CHAPTER III

METHODOLOGY

3.1 Design of the Study: A broad outline of the study is presented in this chapter, which includes purpose of the study, variables and hypotheses, different studies involved in the research, description of the sample, tools employed in the research, data collection and operational definitions of terms used in the study.

3.1.1 Purpose of the Study:

Main purposes of the study were:

1) To investigate into the academic achievement of the college students in Marathwada Region.

II) To determine the relationship of academic achievement to intelligence, self concept, personality adjustment, interpersonal relationship and socio-economic status.

3.1.2 Variables and Hypotheses:

Academic Achievement is the dependent variable in the present study and intelligence, self concept, personality adjustment, interpersonal relationship and socio-economic status are the independent variables. Self concept has 3 subvariables and Personality adjustment has 5 sub-variables. Total number of variables including subvariables involved in the study is 12 as given below:

1. Academic Achievement.
2. Intelligence.

Self-concept has 3 subvariables related to the 3 aspects of self-concept.
3. Perceived self.
4. Social Self.
5. Ideal self.

Personality adjustment has 5 sub-variables as follows:

6. Home and Family Adjustment.
7. Social Adjustment.
8. Personal and emotional Adjustment.
10. Health Adjustment.
11. Study of Interpersonal relationship was done in terms of PIRC-B (Fundamental Relations Orientation-Behaviour).

Nature of Study is comparative and sex and area were taken into consideration.

**HYPOTHESES:**
Following hypotheses are laid down for the study.

1. Academic Achievement of Males and Females differs significantly.
2. Academic achievement of urban and rural students differs significantly.
3. Academic achievement of the students of lower and higher Socio-economic groups differs significantly.
4. Intelligence of males and females differs significantly.
5. Intelligence of the urban and rural students differs significantly.
6. Intelligence of high achievers and low achievers differs significantly.
7. Self concept of males and females differs significantly.
8. Self concept of urban and rural students differs significantly.
9. Self concept of high achievers and low achievers differs significantly.
10. Personality adjustment of males and females differs significantly.
11. Personality adjustment of urban and rural students differs significantly.
12. Personality adjustment of high achievers and low achievers differs significantly.
13. Interpersonal relationship of males and females differs significantly.
14. Interpersonal relationship of urban and rural students differs significantly.
15. Interpersonal relationship of high achievers and low achievers differs significantly.
16. Significant correlation exists between academic achievement and intelligence.
17. Significant correlation exists between academic achievement and self-concept.
18. Significant correlation exists between academic achievement and personality adjustment.
19. Significant correlation exists between academic achievement and interpersonal relationship.
20 Significant correlation exists between academic achievement and socio-economic status.

3.1.3 Sample:

The sample used in the present study is drawn from the population of students learning in colleges of Marathwada, in the faculties of Arts, Commerce and Science, from 1st to 3rd year. Colleges were randomly selected and every care was taken to have the sample to be representative of urban and rural, male and females population.

3.1.4 Tools Employed:

Following tools were used for measuring different variables in the present study.

1. Non-verbal test of Intelligence devised by Dr. Nafde.
2. Self concept Inventory by Dr. Jogawar.
4. Adjustment Inventory by Dr. Palsane.
5. Socio-Economic status schedule by Dr. Jogawar.

Information of the above tests is given in this chapter under the heading "Instruments used." All the tests were administered in Marathi.

Personal and Academic Data sheet:

Personal and Academic Data sheet was prepared by the investigator which included name in full, college, year or class, division, faculty, sex, urban/rural, religion, age, caste, temporary and permanent address. For academic information marks obtained by students in aggregate in the last 3 consecutive years of college were obtained.
3.1.5 Data Collection:

Investigator personally collected the data with the assistance of 3 students of psychology, administering all the tests mentioned under heading "tools employed." The assistants helped investigator to distribute and collect test material and guiding the subjects if necessary. Batches of 40-50 students were made. The whole testing required about 2½ hours duration with the pause of five minutes.

