack intellectual curiosity and who always depend on teachers and peers for support.

Competitive style refers to the style adopted by students who would like to compete with other students to obtain rewards or teacher’s attention.

Participative style demands more participation in the classroom activities and helps acquire as much as possible from classroom learning.

The questionnaire has 90 items. The serial number of items for each dimension is given below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimensions</th>
<th>S. No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Independent</td>
<td>1, 7, 13, 19, 25, 31, 37, 43, 49, 55, 61, 67, 73, 79, 85</td>
</tr>
<tr>
<td>2.</td>
<td>Avoidant</td>
<td>2, 8, 14, 20, 26, 32, 38, 44, 50, 56, 62, 68, 74, 80, 86</td>
</tr>
<tr>
<td>3.</td>
<td>Collaborative</td>
<td>3, 9, 15, 21, 27, 33, 39, 45, 51, 57, 63, 69, 75, 81, 87</td>
</tr>
<tr>
<td>4.</td>
<td>Dependent</td>
<td>4, 10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70, 76, 82, 88</td>
</tr>
<tr>
<td>6.</td>
<td>Participative</td>
<td>6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90</td>
</tr>
</tbody>
</table>

The samples were asked to respond to the statements on a five point scale. The items are scored as follows.
The dimensions with the highest score will indicate the preferred learning style of the students (Appendix – VIII).

**4.10.9 LEARNERS’ EFFECTIVENESS INVENTORY**

Learners’ effectiveness inventory, developed and standardized by Arockiadoss (1999), was adopted to measure the effectiveness of the learners. The inventory consists of eight dimensions. The dimensions are motivation, interest, attitude towards learning, learning goals, attention, discipline and perseverance.

Motivation to learn is an essential factor as it activates and directs learning behavior. Learners have to develop interest for learning which requires involvement of students in learning.

Attitude towards learning influences the learning behavior. The positive and negative responses towards learning will have their impact on the outcomes.

The learners should possess clear objectives to complete their learning activities successfully. Clear objectives would lead to attainment of goal setting. Learning goals are important for effective learning.

Attention refers to the habits of concentration and helps to select the essential ideas.

Discipline refers to the orderly behavior of the students and their sensitivity to rules and regulations.

Perseverance means hard work and without hard work, effectiveness of learning would not occur.
Memory, the most important dimension, refers to the process of storing information while learning. The perceived information that is stored in short term memory is recollected and transformed into meaningful concepts in the long term memory (Appendix -IX).

The inventory has 48 statements. The serial number of positive and negative items in each dimension is given below.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Dimensions</th>
<th>S. No. of Positive Items</th>
<th>S. No. Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Motivation to learn</td>
<td>1, 27, 43</td>
<td>10, 28, 34</td>
</tr>
<tr>
<td>2</td>
<td>Interest in Learning</td>
<td>11, 17, 29</td>
<td>2, 16, 30</td>
</tr>
<tr>
<td>3</td>
<td>Attitude towards learning</td>
<td>39, 45, 47</td>
<td>4, 18, 36</td>
</tr>
<tr>
<td>4</td>
<td>Learning goals defined</td>
<td>3, 37, 41</td>
<td>12, 26, 32</td>
</tr>
<tr>
<td>5</td>
<td>Attention</td>
<td>5, 23, 33</td>
<td>24, 38, 46</td>
</tr>
<tr>
<td>6</td>
<td>Discipline</td>
<td>13, 25, 35</td>
<td>6, 40, 44</td>
</tr>
<tr>
<td>7</td>
<td>Perseverance</td>
<td>7, 15, 19</td>
<td>22, 42, 48</td>
</tr>
<tr>
<td>8</td>
<td>Memory</td>
<td>9, 21, 31</td>
<td>8, 14, 20</td>
</tr>
</tbody>
</table>

The respondents were asked to respond to the statements on a four point scale. The responses were always, frequently, occasionally, and never. The items were scored as given below.

