Chapter IV

METHODS OF INVESTIGATION
METHODS OF INVESTIGATION

This chapter deals with the different procedures followed in the construction and development of data gathering instruments on different variables which are included in the study and the methods adopted in the selection of the samples, collection of data, scoring, and analysis.

4.1 The Design of the Study

The present study is essentially explorative and descriptive in nature. On the basis of the general survey, the design of the study may be called a survey type of research.

4.2 Measurement of Variables and Development of the Tools

As it has been described earlier, it is proposed to study the attitudes of students, teachers, and administrators on different aspects of vocationalisation of education. Therefore, three attitude scales meant for the three groups are to be developed. Of course, to collect the data pertinent personal and demographic variables of students, teachers, and administrators are also to be developed. The procedures adopted in the development of each one of the above is described in the following pages.
4.2.1 Attitude, meaning and definitions

Attitude is a familiar word and is used freely to express one's way of thinking, feeling or behaving. It has been used by psychologists in several connotations and there are a number of agreed definitions of the term. Allport (1929) defined it as a mental or neural state of raciness organised through experiences exerting a directive or dynamic influence upon the individual response to all the objects and situations with which it is related.

This definition stresses that attitude is a generalized pattern of perception or action which is the result of integration of various experiences.

In the dictionary of philosophy and psychology Baldwin (1901) defined attitude as readiness for attention or action of a definite sort.

By attitude we understand a process of individual consciousness which determines real or possible activity of the individual counterpart of the social value activity in whatever form is the bond between them.

(Thomason and Znamiecki, 1981, p 27)

In the words of Lundberg (1929) an attitude denotes the general set of the organism as a whole toward an object or situation which calls for adjustment.
Kohler (1929) remarked that an attitude involves a definite psychological stress exerted upon the sensory field by processes originating in other parts of the nervous system.

Attitude is a tendency to act toward or against something in the environment which becomes there by a positive or a negative value.

(Bogardus 1931)

Droba (1933) opined that an attitude is a mental disposition of the human individual to act for or against a definite object.

Attitudes are literally mental postures guides for conduct with each new experience referred before a response is made.

(Morgan 1936)

In the dictionary of Psychology attitude is defined as the specific mental disposition in coming experience whereby that experience is modified for a condition of readiness for certain type of activities.

(Warren, 1934)

Gunford (1954) defined attitude as a personal disposition common to individuals but possessed in different degrees which implies to react to object situations in ways that can be called favourable or unfavourable.

According to Freeman (1968) an attitude is a dispositional readiness to respond to certain situations persons or objects in a constant manner which has been learned and has become one’s typical mode of response.
All the definitions cited above give importance to the degree of liking or disliking towards a psychological object and in line with above Thurstone (1944) defined attitude as the degree of positive or negative effect associated with some psychological object.

Though attitude and opinion are allied terms they are not synonyms. Attitude denotes the inner feeling or belief of a person towards a psychological phenomenon. Opinion is a verbal expression of an attitude.

4.2.2 Different Methods of Measuring Attitudes

Attitudes can be measured in several ways. They are revealed in the behaviour of an individual. They can be measured by direct observation of overt behaviour of the individual. This has all the defects of observation in addition to the difficulty of experimentally creating a real situation wherein behaviour can be observed.

Projective technique can also be used to assess an individual's attitude. The basis for the use of projective techniques to measure attitude is that attitude can be inferred by one's unconscious responses to certain stimuli like photographs, cartoons, etc. This method also has the disadvantages of observation techniques like difficulty in administration, scoring, low inter scorer reliability, etc.
The most common method of estimating a person’s attitude is through a questionnaire where the individual expresses his opinion on several controversial statements on some psychological object. The logic behind the use of opinion to measure attitude is the positive correlation between what people say about a subject and what they will do about it. To the extent people’s actions correlate with their expressed opinion, we can predict the former from the latter. Any single action, however, will be extremely unreliable from the point of view of treatment. A person’s particular actions cannot be predicted with a high degree of accuracy yet one’s attitude can be assessed.