3.2 Operational Definitions of Terms:

Definitions of terms used in the present study are given below.

**Academic Achievement:**

It is the academic performance in terms of average percentage of marks obtained at three consecutive annual examinations.

**Intelligence:** Dr. Nafde (1961) whose Non-verbal test of Intelligence (NVTI) was used in the present research, based his Intelligence test not on single definition but on several definitions given by different authors. The test is based on the definitions of Binet. The processes covered by the test are the education of relations and education of correlates.

**Self Concept:** A sum total of the individuals ideas he holds about his abilities, attitudes dispositions, interests, feelings etc., his preception of other's ideas about himself, and his conception as to what type of person he would like to be.
**Perceived Self:** How a person thinks he is like i.e. what one thinks he is.

**Social Self:** How one thinks other perceive him, his perception of others ideas about himself.

**Ideal Self:** What type of person one would like to be.

**Personality Adjustment:** The relationship between the individuals and his environment.

**Home and family Adjustment:** This refers to individual's status in respect to home and family.

**Social Adjustment:** The person's relations with other individuals and social institutions.

**Personal and emotional Adjustment:** This refers to personal and emotional poise of the individual i.e. extent of over-criticality, fault findingness, faith and confidence in himself and others, the fluctuations mood, feelings of guilt, worry, loneliness, daydreaming, excitability, calmness, control over emotions etc.

**Educational Adjustment:** This refers to the individual's adjustment status in the educational area i.e. satisfaction with education, desire for higher education, students relations with the teachers, the administrators and co-students.

**Health Adjustment:** This is concerned with individual's health problems i.e. extent of his illness from chronic diseases, pains and aches etc.

**Interpersonal behaviour:** Interaction of individual with one another.

**Socio-Economic status:** The amount of prestige the
individual's family holds in the society. Some of the factors contributing to socio-economic status are education, occupation, income, social participation of head of the family, the caste of the family, their land, house, farm power, material possession and the general nature of the family.

**Urban Area**: Area coming under municipality / municipal corporation / cantonment.

**Rural Area**: Area coming under village or gram panchayat.

**3.3. INSTRUMENTS USED:**

**Academic and personal Data Sheet:**

Academic and personal data sheet was prepared for the purpose of the study. Achievement in academic subject has been defined as accomplishment or proficiency of performance in academic subjects offered in colleges or schools. Accordingly to obtain an index of achievement it was necessary to measure this performance. There were two alternative procedures which could be followed - A standardized achievement test common for all subjects in each of the subjects offered, could be administered, scored and the results obtained or the marks assigned by the examiners at the annual examinations conducted could be collected and the index of performance obtained. The first alternative provides data that can be relied on for their accuracy in measurement. But unfortunately no such tests were available for all the subjects which could be administered to
this particular angle. The marks obtained at the annual examinations, since these are not objective type tests and are based mainly on essay type questions, are subject to all the biases inherent in subjective evaluation. But since no other criteria were available examination marks of three consecutive examinations were taken and were averaged. Maximum caution was exercised in accepting them. Those were verified from college record. It was decided to calculate average percentage of marks obtained at three consecutive examinations and was considered to the index of academic achievement. The intercorrelations of the three examination marks were calculated on randomly selected students. Marks of these were correlated with each other by using Pearson's Product Moment correlation method. The average correlation was .64. Reason for the low average correlation may be the interval between two examinations which is one year, and two years respectively. Academic and personal data sheet is presented in the appendix.

3.3.1. Intelligence Test:- Several intelligence tests have been developed by many authors. Important foreign and Indian intelligence tests have been mentioned by Bhargaw (1973). Generally intelligence tests have been classified into 5 categories namely individual intelligence tests, group intelligence tests, nonverbal intelligence tests, verbal intelligence tests and performance tests of intelligence.
There are limitations for the use of intelligence test in India due to many reasons. There are verbal and nonverbal tests of intelligence constructed under local conditions for group as well as individual administration. Verbal tests have been constructed and standardized on population belonging to separate states. People of various states speak different languages. Hence it is impossible to use the same test in all the states which speak different languages. Translating the test in local language in as good as reconstructing the same under local conditions. For research work on large sample, group and non verbal intelligence test is almost convinient and suitable.