<table>
<thead>
<tr>
<th>Positive Items</th>
<th>Responses</th>
<th>Negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Always</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Frequently</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Occasionally</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>Never</td>
<td>3</td>
</tr>
</tbody>
</table>

4.10.10 APPROACHES TO LEARNING QUESTIONNAIRE

The approaches to learning questionnaire, developed and standardized by Paul Ramsden (1992), was adopted to collect the data related to learning approaches followed by students.

The questionnaire consists of 18 statements with three dimensions denoting three types of approaches in learning.

Achievement learning refers to the ambition of the students to achieve rank or distinction in their studies.

Reproducing learning is an approach followed by students just to get a pass by reproducing what they have memorized.
Meaningful learning refers to learning for meaning which demands students' involvement.

The serial number of items in each dimension is given below.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Dimensions</th>
<th>S. No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Achievement Learning</td>
<td>1, 3, 6, 9, 12, 15</td>
</tr>
<tr>
<td>2.</td>
<td>Reproducing Learning</td>
<td>2, 5, 8, 11, 14, 18</td>
</tr>
<tr>
<td>3.</td>
<td>Meaningful Learning</td>
<td>4, 7, 10, 13, 16, 17</td>
</tr>
</tbody>
</table>

The samples were asked to respond to the statements on a five point scale. The items were scored as follows:

<table>
<thead>
<tr>
<th>Responses</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>4</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
</tr>
<tr>
<td>Undecided</td>
<td>2</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
</tr>
</tbody>
</table>

The dimensions with the highest score will indicate the preferred approach of the student (Appendix – X).

4.10.11 PERSONALITY TRAITS SCALE

Personality traits scale, adopted from Cattell, consists of 12 traits. The traits included in the scale are as follows:

1. Self-confidence
2. Persistence
3. Co-operativeness
4. Emotional Stability
5. Emotional Control
6. Sense of Responsibility
7. Courtesy
8. Sociability
9. Leadership
10. Initiative
11. Attitude towards life
Each trait has four (two positive and two negative) statements. The scale has 48 statements. Each item has to be responded as always / often / sometimes / rarely / never. A positive item is to be scored 5, 4, 3, 2 and 1 in the scale (always to never) respectively. A negative item is to be scored 1, 2, 3, 4 and 5 in the scale (always to never) respectively. The minimum and maximum possible scores for each trait are 4 and 20 respectively. The theoretical value of each trait is 12 (Appendix – XI).

4.10.12 LOCUS OF CONTROL QUESTIONNAIRE

The locus of control questionnaire was adopted from Crandall. The tool consists of 34 statements which include 18 positive items and 16 negative items. In each item two alternatives are included.

A. Expressing faith in internal locus of control.
B. Expressing faith in external locus of control.

The details of the positive and negative items are given below.

<table>
<thead>
<tr>
<th>S. No. of Positive Items</th>
<th>S. No. of negative Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 5, 6, 10, 12, 13</td>
<td>3, 4, 7, 8, 9, 11, 14</td>
</tr>
<tr>
<td>16, 17, 20, 23, 24, 26</td>
<td>15, 18, 19, 21, 22</td>
</tr>
<tr>
<td>27, 29, 30, 31, 32</td>
<td>25, 28, 33, 34</td>
</tr>
</tbody>
</table>

Key Scores of Locus of control.

<table>
<thead>
<tr>
<th>S. No. of items that indicate ‘A’ as correct answer</th>
<th>S. No. of items that indicate ‘B’ as correct answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 5, 6, 7, 9, 11, 12, 14</td>
<td>1, 3, 4, 8, 10, 13</td>
</tr>
<tr>
<td>17, 18, 20, 23, 24, 26, 29</td>
<td>15, 16, 19, 21, 22</td>
</tr>
<tr>
<td>30, 32</td>
<td>27, 28, 31, 33, 34</td>
</tr>
</tbody>
</table>

A respondent had to read each statement carefully and respond as he feels about each item. Score of each right answer is 1 and a student's score is the sum of positive events and the negative events. The high score indicates the respondent's level of the internal locus of control (Appendix – XII).

