CHAPTER IV

METHODS OF INVESTIGATION
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This chapter deals with various procedures followed in the construction and standardization of data gathering instruments to measure the different variables, included in the present investigation. A brief description of methods adopted in the selection of the sample, collection of data, scoring, analysis and statistical techniques employed, are presented here under.

4.1 TOOLS USED IN THE PRESENT STUDY

The following tools used in the present study are shown here:

1. Objective Achievement Test (OAT)

To measure the achievement of the students, the Objective Achievement Test prepared and standardized by the investigator.

2. Personal values questionnaire

To measure the values of B.Ed. students, the personal values questionnaire developed by Sherry and Varma (1996) was adopted.

3. Raven's standard Progressive Matrices (R.P.M.) Scale

To measure the intelligence of the students, the Standard Progressive Matrices prepared and standardized by Raven, J. C. (1950) was adopted.

4. Cattell's 16 personality factors (16 PF), Form 'C'

To measure the personality traits of the students, Cattell's 16 personality factors (16 PF), Form 'C' prepared and standardized by Cattell (1969) was adopted.

5. Teacher's Attitude Inventory

To measure the attitude towards teaching profession of the B.Ed. students, Teacher's Attitude Inventory prepared and standardized by Manchala, C. (2007) was adopted.
6. **Socio – Economic Status (S.E.S) scale**

To measure the Socio – economic status of the students, socio – economic status scale prepared and standardized by Aaron, P. G., Marihal, V.G. and Malathisa, R.N. (1974) was adopted.

7. **Socio – Demographic Scale**

Socio – Demographic Scale is developed by the investigator to measure the socio – demographic variables.

The flow chart showing the procedure followed in the present investigation is given in **Figure -1.**

4.1.1 **Construction of objective achievement test (OAT)**

An achievement test is essentially a tool or a device of measurement that helps in ascertaining quantity and quality of learning at the end, in a subject of study or group of subjects, after a period of instruction; Dictionary of Education (1998) refers it, to the performance in a school or a college in a standardized series of educational testing. Longman active study dictionary of English (1998) and Cambridge International Dictionary (1996), regarded it a success in reaching an aim, especially after a lot of hard work. It is also defined as the specified level of attainment or proficiency in academic work, designed by test scores.

In the present study “Achievement” refers to the attainment of marks in an objective achievement test constructed and standardized by the investigator for B.Ed. students.

The Common core syllabus of B.Ed. in Andhra Pradesh conducts an annual examination at the end of each academic year, for B.Ed. students. It consists of the following papers. They are:

1. Foundations of Education
2. Psychological Foundations of Education
3. Educational Technology and Computer Education
4. School Management and Systems of Education
5. Personality Development and Communicative English

4.1.2 Construction of the preliminary form

Before constructing the OAT, the investigator referred the B.Ed. text books, the syllabus and previous and various entrance tests question papers. The investigator consulted the senior lecturers, teaching the subject, for B.Ed., the subject experts and experts in the construction of objective questions. After the setting of questions by the investigator, it was thoroughly reviewed with the help of senior subject lecturers and subject experts. Some questions are deleted and some others are added on their advice and finally the OAT is constructed, with 250 questions, each question carrying half mark.

All the questions are multiple choice questions, with four alternatives for each question. Only one alternative is the correct answer out of the four alternatives. The pupils are asked to choose the correct alternative for each question.

A copy of the Telugu version of the Objective Achievement Test (OAT) used for pilot study is presented in the Appendix – A. A copy of the English version of the OAT used for pilot study is presented in the Appendix – B. A copy of the Answer sheet of the Achievement Test used for Pilot study is shown in Appendix – C. A copy of the scoring key of the Achievement Test used for Pilot study is shown in Appendix – D. Flow chart showing the procedures followed in the present study is given in Figure – 1.
Fig. 1: Flowchart showing the procedures followed in the present study
4.1.3 Pilot Study

The Telugu version of the preliminary form of OAT is administered on 200 students of different colleges. The colleges are selected at random. The colleges selected are two Government and two private colleges.

The sample design for pilot study is shown in the Table 1.

**Table 1**
Sample design for pilot study

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4.1.4 Administration of the Pilot Study

The investigator obtained the prior permission from the heads of the institutions, selected for pilot study, to conduct the test, after explaining them the purpose of the study and convincing them. The investigator explained the purpose of the test to the students and asked them to prepare well on the total syllabus. The test is conducted, after giving sufficient time for preparation. The test is conducted with the help of the lecturers and all the answer sheets are collected. The investigator visited the different colleges on different dates and conducted the test according to the schedule, given earlier.

4.1.5 Scoring Procedure – Pilot Study

Half mark is awarded for each correct answer and the total marks obtained by each student are marked on the right top corner of the sheet.

**Item Analysis**

This procedure of item analysis is adopted from the prescribed standardized procedure, for construction and use of tests for class room examinations. For the
present study, the difficulty index and validity index of each item are computed, by following the procedure in the textbook "Statistics in Psychology and Education" by Garrett (1973) given in the pages 365 to 368.

On the basis of total marks obtained in the OAT, the answer sheets are arranged in descending order. The upper 27 per cent of papers and lower 27 per cent of the papers are separated and are named as High group and Low group. These two groups of papers are taken for analysis and the rest are excluded from analysis. Papers of High group are then computed to find out how often, the correct answer to each question has been chosen by the pupils in the group. The numbers thus obtained are recorded. Papers of low group are also corrected in the same procedure. Percentages of correct responses are also recorded.

If the validity index approaches to 1.00, the question tends to discriminate perfectly between high and low achievers. As the validity index approaches to Zero, the question does not discriminate between high and low achievers.

After ascertaining the difficulty index and validity index for each item in the preliminary test as per the guidelines given by Garrett (1973). Fifty questions whose validities are less than 0.37 are deleted and a final test is constructed. The difficulty index and validity index (Discriminating power) of OAT are given in the Table – 2.

The questions deleted from the preliminary OAT are also shown in the Table – 2.

Table – 2
Difficulty index and validity index of the items of pilot form of objective achievement test

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175.
The validity of a test is concerned with, what is measured. It refers to the degree to which extent; the test scores predict some practical criterion measures. There are various methods of estimating the validity of a measuring instrument.

Table – 2 Shows the difficulty index and validity index of each item of the OAT. The following validities are established for the OAT.