Nonverbal Test of Intelligence constructed by Dr. Nafde (1961) was used in the present study as it is a group and non-verbal, paper pencil type and well standardized tests. This test consists of four subtests namely 1) Analogies ii) Water Reflection iii) Series and iv) Classification. In each subtests there are 20 problems. Thus the total number of test items is 80. Besides this, there are six problems for each subtests. Time limit for each subtest is 5 minutes. There is separate answer sheet.

The NVTI was standardized on total sample of 7500 students of different categories of ages 9 onwards. Age as well as class norms for different groups have been worked out. Separate norms for boys and girls have also been developed. Considerably high indices have reported
for the test. The reliability coefficient computed by split half method for two groups were .89 and .94. The reliability estimate found by test-retest method for 4 different groups at intervals of one day, one week, two weeks and three months ranged from .74 to .88. The reliability determined by the Kuder-Richardson Formula for five groups ranged from .88 to .96. Highly satisfactory validity was reported for the test. The test was validated against a) School marks b) Teachers Judgement c) Five other tests. The validity coefficients ranged from .46 to .75.

Scoring of the test can done with the help of scoring stencil subtestwise. The raw score was found out. The number of right and wrong answers, blanks were noted and written against R, W, and B respectively. The score of an individual is calculated from the formula.

\[ S = \frac{W}{4} \]

Where,

\( S = \) Score, \( R = \) Right Number, \( W = \) Wrong Number.

Score can be converted into IQ using formula

\[ IQ = 15 \left( \frac{\text{Score} - \text{Mean of the Age Group}}{\text{S.D. of the Age Group}} \right) \]

3.3.2 Self-Concept Inventory:

As there are number of theoretical construct of "Self", there can not be a single measure, which
can be a true measure of self concept. Self-concept is a subjective phenomenon which has both conscious and unconscious aspects.

According to La Benne and Green (1969), when one reviews the studies constructed on self-concept, it is obvious that the methods used for the purpose considerably depend on research design and the factors to be measured, with a little agreement on definition and great differences in theoretical orientation. They have given the reasons: i) The absence of external criteria and problem of inference ii) Social desirability and defensiveness of the respondent iii) Non equivalence of different self concept tests and iv) Misconstruction of the self-report as being synonymous with self-respect.

Different techniques are used to measure self concept, which include paper and pencil tests, rating scales, adjective check list and inventories to determine self concept through introspective self reflection and self report. There are also projective TAT type list to assess self concept as also there are objective test results. Besides, statements in interview, dream reports and direct observations and many other sources of information may be used by researchers to study and understand subject's self-concept.

Self-concept Inventory developed by Dr. Jogawar (1975) was used in the present study. It was standardized on Marathi speaking secondary school students and
college students. Jogawar's self concept inventory consists of 63 adjectives out of which 36 are socially desirable and 27 are socially undesirable. Socially desirable adjectives include 9 adjectives related to each of social, emotional and attitude aspects. For each of these adjectives a 4 point rating scale is provided for obtaining the responses. These 63 adjectives with a 4 point rating scale against each of them formed the self concept inventory for the measurement of 3 aspects of the self concept i.e. perceived self social self and ideal self. The respondent has to check each of 63 adjectives, at one of 4 points for each of 3 aspects of self concept. The test is untimed though subjects are asked to work as rapidly as possible. With the help of the scoring key, responses given can be scored. Four points of rating scale provided to the inventory are "Very much", "Much", "Little", "Very little" Middle point average is purposefully dropped to eliminate the general tendency of marking it in most cases. Scores 4, 3, 2, & 1 are respectively given to these 4 points in case of socially desirable adjectives while scores 1, 2, 3 & 4 are given in the case of socially undesirable adjectives. Higher the score on this inventory the subject gets, more socially desirable he thought of himself. According to this system of scoring, range of possible score is from 63 to 252.