4.11 RELIABILITY OF TOOLS USED FOR THE PRESENT STUDY

A pre study was undertaken with 30 Engineering College students to find out the reliability of the tools employed for the present study. After the
collection of pre study data, it was subjected to split-half reliability method and the reliability values of the tools of the present study range from 0.89 to 0.94. The validity of the tools was not undertaken since the tools used for the present study were already standardized and validated by the authors concerned.

4.12 DATA COLLECTION

Considering the major objectives and hypotheses of the present study, the data were collected from the selected engineering college students. At the first phase, the investigator administered the language test batteries which include language aptitude (Spelling & errors) and verbal intelligence. To assess the receptive skills, the samples were administered with computer Assisted Language skills assessment package.

After the completion of language test batteries, at the second phase, the data for independent variables were collected from the samples by using the selected socio-pedagogical tools. The tools related to social factors were given first and on the next day, the tools related to the pedagogical factors were provided. During the data collection, some sample attrition occurred at different stages due to the absence of sample. After certain sample attrition and data screening, the sample size was reduced to 100 at the end of the final data collection. The following table presents the distribution of the sample of the study which was subjected to final analysis of data.

<table>
<thead>
<tr>
<th>Name of the college</th>
<th>No. of Students enrolled</th>
<th>Sampled students 30% of the enrolment</th>
<th>Total No. of samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ECE</td>
<td>CSE</td>
<td>IT</td>
</tr>
<tr>
<td>PSG College of Technology</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Sri Krishna College of Engineering and Technology</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

4.13 STATISTICAL TECHNIQUES USED IN THE PRESENT STUDY

The collected data were subjected to different statistical analysis. The cluster analysis was employed to group the sample and other statistical analyses
such as analysis of variance, correlation and some graphical representations were also used to find out the significant difference between the groups, and to find out the relationship among the variables. The Cluster analysis is a statistical technique which is used to arrive at different homogeneous groups based on their characteristics. Cluster analysis is also called Numerical Taxonomy in the field of Biology. In Biology, this technique is used to classify the organisms based on relationships inferred from the characteristics of the whole organism (Rohlf, et. al., 1967). Now this technique is widely applied in Social and Behavioral Sciences to classify and compare similarities between individuals and also to arrive at homogeneous groups (Sokal and Sneath, 1973; Nagarajan, 1977; Krishnan, 1978; Jayamani, 1979 and Rajmohan, 1982).

So far this technique has not been extensively used in the field of Education to arrive at homogeneous groups based on individual differences. Hence, the present study adopted this technique to evolve typologies or groups (homogeneous) based on differential language skills of the students.

4.14 ANALYSIS OF DATA

As a first phase of analysis, the data collected with the help of tools related to language skills such as listening skills, reading skills, language aptitude and verbal intelligence were subjected to cluster analysis to group the samples of the study based on differential language skills (Fig. 1). Three distinct groups such as high, moderate, and low group based on their relationship of language skills emerged consequent to the cluster analysis of language skills data. The high, moderate and low group of cluster analysis had 45, 36 and 19 samples respectively.

As a second phase of analysis, the data related to socio-pedagogical variables of the three groups were subjected to analysis of variance to find out the influence of socio-pedagogical factors on language skills of the selected engineering college students of the study.
Fig 1 - TAXONOMIC CLUSTERING OF ENGINEERING COLLEGE STUDENTS BASED ON THEIR DIFFERENTIAL LANGUAGE SKILLS

Low Group (N 19)

Moderate Group (N 36)

High Group (N 45)
4.15 SUMMARY

The methodology chapter has presented in detail the design and description of the procedure employed to construct and standardize the tools and to generate the data for verifying the hypotheses formulated in the study. The chapter also deals with the different stages of data collection and the statistical techniques used to group the samples and to arrive at the results and conclusion.