1. **Content validity**

   This form of validity is estimated by evaluating the relevance of the test items, individually and as a whole. Validity of content should not depend upon the subjective judgment of only one specialist. In the present case, the previous question papers were thoroughly reviewed, views of specialists in the subject were taken, the investigator thoroughly referred the total syllabus, the items in the test were thoroughly scrutinized with respect to the subject matter and hence it is assumed that the OAT has content validity.

2. **Item validity**

   The validity index calculated for each of the items is a measure of the extent, to which a given item differentiates the low groups and high groups. Thus the items in the inventory with validity index, equal to or greater than 0.37 ensure the item validity of the OAT. Hence the OAT has item validity.
3. **Intrinsic Validity**

Guilford (1954) defined intrinsic validity as, "The degree to which a test measures what it purports to measure". This can also be stated in terms of how well, the obtained scores measure the test’s true score component. This validity is given by the square root of its reliability. Hence the intrinsic validity of the OAT is 0.970.

4. **Face validity**

If a common thread of achievement runs through all the items of the test, then the test is said to have face validity. All items in the OAT have a common thread for measuring the achievement of B.Ed. students. Hence the OAT has face validity.

5. **Construct Validity**

Construct validity of a test measures particular characteristics of the individual taking the test. A test is valid from the construct point of view, if it can indicate the individual’s actual achievement of instructional objectives. All the questions in the objective achievement Test (OAT) are based on the objectives of instruction. Hence there is construct validity for the OAT.

6. **Concurrent validity and predictive validity**

In a situation of some observable criterion, the scale’s validity can be investigated by seeing how good an indicator it is. This approach leads to two categories of validity (i.e.) ‘Predictive Validity’ and ‘concurrent validity’.

Predictive validity is concerned with how the scale can forecast a future criterion and concurrent validity with how well it can describe a present one. The results in the succeeding chapter show that the OAT has both concurrent and predictive validities.

4.1.7 **Final Study**

The final OAT paper is prepared after deleting, the invalid 50 items whose validity index is less than 0.37. In the present investigation, the investigator wants to retain 200 items for the final study. Hence the items with validity index more than 0.36 are retained for final study. The final version of the OAT paper is translated into English. The translation is observed by three experts in English and they confirmed that there is no ambiguity in the translation. The Telugu and English versions of the
final OAT papers are presented in the Appendix – E and Appendix – F respectively. The answer sheet of the OAT used for Final study is given Appendix – G. The scoring key of the OAT used for Final study is given Appendix – H.

4.1.8 Reliability

Next to validity, reliability is the most indispensable characteristic of any measuring instrument. It refers to the consistency of scores obtained by the same individuals at different occasions or with different sets of equivalent items.

A tool is said to be reliable, if it reveals similar results in various situations. The test – retest and parallel form methods of estimating reliability may be common and legitimate for both power and speed tests. In the power test each student has enough time to write what he knows. The split – half technique is not proper for speed test, in which he does not have time to respond to some questions, for which he knows the correct answer. Speed test usually yields spuriously high reliability co-efficient, when split – half and internal consistency methods are employed (Stanley et al., 1978).

Split – Half reliability is some times called as co – efficient of equivalence. The test is split into two equivalent halves, usually by pooling the odd numbered items for one half where as, the even numbered items forming the second half of the test. This usually makes the two scores obtained from a single test reasonably equivalent.

The reliability of the OAT is tested by employing Test – Retest method on a sample of 250 with a gap of 15 days for retest, Split – Half Technique and K.R. Formula – 20. The Reliability coefficients of the OAT are presented in Table – 3.

Table – 3

<table>
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<th>S. No.</th>
<th>Type of the Reliability</th>
<th>Magnitude of Reliability</th>
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<td>2.</td>
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<td>3.</td>
<td>K.R. formula – 20</td>
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178
The magnitude of the coefficient of correlation in all the above three methods is more than 0.890. Hence the reliability of the OAT is very high.

4.2 PERSONAL VALUES QUESTIONNAIRE

4.2.1 Adoption of personal values questionnaire

Since it was proposed to study the influence of more number of values, it was felt appropriate to adopt the personal value questionnaire developed by Sherry and Sharma since it was designed to consist 10 values viz., religious value, social value, democratic value, aesthetic value, economic value, knowledge value, hedonistic value, power value, family prestige value and health value.

As the form was originally in English, a translated version of it into the regional language (Telugu) was necessary as the respondents of the present study happen to be well conversant with Telugu language. Though the DIET students have English as a subject, yet they study the other subjects in the regional language. In order to know whether the items of the questionnaire were carrying the same sense or not the translated version was presented to 10 experts serving in the departments of education, philosophy, psychology and experienced principals of B.Ed. and DIET colleges. Their suggestions were carried out wherever necessary. Further, both the English and Telugu versions of the questionnaire were administered to 200 DIET students having good proficiency over Telugu and English with an interval of three weeks. The reliability indices for both the versions varied between 0.85 to 0.93. In addition, the Telugu version thus obtained was also subjected to test retest reliability by administering it on 200 DIET students with an interval of three weeks. Reliability indices to adopt and administer the tool in the translated version and rely upon the scores obtained thereby. The procedure of administration and scoring was essentially the same as presented in the manual.

The tool was developed by Sherry and Varma, presented for a better understanding of the tool.

Value definition

Several modern psychologists such as Maslow (1959), Goldstein (1942) and Rogers Carl (1969) stress the central trend of human self-actualization. Maslow
(1959) speaks of “the human being as having within him a pressure towards unity of personality which is creative, co-operative and open to experience.”

The encyclopedia of social sciences refers to values as “interests, pleasures, likes, preferences, duties, moral obligations, desires, wants, needs and many other modalities of social orientation (Robin M. Williams: 1968).

Kluckhohn (1951) says that “values regulate impulse satisfaction, the requirements of both personality and socio-cultural system for order, the need for respecting the interests of others and of the group as whole in social living.”

All values contain some cognitive elements and they have a selective or directional quality. They serve as criteria for selection in action. In their most explicit form they become the criteria for judgment, preference and choice. In their implicit form they constitute grounds of decisions in behaviour.

It is extremely difficult to define as to what is desirable. Actually a conception of the desirable values which influence the selection from available modes turns out to be a definable preference for something to something else. Two mutually exclusive modes of behaviour or end-states are compared with one another, for e.g., responsible and irresponsible behavior.

The investigator also prefers a mode or end-state when he compares it with other values within his value system.