Reliability indices are reported to be satisfactory for the inventory. Test retest reliability of the
instrument was established. Reliability estimates for perceived self, social self and ideal self were .78, .73 and .76 respectively. Due to the absence of external criterion, no predictive and concurrent validity could be established. The author has thought of content validity. For this purpose through discussions with five teachers of psychology were held. The points of discussion were 1) Whether the adjectives selected covered the wide range of personality 2) Whether the procedure of administration and the instructions were satisfactory 3) Did the responses of the individual to this test reveal his self concept? All the judges were in good agreement and expressed their satisfaction about the points noted above.

3.3.3 Personality Adjustment Inventory:

Falsane Adjustment Inventory (1977), consists of 375 statements. It measures adjustment in five areas namely home and family, social, personal and emotional, education and health adjustment. The answer sheet provides for these response categories are "True", "False" and "Against each item. There are five scoring keys for the five scales. With the help of norms and classification tables given in the manual, adjustment category with its descriptive term and percentile rank in a particular area are derived for the score. In this adjustment inventory five categories i.e. A, B, C, D, & E are used. These five categories of adjustment are described respectively by five descriptive terms i.e. excellent, good, average,
unsatisfactory and very unsatisfactory. In this inventory high score indicates unsatisfactory adjustment while low score indicates satisfactory or better adjustment.

With the sample of 200 pre-university students (both boys and girls together) the test-retest (with an interval of 4 weeks) reliability of all 5 scales was estimated. The reliability estimates of the scales ranged from .79 to .93.

Content validity of the entire scale has been ensured by reference to other scales of adjustment as well as to the concept of adjustment in different areas chosen for assessment. Item analysis was carried out scalewise on the basis of statistical index of item total consistancy (Chi-Square). This is an index of item validity. It can therefore be said that the scales of the inventory are internally consistant and homogeneous.

3.3.4 Interpersonal Relationship Test: Two instruments are widely used to assess the interpersonal relationship. Those are Interpersonal Perception Method (IPM) and FIRO-B. Test. The IPM is highly complex instrument, developed by Laing, Philipson and Lee (1966). It is designed for use in dyads where 2 persons respond to the test in terms of their perceptions of self and the other. FIRO-B Test (Schutz, 1967), represents a direct application of his three dimensional theory of interpersonal behaviour in that it measures three dimensions of interpersonal functioning viz. Inclusion—the need to establish and maintain satisfactory interaction and association with people
2) Control—The need to have satisfactory control and power relationships with people and 3) Affection-relationship with people. Moreover, according to Schutz's (1966) theory, each dimension of interpersonal behaviour has 2 aspects: expressed and wanted. Expressed behaviour indicates the behaviour the individual expresses towards others whereas wanted behaviour points to the behaviour he expects from others. Deprived people are supposed to suffer a lot in respect of these three interpersonal needs and their 2 aspects on account of the discrimination of all types to which they are subjected. Hence the FIRO-B test was used to assess the interpersonal behaviour of the subjects.

The reliability of the FIRO-B test was estimated in terms of coefficient of internal consistancy and the coefficient of stability, internal consistency was measured in terms of reproducibility score. The reproducibility of all the scales was established on a small population of Air force personnel. It was very high and consistant over all samples. The producibility score was from .93 to .94. The test was administered to the sample of students with one week interval. The coefficient of stability ranged from .71 to .82. FIRO-B has concurrent validity. Studies presented include on investigation of FIRO-B political attitudes, FIRO-B and occupational choice and FIRO-B and conformity behaviour. In addition to these studies, the correlation of FIRO-B with various personality tests and behaviour measures was drawn.
Scoring of FIRO-B test is simple and can be done by hand. Under each statement, in the questionnaire six answers are given. The respondent has to choose one of the six given alternative as response to each statement or item. With the help of scoring key responses given to the items are to be scored. For each item, the score is 0 or 1. The scale score (the number of items accepted for each scale) ranges from 0 to 9. Thus six scales yield six scores and the FIRO-B total score is calculated by adding these six scores, which is taken into consideration for the present study.