This method of assessing attitude from expressed opinion is also subject to some limitations like faking of responses by the individual where he tends to give socially acceptable response thereby concealing his real attitude. But this could be overcome in several ways like making the questionnaire anonymous.

The two most well-known methods of measuring attitude directly by the attitude scale are

A. Thurstone’s method of equal appearing intervals and
B. Likert’s method of summated ratings

A. Thurstone’s Method of Equal Appearing Intervals

Thurstone’s proposal to measure the attitude by statements scaled by the method of equal appearing intervals would apply. A large number of favourable and unfavourable statements on the issue under investigation are written and given to a number of judges (subjects experts) to sort them out.
at their face value. The items which bring disagreement among the judges have been discarded. For the remaining items, scaled values have been found out with the help of ogives. The respondent is to give his reaction to each statement by accepting or rejecting it. The mean values of the statement that he/she checks establishes his scores or quantifies his attitude.

B Likert's Method of Summated Ratings

It is considered as an improvement over Thurstone's method. The first step in this method is a collection of a number of items. They must express definite favourableness or unfavourableness to a particular viewpoint and their number should be approximately equal. A trial test would be administered to a number of subjects and only those items that correlate with the total test should be retained. Five alternative responses: strongly agree, agree, undecided, disagree, and strongly disagree are given, and the scaled values are given to each of the five responses. For positive items, it is from 6 to 1 and for negative items, it is from 1 to 5. The total of these scores on all items measures a respondent's favourableness or unfavourableness towards the subject in question.

Thus, the attitude of any person towards any subject can be estimated or measured by either of these methods. In the present study of measuring the attitude of students, teachers/lecturers, and administrators towards vocationalisation of education, Likert's method of summated ratings has been used.
4.2.3 Attitudes of Students towards Vocationalisation of Education

Vocational programmes and courses are provided in the following streams.

The first stream is the process of vocationalising General Education at least in some identified high schools and junior colleges (+2) with the vocational element introduced along with the normal course of study. This component of vocational education is only a secondary or a supplementary skill-oriented education. Due to the specially trained teachers and required infrastructural facilities, lack of practical exposures to the teachers and students, lack of motivation among students and lack of faith on the part of the parents, in these programmes, the process of vocationalisation of education through the existing institutions of General Education has become almost null and void.

The other streams comprise the specific institutions of vocational education viz. Industrial Training Institutions Polytechnics Nurse Training Courses Teacher Training Courses Computer Training Institutions etc. and even in these institutions, deficiencies have been observed in different aspects of vocational education.

4.2.3.1 Preparation of the Preliminary Form for Students

There is no suitable standardized tool to measure the attitude of the students towards vocationalisation of education. In view of this, the investigator has to develop an attitude scale to suit his purpose. For the purpose of preparing the Preliminary form, first the nature and scope of the
statements that have to be included in the proposed attitude scale have been examined in the light of the operational definition of the concept of students' attitude towards vocationalisation of education which have been pooled together from the available literature. The statements have been further supplemented with interviews with a good number of lecturers, senior lecturers, principals, administrators, and students. They have been asked to list either favourable or unfavourable statements that are supposed to indicate one's attitude towards vocationalisation of education. The statements thus obtained have been scrutinised by 5 experienced researchers. The suggestions given by them have been reviewed and rewritten. The preliminary statements thus prepared constitute 98 statements of which 36 are positive and the remaining are negative. This has been presented to a panel of 25 experts (comprising 5 teachers, 5 lecturers, 5 principals, and 10 students) with a request to suggest improvements wherever necessary and the suggestions of the experts have been duly carried out. Among these 90 statements thus selected for pilot form, 32 statements are positive and the remaining ones are negative. The pilot form of the scale shown in Appendix A₁, which is translated into Telugu for the purpose of administration is shown in Appendix in A₂.