Baquer Mehdi (1986) states “we are too familiar with the distinction between what is desired and what is desirable. Values fall in the category of what is desirable.” Charles Morris (1986) talks of “the preferential behavior in values which in other words means a choice between the good and the bad.”

Cattell (1965) defines values thus: “By values we mean the social, artistic, moral and other standards which the individual would like others and himself to follow”. Cattell also states that most value attitudes are embedded in the self-sentiment and the super ego – structures.

The connotation of the term ‘value’ is the quality of anything that renders it desirable or something that is prized ‘held in respect’ deemed worthy, or esteemed. The dominant values that give meaning to a man’s life, making them the center around which actions revolve determine the type of person he will be.
According to Allport (1949) "A value is a belief upon which a man acts by preference."

Piriyanna (1952) states that "one of the distinguishing features of Indian philosophy is that it has consistently given the foremost place to values." Indian philosophy is essentially a philosophy of values. The Sanskrit word that stands for value is 'ista' the object of desire. Since man seeks his desires consciously the Indian philosophers term 'value' as purushartha or human value, meaning thereby ends consciously persuade by human beings.

Dictionary of Education (1959) defines the values as - "Things in which people are interested - things they want and desire to be or become or feel as obligatory, worship, enjoy".

Turner (1961) defines values as "objects which are regarded favorably or unfavorably".

Varma (1972) concludes that sociologists' approach to the conceptualization of value is not basically different from that of psychologists except in terms of value objects. Sociologists have chosen the value objects from the field of social traditions, practices and modes of action, which are important in the life of an individual vis-à-vis his social environment.

Charles Morries (1986) talks of "the preferential behaviour in values which in other words means a choice between the good and the bad".

Summarizing the above views, it can be stated that "a value is a principle, a standard or quality that is considered worthwhile or desirable. It is a consciously preferred choice of the concept of desirable behaviour, satisfying the needs and interests, having an element of stability and is validated by social approval. Such behaviour is standardized as norms, and constitute standards by which choices are evaluated".

Measurement of values

In the history of psychometry it was, at one time 'believed that social attitudes contained some essence that could not be identified and measured. People were sure that in making the attempt the psychometricians would measure only the trivia' Thurston (1959; p. 182).
Since Thurstone averred that values could be measured by means of psychometric methods with the help of a suitable non-physical metric several attempts have been made to measure values. The efforts of Allport- Vernon (1931), Precker (1952) Gordon (1956), Charles Morris (1957), Rosenberg, Morris (1957), Dennis (1961) and Super (1961) are noteworthy. In this country, most of the researchers have adapted Allport – Vernon – Lindzey ‘the study of values’ either in English or the regional languages notable are Ojha (1984), Ahlulwalia (1981), Verma, (1986) other tests on values are developed by Upadhyaya (1978), Aggarwal (1979), Chauhan and Aurora (1981), Bansal (1986), Aggarwal, Rekha Rani (1986), Katiyar (1982) as reported by Bhargav (1985). The need of a tool to asses human values in the indigenous cultural milieu has been felt for a long time in this country. The present tool ‘personal values questionnaire’ is an attempt in this direction.

Selection of values

Human values are innumerable. It is, therefore, a fond hope to survey the entire spectrum of values. Some eclectic approach was needed to delimit the scope of values to be measured by means of this tool. It was decided that literature on values was the universe from which the sample of values could be conveniently selected. One criterion for their selection was their frequent mention in the literature. Another criterion was their relevance to the indigenous social milieu. Under these two considerations the following ten values were selected for assessment.

Various values hereunder:

1. Religious value
2. Social value
3. Democratic value
4. Aesthetic value
5. Economic value
6. Knowledge value
7. Hedonistic value
8. Power value
9. Family prestige value

10. Health value

### 4.2.2 Preparation of items

The format of PVQ is that of a forced choice type with multiple choice items. A question consisted of two parts: (i) a stem, and (ii) 3 items. In the stem of the question a criterion situation for seeking the value preferences was depicted. The items depicted the values for which the respondent had to express his comparative preferences under the stimulus of the criterion situation. An example of a question is given below:

What kind of job do you like? (Stem) such a job in which you have:

1. Opportunity to make a lot of money
2. Control over men
3. Physical comfort and rest

In the preparation of the items of the PVQ the following considerations were kept in view.

1. The item should assess the designated value as validly as possible.
2. The three items under any stem should be relevant to the criterion situation depicted in the stem of the question.
3. The three items should be nearly equally attractive.
4. Each of the ten values should be matched with the remaining nine values evenly.

In the first draft of the PVQ were 75 questions and each value was compared with each of the remaining nine values five times. The consideration (2) was satisfied by asking a number of persons what they actually liked in a criterion situation. For example in the situation illustrated above it was asked: what considerations weight with you in choosing a job? In this way value items the corresponding items were selected from the literature.

In order to satisfy the consideration (3) only the most popular items to a stem as elicited from the respondents were not included in a question. Three such items
which were nearly equally mentioned by them were chosen. This mode of selecting the items helped in controlling the effect of social desirability.

The consideration (1) related to the validity of the items. What value did an item denote? This problem was solved by means of the judgment of the faculty members of women's training college, Dayalbagh. For example, in the illustrative example regarding the reasons for preferring a job, the judges agreed that the items denoted values as follows:

1. Opportunity to make a lot of money: economic value
2. Control over men: power value

Similarly items of each stem were assigned to the different values. The vague and irrelevant items were weeded out. In this way the first draft of PVQ was prepared.

4.2.3 Pre-try out

The PVQ was given three try-outs. The first try out (pre-try out) was done on a sample of 30 students of intermediate classes and 13 teachers of the secondary schools to find out:

1. If the language of the PVQ was intelligible and unambiguous to the responders.
2. If the responders followed the instructions clearly.
3. If some items were disproportionately attractive or unattractive.

They were instructed to record their preferences as follows:

1. Put a check mark (✓) against in item if it was the most preferred answer to the stem for you.
2. Put a cross mark (X) against an item if it was the least preferred answer to the stem for you.
3. Leave the third item unmarked.
4. Respond to all the questions without exception.
5. There is no time limit but record your responses as quickly as possible without pondering over a question.

The result of the pre - try out showed that 18 questions were not satisfactory at all. They were eliminated. The language of other questions was improved.

The second draft of the PVQ contained 62 questions and (62 X 3) 186 items. This draft was administered to a sample of 220 students (men-and women) of those colleges.