3.3.5 Socio-Economic Status Scale:

Socio-economic background of the individual in social sciences has led to the formulation of many scales for the measurement of socio-economic status. Several authors like Cattell, (1942), Cattell (1943), Hollingshed and Redlich (1958), have constructed socio-economic status scales on the basis of various criteria.

Certain characteristics determine the socio-economic status of an individual. These characteristics apply to both urban and the rural families while estimating the socio-economic status scales for urban and rural areas. Pareek and Trivedi (1963) enumerated and discussed the important socio-economic status scale prepared for urban and rural families. The important scales prepared for urban families are those developed by Chapin (1928), Kuppuswamy (1962),

In the present investigation socio-economic status scale, devised by Jogawar (1985), is used. Jogawar (1985), revised previous scale (1975) and constructed to suit it for urban as well as rural families. Following factors under socio-economic scale were considered.

1. Financial position of the family.
2. Education of parents.
3. Occupation of parents.
4. General cultural atmosphere in the family and participation by the parents. In the cultural activities of the town.

The co-efficient of correlation of the socio-economic status scale is .97 which is very high proving firmly the high reliability of the instrument. Co-efficient of validity of socio-economic status scale is .69 and is quite high leaving no doubt about inventory's usefullness.

Four socio-economic classes are given for the norms which are namely 1) Lower ii) Lower middle iii) Upper middle & 4) Upper. Range of scores can be derived and the test can be scored manually.
1.4. STATISTICAL ANALYSIS

Different statistical techniques were applied to data at different stages of research according to the need.

Normality of the distributions were verified by comparing the expected frequencies on the basis of normal curve and then applying the test of normality. Chi-square test of normal distribution hypothesis was applied to test whether the obtained distribution of frequencies depart significantly from the normal.

For testing the hypotheses the t-tests were employed. The t-tests were used to make comparison between males and females, rural and urban, high and low achievers in respect of different variables.

Statistical techniques employed for different purposes are given below.

1. Chi-square Test of the Normal Distribution Hypothesis (Vide Guilford 1982).


3. "t" test (Vide Guilford (1965)).


3.5. SELECTION OF THE SAMPLE:

Composition of the sample is dependent on the nature of the study. Investigator wishes to compare the academic achievement of the college students in Marathwada region with the intelligence, self concept, personality adjustment, interpersonal relations and socio-
economic status. Hence the sample composed of the students from urban and rural area in both sexes i.e. males and females studying in senior college of Marathwada region. Students from allover Marathwada were selected to make the sample representative. Colleges which were selected for the data collection were as follows:

2. Arts and Commerce College, old Jalna.
4. Deogiri College, Aurangabad.
6. Govt. Arts and Science College, Aurangabad.
7. Mrs, Kesharbai Sonajirao Kshirsagar Alias Kaku Arts, Science and Commerce college, Beed.
13. Pandit Jawaharlal Nehru Mahavidyalaya, Aurangabad.
15. R.G. Bagdia Arts, S. B. Lakhotia Commerce and Barenji Science college, Jalna.
Colleges were so carefully selected that the sample would be representative of Marathwada region.

Care was taken to give adequate representation to male and female students. Colleges from every district of Marathwada were selected so as to receive representation to all the districts. To balance the sample of the males and females, urban and rural, colleges from rural area were selected. Reputed institutions in Marathwada are also taken into consideration. Students from arts, commerce and science were selected to become sample representative. Sample also is composed of all the socio-economic strata.

Planned size of the sample is presented in Table 3.1 and every attempt was made to collect data according to the planned size.