4.2.3.2 Pilot Study

The pilot form of the attitude scale thus formulated has been administered to 150 students from three regions: one High School, one Junior College (with vocational courses), one Industrial Training Institute, and one Polytechnic in each region (i.e., Coastal Andhra, Telengana, and...
The investigator has selected the students from the above institutions at random in order to examine whether the statements are easily understood by them or not and to know whether they possess clarity or not. The responses are scored by giving appropriate weightages as described below for the purpose of scoring of the statements numerical values are assigned to the five categories of responses (Weightages) against each statement.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Nature of response</th>
<th>Numerical Value assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive statement</td>
</tr>
<tr>
<td>1</td>
<td>Strongly Agree</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Agree</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Undecided</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Disagree</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
</tbody>
</table>

On the basis of weightages total scores have been obtained on the scale to all the 150 subjects. The top 27 per cent and the bottom 27 percent of the subjects have been identified as criterion groups and the mean scores obtained by these two groups on each item have been calculated. The difference between the mean scores is discrimination value or Item validity Index (Edward 1969) The detailed table showing discrimination index is presented in Appendix A.

4233 Preparation of the Final Form

Out of the 90 items in the final form only 73 (22 positive and 51 negative) have been selected for the inclusion in the final form of the attitude.
scale meant for students depending upon the discrimination value of each item. Those items of whose discrimination index is 0.3 and above have been selected for the final form. Both English and Telugu versions of the final form of the attitude scales are presented in Appendices A_4 and A_5.

4.2.3.4 Reliability of the tool

An attitude scale has been developed to measure the attitudes of specific group of individuals representing a specific category. In order to find out effectiveness of the attitude scale developed, the test-retest reliability has been examined by obtaining scores for the tool with an interval of three weeks between the first and the second administration of the scale to the same set of 60 students. The correlation coefficient between the two sets of scores is 0.845 which is significant at 0.01 level. Hence the scale may be considered as having high reliability.

4.2.3.5 Validity of the Scale

Validity is another criteria considered to estimate the appropriateness of any tool developed to examine a particular aspect of an individual's attitude. The attitude scale of the present study developed on the lines described above indicates satisfying content validity, item (statement) validity and intrinsic validity. The details relating to them are described as follows.

(i) Content Validity

Content validity refers to the establishment and evaluation of the significance of the test items individually and as a whole. Every item should be a sample of that aspect which the test purports to measure. In addition, items should collectively constitute a representative sample of the variable that is measured.
As already described, the items have been collected from different sources viz. review of literature, principals, lecturers, and students. In addition, it has also been supplemented by interviewing select learners and experts to make sure that all possible items have been covered. Thus, it can be reasonably assumed that the attitude scale thus developed possesses satisfactory content validity.

(i) Item Validity

Item validity stresses the number of discriminations of the desired sort that the item is capable of making. It stresses the extent to which the item of the present scale has been established as explained earlier. Thus, the items chosen for the scale have been found out to be satisfactorily valid.

(ii) Intrinsic Validity

According to Guilford (1954), intrinsic validity indicates the degree to which the test measures what it purports to measure. In other words, this means verification of how well the obtained scores measure the test-true score component. Intrinsic validity of a test is expressed in terms of the square root of its reliability value. Thus, the intrinsic validity of the attitude scale developed is $\sqrt{0.845} = 0.919$, and it can be assumed as a highly satisfactory intrinsic validity.

4236 A Brief Description of the Final Form of the Attitude Scale

The final form of the attitude scale in the lines described above consists of 73 items of which 23 items are positive and 51 are negative. Each item can be rated on any of the five response categories viz., strongly agree, agree,
undecided disagree and strongly disagree which carry numerical values 5 4 3 2 and 1 for positive statements and 1 2 3 4 and 5 for negative statements. The score for a respondent on the scale can be obtained by summing up the weights of the individual items responses which vary from 73 to 365.