**Item analysis**

Two indices of item parameters were calculated in the development of the PVQ. Firstly the popularity value for each item was found out by means of the following formula:

\[
P.V. = \frac{\text{average score on an item}}{\text{maximum score allotted for the item}}
\]

For calculating P.V. the first preference items marked with (\(\checkmark\)) were given a score of 2, those marked with ( \(\times\) ) a score of 0 and the blank items ( ) a score of 1. Secondly triserial 'r' was calculated to find out the item - total correlations.

**Item selection**

The items were selected if their popularity value was found to lie between 200 and 800\(^1\) and also if it correlated significantly with the total score i.e., triserial value exceeded. 180 (p<0.01)\(^2\). On the bases of these two criteria 40 questions having 120 (40 x 3) items were selected. It may be mentioned here that a question was rejected even when a single item under it was found unsatisfactory.

**Final draft**

Thus the final draft contains 40 questions. Each value has an equal number of items and there are 12 items for each value.

**4.2.4 Scoring procedure**

The score was calculated according to the procedure. The procedure is given below.

The responses are to be scored as follows:
1. 2 for a check mark (✓) showing the most preferred value under the stem.

2. 0 for a cross (X) showing the least preferred value under the stem.

3. 1 for the blank ( ) or unmarked item showing the intermediate reference for the value.

Sometimes the respondents leave some questions unanswered. If the number of such questions is 4 or less, each item of the unanswered question should be scored as 1. If their number is more then 4th questionnaire will be rejected.

In all the cases the scores should be recorded beside the corresponding bracket and the total for each value (A to J) should be written in the cage given at the foot of the page. The correctness of scoring and recording of the totals for all the values is checked by summing the total for all of them on each page separately. If the grand total is 24 the scoring may be correct, provided that compensating errors have not been committed.

Finally the entries in the cage at the foot of each page should be brought to the bigger cage on the front page of PVQ. The total of each column should be noted down in the bottom row. These totals denote the scores of the respondent on the corresponding value given at the top of the column. In this questionnaire

1. A stands for the Religious value
2. B stands for the Social value
3. C stands for the Democratic value
4. D stands for the Aesthetic value
5. E stands for the Economic value
6. F stands for the Knowledge value
7. G stands for the Hedonistic value
8. H stands for the Power value
9. I stands for the Family prestige value
10. J stands for the Health value
Interpretation of raw scores

The raw scores can be used to denote the hierarchy of the ten value in the personality of an individual after making the corrections given below. The corrections are necessary because the means for the values are not equal for a large number of persons. This difference may be attributed to unequal attractiveness of the items of different values.

A correction figure for the raw scores of an individual is given in Table - 4.

**Table - 4**

A correction figure for the raw scores of an individual

<table>
<thead>
<tr>
<th>Areas</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correction</td>
<td>0</td>
<td>-4</td>
<td>-3</td>
<td>0</td>
<td>3</td>
<td>-2</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>-1</td>
</tr>
</tbody>
</table>

The plus correlations are to be added to the raw scores of an individual and the minus corrections are to be subtracted. For example if the raw score of social value (B) is 19 then his corrected score is $19 - 4 = 15$. Similarly if the raw score of a on the power value (H) is 8 his corrected score is $8 + 4 = 12$.

Interpretation of the derived scores

In order to interpret the derived scores, it is essential to fix up the score bounds for the qualitative categories. There is no universally accepted mode of conversion of the quantitative data into qualitative ones. Here an arbitrary scheme of conversion is given, but it may be considered as satisfactory for most purposes.

<table>
<thead>
<tr>
<th>T - scores</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 and above</td>
<td>Very high</td>
</tr>
<tr>
<td>55 - 64</td>
<td>High</td>
</tr>
<tr>
<td>46 - 54</td>
<td>Average</td>
</tr>
<tr>
<td>35 - 45</td>
<td>Low</td>
</tr>
<tr>
<td>34 and below</td>
<td>Very low</td>
</tr>
</tbody>
</table>
Administration of PVQ

The Telugu version thus prepared is administered on all the subjects of the sample \(N = 1200\) in the fore noon session. Necessary instructions are given to the pupils. For answering the items and with the help of lecturers the sheets are collected and scoring is done according to the weightage given by the author.

Reliability

Reliability of a tool is generally defined as the ratio of true variance to the scores (Guilford). The error variance component of the scores generated by a perfectly reliable tool is zero and there is no error or measurement. Hence reliability is one of the most important characteristics of a tool which denotes how accurately the tool measures whatever it measures.

Two indices of reliability of the PVQ were found out. Firstly, its reliability was determined by Hoyt's method using analysis of variance which method is as efficient as Kuder Richardson's but less cumbersome. Secondly, two test-retest reliabilities were determined one after the other in an interval of 11 months and the available at present and they are presented.

Evaluation of the reliability coefficient

It may be observed that the reliability coefficients obtained after a time gap of 3 months are fairly high. The well conceptualized religious and family prestige values have reliability coefficients of 82 and 85 respectively. The lowest reliability is for the power value (0.53). The reliability coefficients for other scales are in the neighborhood of 60. Now higher reliability coefficients increase the precision of measurement by reducing its standard error. But the measurement in the field of non-intellective personality variables cannot be as precise as that in the field of intelligence or achievement. Guilford (1954; p.388) says that the tools should be chosen even though their reliability may be of order of only 0.50. Judged from this consideration the reliability of PVQ seems to be good.

It is therefore, concluded that the PVQ is a reliable tool to measure complex variables such as values.
Validity

Although validity coefficients are liable to be deceptive and should not be accepted yet they prove to be useful indices of validity if the heterogeneity of sample and other factors are kept in view in obtaining them. The validity of PVQ was obtained by finding out the hierarchy of values of sample of 20 psychology students of B.A. part-II in two ways. Firstly they were administered PVQ and the hierarchy of their ten values were functionally defined in terms of the contents of the PVQ. The two hierarchies were correlated and the rank order coefficient of correlation of 64 was found. This correlation is significant at 0.05 level (df = 8). Thus it is may be said that the PVQ is a fairly valid tool to determine the hierarchy of values of a group. It may be remarked here that the foregoing evidence of the validity of PVQ is fairly strong.

A copy of the Telugu version of personal values questionnaire is presented in the Appendix - I.

A copy of the English version of personal values questionnaire is presented in Appendix - J.