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<thead>
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<th></th>
<th>Urban</th>
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<td>500</td>
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<tr>
<td>Total</td>
<td>1000</td>
<td>1000</td>
<td>2000</td>
</tr>
</tbody>
</table>
3.6. ADMINISTRATION OF THE TESTS

A preliminary trial of all the tools was conducted before the actual administration of tests for collecting the data for research. Purpose of the pilot study was to determine the time required for the administration of tests and to review testing procedures for any unforeseen difficulties and training and the experience to the assistants who helped in data collection. Entire testing operation took approximately two and half hours with five minutes interval and the information received was helpful in planning and carrying the actual study.

Data were collected for the research by the investigator personally by applying all the instruments selected for study. Instruments mentioned in this chapter were used and the data were collected from 18 senior colleges, during the period December 1988 to January 1989. Three psychology students assisted the investigator in the data collection, who distributed and collected the test material and assisted the subjects if necessary. Testing procedure was identical with the procedure used in preliminary trial of the tools.

Administration of the test for the purpose of collection of data was done in groups. Two classes were combined, where the number of students in a particular class was found to be inadequate. Generally the testing was done in the batches of 40-50 students at a time.
Total testing was carried out in several sessions, with prior permission of the principals of the said colleges. Teachers from the colleges also helped in administering the tests. Test session were supervised by the investigator. Lecturers helped in maintaining general discipline in students during the testing session.

Following precautions were taken before the actual administration of tests.

1. Adequate light in the classrooms.
2. Comfortable seating arrangements for the students.
3. Assistants and the investigator can easily distribute test material and can assist the subjects.
4. Every testee gets test material in proper time.
5. Good rapport was established with the students before the actual administration with the help of introductory speech. Students were taken into confidence and the importance of honest and true responses was stressed upon the.
6. Brief information about testing was given to every student and it was ensured that each of them has followed the same.

Tests were carried out according to the specific instructions given by the author of the test. Intelligence test (NVAT) was given at the beginning as it is time bound test. Emphasis was given on the oral instructions besides printed instructions specified in the test, because many students were not familiar with such type
of psychological tests. Sufficient time was taken before the actual administration to explain the test and how it was to be answered. Only when the investigator was satisfied that the students had understood all the instructions they were allowed to respond to the test. Students were asked to fill up the personal and academic data sheet. Interval of about 5 minutes was given approximately in the middle of the test session to avoid fatigue to the students. Investigator, with his assistants constantly supervised, while the students were answering the tests to see that they donot copy each other, and also to assist if necessary.

There was no time limit except for the intelligence test. In NVIT Subjects were asked to finish as many as items within time limit. In other tests students were asked to check responses again and to ensure no response was left unanswered. Total time required for the complete session was 2½ hours with the pause of 5 minutes.

Material was collected when all the tests were completed. All the tests and academic and personal data sheets were tagged together. Total number of complete cases is 1549. The incomplete cases were discarded. A numerical break down is presented in the table. 3.2.

**Table 3.2**

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<th>Urban</th>
<th>Rural</th>
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<td>421</td>
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</tr>
<tr>
<td>Female</td>
<td>401</td>
<td>353</td>
<td>754</td>
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<tr>
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<td>774</td>
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3.7 SCORING PROCEDURES AND TABULATION

Scoring of all the tests was done according to instruction manual of the tests. Indices of academic achievement were derived according to procedure given in this chapter.

Scoring for intelligence test was simple and could be done with the help of scoring keys. In self concept inventory three aspects of self were scored separately. In personality adjustment inventory five areas of adjustment were scored separately with the help of scoring keys. In PIRO-B score for total PIRO-B test was calculated. Socio-economic status schedule was scored manually. Different score tables were prepared for each variable and subvariable groupwise. Subjects in the present study fell into the following 8 main categories.

1. Male (M)
2. Female (F)
3. Urban (U)
4. Rural (R)
5. Male Urban (MU)
6. Male Rural (MR)
7. Female Urban (FU)
8. Female Rural (FR)

For each test of above 8 groups score tables were prepared and 8 tables of indices of academic achievement were also prepared. Groups were also formed on the basis of high and low achievers.