4.2.4 Preparation of the Preliminary Form for Teachers/lecturers and administrators

There is no suitable standardized test to measure the attitude of the teacher/lecturer's and administrator's of vocationalisation of education. In view of this, the investigator has to develop an attitude scale to suit the purpose. For the purpose of preparing the preliminary form, first the nature and scope of the statement that have to be included in the proposed attitude scale have been examined in the light of the operational definition of the concept of teachers/lecturers and administrators attitude towards vocationalisation of education. All the favourable and unfavourable statements that are likely to indicate the attitude of teachers/lecturers and administrators towards vocationalisation of education are pooled together from the available literature. The statements have been further supplemented by interviews with a good number of lecturers, senior lecturers, principals and administrators and students. They are asked to list either favourable and unfavourable statements that are supposed to indicate their attitude towards vocationalisation of education. The statements thus obtained have been scrutinised and the relevant ones are chosen and added to the list. After this in order to avoid ambiguity and overlapping all the statements have been
reviewed and re written. The preliminary form thus prepared constitutes 105 statements of which 39 are positive attitude and the remaining are negative. This has been presented to a panel of 20 experts (comprising 5 teachers, 10 lecturers and 5 principals) with a request to suggest improvements wherever necessary and the suggestions of the experts have been duly carried out. In all, 99 statements have been selected for pilot form of which 31 statements are positive and the remaining are negative. The tool is translated into Telugu for the purpose of administration. Both English and Telugu versions of the tool are shown in appendices B₁ and B₂.

4.2.4.1 Pilot Study

The pilot form of the attitude scale thus formulated has been administered to 75 vocational teachers/lecturers and administered at district and regional levels in three regions one High School one Junior College (with vocational courses) one industrial training institution and one Polytechnic college from each region (e.g. Coastal Andhra Telengana and Rayalaseema). The investigator selected at random in order to examine whether the statements are easily understood by them or not and to know whether they possess clarity or not. The responses are scored by giving appropriate weightages as described below for the purpose of scoring of the statements. Numerical values are assigned to the five categories of responses (Weightages) against each statement.
On the basis of weightages, total scores have been obtained on the scale to all the 75 subjects. The top 27 per cent and the bottom 27 per cent of the subjects have been identified as criterion groups and the mean scores obtained by these two groups on each item have been calculated. The difference between the mean scores is discrimination value or item validity index (Edward 1969). The detailed table showing discrimination index is set out in appendix B3.

4.2.4.2 Preparation of the Final Form

Out of 99 items in the pilot form only 86 (24 positive and 62 negative) have been selected for the inclusion in the final form of the attitude scale meant for teachers/lecturers and administrators depending upon the discrimination value of each item. Those items whose discrimination index is 0.3 and above have been selected for the final form. Both English and Telugu versions of the final form of the attitude scale are presented in appendices B4 and B5 respectively.

4.2.4.3 Reliability of the tool

An attitude scale has been developed to measure the attitude of specific group of individuals representing a specific category. In order to find out effectiveness of the attitude scale developed, its test-retest reliability has
been examined by obtaining scores for the tool with an interval of three weeks between the first and the second administration of the scale to the same set of 40 teachers/lecturers and administrators. The correlation coefficient between the two sets of scores is 0.785 which is significant at 0.01 level. Hence the scale may be considered as having high reliability.

4.2.4.4 Validity of the Scale

Validity is another criteria considered to estimate the appropriateness of any tool developed to examine a particular aspect of an individual's attitude. The attitude scale of the present study developed on the lines described above indicates satisfying content validity, item (statement) validity, and intrinsic validity. The details relating to them are described as follows.

(i) Content Validity

Content validity refers to the establishment and evaluation of the significance of the test items individually and as a whole. Every item should be a sampling of that aspect which the test purports to measure and the items should collectively constitute a representative sample of the variable that is measured.