The Answer sheet for personal values questionnaire is presented in Appendix - K.

4.3 STANDARD PROGRESSIVE MATRICES (R.P.M.)

To measure the intelligence of the Ss, the Standard Progressive Matrices prepared and standardized by Raven, J.C. (1950) was adopted.

The Standard Progressive Matrices set, A, B, C, D and E is a test of person's capacity at the time of the test to apprehend meaningless figures presented for his observation, see the relationship between them, conceive the nature of the figure, completing each system of the relation, presented and by doing so developed a systematic method of reasoning.

The scale consists of 60 items, divided into 6 sets. In each set the first problem is as nearly as possible self-evident.

4.3.1 Scoring

The number of scored responses out of 60 items in the test taken as the index of the subject's Intelligence.
The Answer sheet for standard progressive matrices test is presented in Appendix L.

4.4 PERSONALITY QUESTIONNAIRE

Personality of an individual plays an important role in his / her academic achievement. The review of related literature showed that there are a number of studies showing the relationship between personality and academic achievement at college level. Hence the investigator felt a need to investigate the relationship between personality of the student and its academic achievement particularly, the achievement in B.Ed. students. This motivated the investigator to search for a suitable personality questionnaire.

The investigator studied all the personality theories and searched for a suitable means of measuring the total behaviour of an individual and is convinced that Cattell’s theory, of all the various theories, is the only theory based on the principle of totality of behaviour of an individual.

4.4.1 Selection of the tool (16 PF) Form – C

Different psychologists have given different definitions for the term “personality”.

Personality is a dynamic organization within the individual of those psycho-physical systems that determine his unique adjustment to his environment (Allport 1949)

According to Cattell (1950), ‘personality is that which permits a prediction of what a person will do in a given situation’. One can not pass a Judgment over one’s personality, by just looking through one’s physique or sociability. One has to go carefully into all the aspects, biological and social and then only one can asses the personality of an individual. Sometimes some researchers and even psychologists fall easily into the mistake of settling, on a single test, dealing with any one dimension of personality, for example extroversion, self realization etc and from that they try to assess all kinds of behaviour, which is not advisable.

For the individual all aspects of behaviour, thought and feeling that make the person unique. For psychologists a major area of theory and research. (Derek Rowntree 1981)
It is obvious that selection of a tool for measuring personality poses serious problems. In this connection it may also be noted that the problem of justification of the choice looms large. One may cut a sorry figure in explaining for choice. This situation can be solved if we study the theory behind a particular tool and the rationale with which it was prepared. The selection of Cattell's 16PF test in the recent research was also not arbitrary and has been made after lot of deliberations and study of theory which has been supported amply by Stern (1921) and Allport (1937) in the following works.

Stern (1921) observes as; "we have the right and obligation to develop a concept of trait as a definitive doctrine, for in all activity of the person, there is besides a variable portion, likewise a constant purposive portion and this later we isolate as the concept of trait".

Allport's (1937) contention is equally forceful. He asserts that, "Traits are discovered not by deductive reasoning, not by faith, not by naming, and are themselves never directly observed. They are discovered only through an inference made necessary by the demonstrable consistency of the separate observable acts of behavior".

In view of the above theoretical as well as practical considerations Cattell's 16PF questionnaire was selected. The 16 PF questionnaires is an objectively acceptable test devised by basic research in psychology to give the most complete coverage of personality possible in a brief time. Coverage of personality is insured by the sixteen functionally independent and psychologically meaningful dimensions isolated by over twenty years of factor analytical research on normal and clinical groups. Therefore, having a certain position on one does not prevent the persons having any position whatever on any other. Thus, each of the sixteen scales brings an entirely new piece of information about the person, a condition not found in many alleged multi-dimensional scales.

Moreover, a scoring system is provided whereby, from the sixteen factors, one can extract and work with only four broader (and less specific) traits - anxiety, extraversion, alert poise and independence. Experience with 16 PF in clinical, educational and industrial psychology shows that the 16 traits gives actual prediction.
In view of the above theoretical as well as practical considerations Cattell's 16 PF questionnaire was selected.

4.4.2 The Factor headings of 16 Personality Factors

The Cattell's 16 PF questionnaire was used to measure the personality of the B.Ed. students, in the present investigation. The factor headings of 16 Personality Factors are given below.

**Factor - A:** Reserved, detached, critical, cool Vs. Outgoing, warmhearted, easy-going, participating.

**Factor - B:** Less intelligent, concrete thinking Vs. More intelligent, abstract thinking.

**Factor - C:** Affected by feeling, emotionally less stable Vs. Emotionally stable, calm, mature.

**Factor - E:** Humble, mild, accommodating, i.e., submissive Vs. Assertive, independent, aggressive, i.e., Dominance.

**Factor - F:** Sober, prudent, serious i.e., Desurgency Vs. Happy-go-lucky, Gay, enthusiastic i.e., Surgency.

**Factor - G:** Expedient, evades rules i.e., weaker super-egostrength Vs. Conscientious, preserving, rule bound, i.e. stronger super-ego strength.

**Factor - H:** Shy, restrained, timid i.e., Threctica Vs. Venturesome, socially-bold, i.e., Parnia.

**Factor - I:** Touch-minded, self-reliant, i.e, Harria Vs. Tender minded, dependent, sensitive i.e., Premia.

**Factor - L:** Trusting, adaptable, free of Jealousy i.e., Alaxia Vs. Suspicious, self-opinionated, hard to fool, i.e., Proseinson.

**Factor - M:** Practical, careful, conventional i.e., Praxermia Vs. Imaginative wrapped up in inner urgencies i.e., Autia.

**Factor - N:** Fortright, natural, artless, i.e, Artlessness Vs. Shrewd, calculating wordly i.e., Shrewdness.
Factor-O: Placid, self-assumed, confident i.e., untroubled adequacy Vs. Apprehensive, worrying; depressive, troubled i.e. Guilt proneness.

Factor-Q1: Conservative, tolerant of traditional difficulties, i.e., conservatism Vs. Experimenting, critical, free thinking i.e., Radicalism.

Factor-Q2: Group – dependent, sound follower i.e., Group adherence Vs. self – sufficient, resourceful, i.e., self-sufficiency.

Factor-Q3: Undisciplined, self-conflict, careless i.e., Low integration Vs. Controlled, socially precise, following self-image, i.e., High self-concept control.

Factor – Q4: Relaxed, tranquil, unfrustrated i.e., Low ergic tension Vs. Tense, Frustrated, driven, i.e., Ergic tension.

4.4.3 Adoption of the 16 PF questionnaire

The Cattell's 16 Personality Factor Questionnaire Form – C was adopted as a tool to assess personality of the B.Ed. students in the present study. In terms of personality factors measured, Form – C is exactly parallel to Form – A and B. Form – C based on an extensive factor analysis is a good test with maximum reliability and validity possible with only six items per factor. Form – C like Form – A and B, tests as much of the total personality as can be covered by a questionnaire. It gets at such basic independent factors as emotional stability, dominance etc. the 16 PF test leaves out no important aspects of total personality. Among personality tests, this is as pure a product of factor analysis as can be found. Each item has an appreciable saturation by one of the 16 source traits of ability, temperament and character integration as claimed by the authors. In addition, Form-C has the advantage of ease of administration and scoring. A note may be added about the Motivational Distortion (MD) scores. In the opinion of Cattell, most questions are designed to be as free as possible of value implications so that the persons will not be tempted to answer on any particular dimension for the sake of social approval. Still the likelihood of distortion in factor H and Q3 is recognized and a correction for these factors is suggested. The correction is done by taking away one point from factor H and to add one to factor Q3 if MD score exceeds twelve points (Cattell and Eber, 1962).
Form – C, being shorter in length than A or B is as effective as Forms A or B. It has an elementary vocabulary which most subjects would follow. The inclusion of index to guard against attempts at distortions of self-picture is an additional advantage. The growing evidence from a number of studies in various field suggest that the taking into account of all the 16 dimensions of personality gives a better prediction than what may be obtained by a single scale test. In this sense, the 16 PF questionnaire is that to be the most suitable for the present investigation.

“The sixteen dimensions or scales are essentially independent. Correlations between one and another dimension are usually negligible. Having a certain position on a dimension does not present a person from having any position what ever on another” (Cattell and Eber, 1962).

Moreover, in the 16 PF questionnaire, we do not interpret the factors from the nature of the subject’s statements about himself, but from the known correlations between these ‘mental interiors’ as found in questionnaire factors and the factor established in behavior. In other words, the question responses are treated as behavior not as valid self ratings.

Thus, the 16 PF questionnaire Form – C of 1969 was adopted for the present investigation to asse the personality of the B.Ed. students. The B.Ed. students are writing their examinations in Telugu version hence, the Telugu version of 16 PF is also adopted, which was prepared by Manchala, C. (2007), Department of Education, S.V.University, Tirupati. A copy of the Telugu version of the 16 PF questionnaires Form – C is given in Appendix – M. A copy of the English version of the 16 PF questionnaires Form – C is given in Appendix – N.

4.4.4 Scoring procedure for 16 PF questionnaire Form – C

In the 16 PF questionnaire, three alternative answers are given to each question. The subjects are motivated to give only one answer for each question. A preliminary observation was made to know whether there is more than one answer or not to each question in the answer sheet. Then the answers are scored according to the weightages given by the author. The scoring was done for each individual B.Ed. student and for each factor. The answer sheet for 16 PF questionnaire Form – C is shown in Appendix – O. The scoring key for 16 PF questionnaire Form – C is shown in Appendix – P.
4.4.5 Reliability and Validity

For computing reliability and validity, the procedure suggested by Garrett (1973) was followed. Reliability of each factor (based on raw scores) as obtained by Test – Retest method and validity which is the square root of reliability, are presented in Table – 5. The retest was conducted on a sample of 200 with a gap of 15 days for test and retest.

Table – 5

Reliability and Validity of 16 PF Form – C using Test – Retest Method

<table>
<thead>
<tr>
<th>Factor</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>0.654</td>
<td>0.715</td>
<td>0.582</td>
<td>0.735</td>
<td>0.787</td>
<td>0.687</td>
<td>0.751</td>
<td>0.764</td>
</tr>
<tr>
<td>Validity</td>
<td>0.809</td>
<td>0.846</td>
<td>0.763</td>
<td>0.857</td>
<td>0.887</td>
<td>0.829</td>
<td>0.867</td>
<td>0.874</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>0.646</td>
<td>0.666</td>
<td>0.714</td>
<td>0.701</td>
<td>0.576</td>
<td>0.602</td>
<td>0.751</td>
<td>0.712</td>
</tr>
<tr>
<td>Validity</td>
<td>0.804</td>
<td>0.816</td>
<td>0.845</td>
<td>0.837</td>
<td>0.759</td>
<td>0.776</td>
<td>0.867</td>
<td>0.844</td>
</tr>
</tbody>
</table>

Table – 6

Reliability and Validity of 16 PF Form – C using Split – Half Technique

<table>
<thead>
<tr>
<th>Factor</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>0.665</td>
<td>0.738</td>
<td>0.602</td>
<td>0.744</td>
<td>0.714</td>
<td>0.698</td>
<td>0.659</td>
<td>0.698</td>
</tr>
<tr>
<td>Validity</td>
<td>0.815</td>
<td>0.859</td>
<td>0.776</td>
<td>0.863</td>
<td>0.845</td>
<td>0.835</td>
<td>0.812</td>
<td>0.835</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>0.684</td>
<td>0.675</td>
<td>0.705</td>
<td>0.695</td>
<td>0.605</td>
<td>0.615</td>
<td>0.726</td>
<td>0.713</td>
</tr>
<tr>
<td>Validity</td>
<td>0.827</td>
<td>0.822</td>
<td>0.840</td>
<td>0.834</td>
<td>0.778</td>
<td>0.784</td>
<td>0.852</td>
<td>0.844</td>
</tr>
</tbody>
</table>
Reliability of the sub-tests of each factor (based on raw scores) as obtained by Split – Half Technique and validity which is the square root of reliability, are presented in Table – 6. The Split – Half reliability was calculated on a sample of 300.

4.5 SELECTION OF TEACHER ATTITUDE INVENTORY (T.A.I.)

An attitude is an affect, a dynamic trait, a behaviour pattern, an anticipatory set or tendency, predisposition, conditioned response, implicit response, disposition and mental and neural state of readiness. Many of the aforesaid terms described the nature of attitude as a mental state of readiness of feeling of an individual towards a certain object.

Allport (1949) defined attitude as, "a mental and neural state of readiness organized through experience exerting a directive or dynamic influence upon the individual’s response to all objects and situations."

Cattell (1950) defined attitude as, “a dynamic trait commonly arising from some deeper sentiment or innate drive which it seeks to satisfy. It is a readiness to implement a certain course of action in regard to some object”.

Guilford (1954) defined as, “a personal disposition common to individuals, but possessed to different degrees, which implies them to react to objects, situations or propositions in ways that can be called favourable or unfavourable”.

Finally it may be said that an attitude is a mental set or state of readiness, which an individual holds in relation to his society towards a psycho-social object. Thus the study of attitude is the study of relation or correspondence of mental and social feelings of individuals in a society and the object towards which the feeling is held is a psycho – social object.

Thus, if the student is asked whether he likes or dislikes a certain object or course of action, his endorsement measures the strength of the attitude vector. The direction of the attitude vector is fixed to some extent by the description of course of action of which the person is far or against.

Moreover, two individuals having equal favourable attitude towards an object may not act in the same way because they may arrive at the same level of attitude by entirely different routes and their factual association with the psychological object may also differ.
It is assumed that favourable attitude of the student teachers/prospective teachers towards teaching profession and teacher training leads to better scholastic achievement in B.Ed. course and in turn leads to teaching success in future. To become a successful teacher in future, it is expected that the student-teachers have a favourable attitude towards the teaching profession and teacher training. Teacher training programme is that kind of an experience which should give sufficient and suitable theoretical and practical experiences to the student teacher for his/her becoming a teacher. In this connection, it may be stated that instead of admitting a candidate with unfavourable attitude or neutral attitude towards the profession and training, it is better to admit a candidate with a favourable attitude. Then, the training gives better results than in the former case.

The review of related literature revealed that the studies on the relationship of attitude towards teaching profession, teacher training and scholastic achievement of B.Ed students are rarely found. Hence there is a need to study the relationship between attitude towards teaching profession, teacher training and scholastic achievement of B.Ed students.

Construction of the Preliminary Form

The purpose of constructing the teacher attitude inventory (TAI) is to study the relation of attitude of B.Ed. students towards teaching profession and teacher training with the achievement in university theory and practical examinations, and with the total achievement (theory plus practical) in university examinations.

The teacher attitude inventory (TAI) is divided into two sections to measure the attitudes of B.Ed. students i.e., (A) attitudes towards teaching profession and (B) attitudes towards teacher training.

4.5.1 Adoption of the teacher attitude inventory

The teacher attitude inventory consists of 51 items of which 23 are positive and 28 are negative. Thus, the teacher attitude inventory of 2005 was adopted for the present investigation to assess the attitude towards teaching profession of the B.Ed. students. The B.Ed. students are writing their examinations in Telugu version hence, the Telugu version of teacher attitude inventory is also adopted. Which was prepared by Manchala, C. (2007), Department of Education, S.V.University, Tirupati. A copy of the Telugu version of the teacher attitude inventory is given in Appendix – Q.

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copy of the English version of the teacher attitude inventory is given in Appendix - R. The Answer sheet for teacher attitude inventory is presented in Appendix - S.

4.5.2 Scoring Procedure

For the purpose of scoring numerical values were assigned to each of the five categories namely Strongly Agree (SA), Agree (A), Doubtful (D), Disagree (DA) and Strongly Disagree (SDA). The numerical values for positive and negative statements are shown in Table – 7.

Table – 7:

<table>
<thead>
<tr>
<th>Item</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree (S.A)</td>
</tr>
<tr>
<td>Positive</td>
<td>5</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
</tr>
</tbody>
</table>

There are 48 positive statements and 41 negative statements. Item number 1, 2, 3, 4, 5, 9, 10, 13, 14, 18, 19, 22, 24, 25, 26, 27, 34, 35, 36, 37, 38, 39, 40, 48, 49, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69, 71, 75, 76, 77, 79, 83, 88 and 89 are positive statements and the negative statements are 6, 7, 8, 11, 12, 15, 16, 17, 20, 21, 23, 28, 29, 30, 31, 32, 33, 41, 42, 43, 44, 45, 46, 47, 50, 51, 52, 53, 68, 70, 72, 73, 74, 78, 80, 81, 82, 84, 85, 86, 87.

4.5.3 Validity of the Scale

The same procedure what was followed for establishing the validity of the OAT was also followed for establishing the validity of the TAI. (1) Content validity, (2) Item validity, (3) Intrinsic validity, (4) Face validity, (5) construct validity and (6) Concurrent validity and predicative validity of the TAI were established.

Intrinsic Validity

Guilford (1954) defined intrinsic validity as, “The degree to which a test measures what it purports to measure”. This can also be stated in terms of how well, the obtained scores measure the test’s true score component. This validity is given by the square root of its reliability. Hence the intrinsic validity of the TAI is 0.938.
4.5.4 Reliability

The reliability of the TAI is found by employing (1) Test – Re test method on sample of 250 with a gap of 15 days for re – test and (2) Split – half technique. The reliability coefficients of the TAI are given in Table – 8.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of reliability</th>
<th>Magnitude of reliability</th>
<th>Attitude towards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Test – Re test method</td>
<td>0.90</td>
<td>0.92</td>
</tr>
<tr>
<td>2.</td>
<td>Split half technique</td>
<td>0.88</td>
<td>0.89</td>
</tr>
</tbody>
</table>

The magnitude of co – efficient of correlation in the above two methods is more than 0.88. Hence the reliability of the TAI is very high.

4.5.5 Administration of teacher attitude inventory

The Telugu version of SCS is administered on all the subjects (N=1200) of the sample, in the forenoon session of the school. Necessary instructions for answering the items are given to the students. Teacher’s help is taken in conducting the test and collecting all the data sheets. Scoring is done according to the weightage, given by the Author.

4.6 SOCIO – ECONOMIC STATUS (S.E.S.) SCALE

Among social factors, socio – economic status (SES) is an important one. The SES influences values, norms of behaviour, motivation for improvement, social participation etc.

4.6.1 Selection and Adoption of SES scale

In India, sociologists have generally utilized multiple criteria in establishing SES scales. A common scale to measure the SES of urban families is the one devised
by Kuppuswamy (1962) is of recent origin. A common SES scale for rural and urban areas was constructed by Aaron, P.G., Marihal, V.G. and Malathisa, R. N., and published in the year 1974. For the present study, this common SES scale is selected as the B.Ed. students hail from rural and urban areas. Following is the brief description about the SES scale.

The authors emphasized three ideas which influenced the construction of SES scale.

1. The information elicited should be simple as far as possible and reliable.

2. As far as possible, similar rural and urban sources should be tapped to provide information regarding their respective SES.

3. The ultimate aim of the scale is to identify and isolate groups of rural and urban people of similar SES.

The variables used in this scale have been tested by other researchers and the combinations of these and other indicators are correlated well with measures of attitude and behaviour. Of the five variables, one refers to father's occupation, another to father's education, and the other three to material possessions. Since children may not have accurate information regarding parent's income, material possession had been introduced in its place. Regarding the weightages given to the various items under five categories, the authors followed trial and error method of revising the weights in a systematic way in order to obtain a normal distribution of the SES scores of rural and urban distributions. By this, they arrived at a stage where the chi-square values obtained for rural as well as urban distribution did not turn out to be significant at 0.05 level. The weights assigned at this stage to different items were fixed. This SES scale is given in Appendix - T.

4.6.2 Scoring procedure

There are five categories, viz. occupation of father, father's education, material possession, house, shirts or blouses in the socio-economic survey index. The subject is given a score under each of these categories so that the final SES index is the total of these scores. Only the maximum possible score is considered under each category. The score of course depends upon the weightage of the item. For instance, under category - III, the subject may possess a cycle as well as a radio and no other
material. Cycle has a weightage of 2 and radio has a weightage of 5, so the subject’s score under this category is 5. Eventually the scores of all the five categories are added and this represents the SES index. The scoring key of SES scale is shown in Appendix – U.

4.6.3 Validity and Reliability

The validity and reliability for the entire SES scale was established the concurrent validity of the scale was obtained by finding out to what extent the scores obtained by pupils on the SES scale correspond to an outside criterion i.e., the SES score assigned by the teacher of the class where the pupils were studying. The Pearson’s Product Movement Correlation Coefficient was computed. The Validity and reliability coefficients reported by the authors were as follows.

Concurrent validity (N = 28) : 0.61 Significant beyond 0.01 level.

Test – Retest Reliability (N = 23) : 0.77 Significant beyond 0.01 level.

The investigator also found the test – retest reliability on a sample of 200 B.Ed. students with a gap of 15 days for the retest. The magnitude of test – retest reliability was 0.86. Thus the SES scale is highly reliable.

4.7 SOCIO-DEMOGRAPHIC SCALE

The socio – demographic scale prepared by the investigator with the help of experts in the field of education consists of the following particulars, with regard to the pupil’s personal, socio – demographic variables.

1. Region,
2. Management,
3. Gender,
4. Caste,
5. Locality,
6. Marital status,
7. Educational qualification,
8. Methodology,
9. Type of the Family,
10. Age,
11. Annual Income of the Family,
12. Father’s Education,
13. Father’s Occupation,
14. Mother’s Education,
15. Mother’s Occupation,
16. Number of children in the family,
17. Number of members in the Family,

Socio–demographic scale is shown in Appendix – V.

4.8 FINAL STUDY

The final study is conducted after the construction and standardization of all the tools and adoption of the tools as described in the preceding pages.

4.8.1 Selection of sample for final study

The sample for the investigation consisted of 1200 B.Ed. college students. The stratified random sampling was applied in three stages. Geographically Andhra Pradesh state is divided into three regions namely Telangana, Rayalaseema and Coastal. Three districts in each region was selected at random. Warangal, Ranga Reddy and Hyderabad districts are taken from Telangana region, Chittoor, Kurnool and Kadapa districts are taken from Rayalaseema region and Vishakhapatnam, Guntur and West Godavari Districts are taken from Coastal region. In the next stage two colleges in each district were selected (one Government and one Private college). In the next stage 100 male and 100 female B.Ed. students from colleges. In total 600 male and 600 female students included in this study. It is a 3X2X2 factorial design with 1200 sample subjects. The sample design for the study is presented in Table – 9.
4.8.2 Administration of Tools

Having selected the colleges, following stratified random sampling method, the investigator consulted the heads of institutions selected, personally and explained them, the purpose of the test and took their permission for holding the test. The test dates for different colleges were intimated sufficiently in advance. The students were thoroughly motivated for the tests and they were given proper instructions for answering the different sets of test tools. The investigator visited all the colleges personally, as decided and intimated earlier. In the morning session, the sets of socio-demographic scale, personal values questionnaire, teacher attitude inventory, Cattell 16 PF questionnaire, intelligence and socio-economic status are given to the students and with the help of lecturers of concerned colleges, the tests are administrated. In the afternoon session, the OAT paper is given to the students. Thorough inspection is made with the help of concerned college lecturers, when the students are answering the different test tools. The students who attended the college on the day of collection of data are considered for the purpose of investigation. All the data gathering instruments are collected from the students and they are evaluated following the weightages given by the test constructing authorities concerned. All the collected data are given for statistical analysis. Scoring is done as already explained in the preceding pages, under each tool. The data on each variable is properly coded to suit for computer analysis. Geographical map showing in Andhra Pradesh, selected districts and B.Ed. colleges is given Figure – 2.
Figure 2
Geographical map showing in Andhra Pradesh, selected Districts and B.Ed. colleges

- Visakhapatnam
- West godavari
- Guntur
- YSR
- Chittoor
- Kurnool
- Ranga reddy
- Hyderabad
- Warangal

* Government B.Ed College
● Private B.Ed College
4.9 STATISTICAL ANALYSIS

On the basis of the objectives of the investigation, statistical analysis is carried out by employing appropriate statistical techniques.

Frequency distribution tables, on the academic achievement are prepared for the total sample, for different regions, managements and gender. Measures of central tendency, measures of dispersion, skewness, kurtosis, co-efficient of variation and standard error of mean are computed and used wherever necessary. The inferential statistical techniques like ‘t’ test and ‘F’ tests are employed to test the different Hypotheses. Multiple “R” is computed by carrying out, step - wise regression analysis to find out, whether it would be possible to predict academic achievement of B.Ed. students. The obtained numerical values are adumberated by graphical representations. For dividing the groups, quartile values and sten values are used wherever necessary. Sufficient number of tables are prepared.

For Statistical Formulae, the Following text Books were consulted:

➢ “Statistical Methods for research workers” by Fisher (1950).

The significant levels employed with respective symbols are given here under:

** Indicates significant at 0.01 level
* Indicates Significant at 0.05 level
@ Indicates in-significant at 0.05 level