As already described, items have been collected from different sources viz., review of literature, principals, lecturers, senior lecturers, and university teachers. In addition, it has also been supplemented by interviewing selected learners and experts to make sure that all possible items are covered. Thus it can be reasonably assumed that the attitude scale developed possesses satisfactory content validity.
(ii) Item Validity

Item validity stresses the number of discriminations of the desired sort that the item is capable of making. It stresses the extent to which the item of the present scale has been established as explained earlier. Thus the items chosen for the scale have been found to be satisfactorily valid.

(iii) Intrinsic Validity

According to Guilford (1954) intrinsic validity indicates the degree to which the test measures what it purports to measure. In other words, this means verification of how well the obtained scores measure the test true score component. Intrinsic validity of a test is expressed in terms of square root of its reliability value. Thus, the intrinsic validity of the attitude scale developed is \( \sqrt{0.705} = 0.886 \) and it can be assumed as a highly satisfactory intrinsic validity.

4.2.4.5 A Brief Description of the Final Form of the Attitude Scale

The final form of the attitude scale in the lines described above consists of 86 items of which 24 items are positive and 62 are negative. Each item can be rated on any of the five response categories viz. strongly agree, agree, undecided, disagree, and strongly disagree which carry numerical values 5, 4, 3, 2, and 1 for positive statements and 1, 2, 3, 4, and 5 for negative statements. The source for a respondent on the scale can be obtained by summing up the weightages of the individual items responses which vary from 86 to 430.
4.25 Personal Data Sheet

The personal information regarding the students, teachers/lecturers and administrators have been collected through a well-planned personal data sheets meant for the three sub-samples separately. A carefully worded personal data sheets have been added at the end of the tools meant for the three categories of subjects and those sheets could be seen in Appendix C1 and C2.

4.3 Selection of the Sample

As the investigation aimed at studying the attitudes of students, teachers/lecturers and administrative staff involved in vocational education in the state of Andhra Pradesh, a representative sample of the three categories of subjects is essential. The sampling technique employed in investigation is a stratified multi-stage random sampling technique.

The state of Andhra Pradesh is divided into three regions viz. Rayalaseema, Coastal Andhra, and Telangana. At the first stage, the sampling unit is the district. One district from each one of the three regions is selected at random.
Vocational education is being provided in High Schools, Junior Colleges, Industrial Training Institutions (ITIs), and Polytechnic Colleges. The first two types are institutions of General Education or providing vocational courses whereas the latter two types of Institutes are exclusively meant for providing vocational courses. Keeping this in view and to give representativeness to all categories of High Schools, Junior Colleges, Industrial Training Institutes (ITIs), and Polytechnics have been selected at random, treating them as a sampling unit. Thus, from each district, 28 Institutions of the four types and in total, 84 Institutions are included in the sample.

At the third stage, the sampling units are students, teachers/lecturers, and administrators (individual subjects). To give more or less equal representation, 5 to 8 students from each one of the High School, Junior Colleges, Industrial Training Institutes (ITIs), and 10 to 15 students from each of the Polytechnics are selected at random to have in total, 60 students in each district from each type of the institution. Similarly, the teachers/instructors/lecturers handling vocational subjects are selected at random from Industrial Training Institutions and Polytechnics, and all such vocational teachers and junior lecturers are included in the sample to make of 65 to 70 from each one of the three regions and the third sub-sample administrator is included with all heads of the institutions and departmental administrative staff working at the district, regional, and state levels. The detailed distribution of the sample is set out in the table-1.
<table>
<thead>
<tr>
<th>Sample Design</th>
<th>District</th>
<th>N</th>
<th>Institution</th>
<th>Students</th>
<th>Institution</th>
<th>Students</th>
<th>Institution</th>
<th>Students</th>
<th>Institution</th>
<th>Students</th>
<th>Institution</th>
<th>Students</th>
<th>Institution</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>High</td>
<td>60</td>
<td>Junior</td>
<td>8</td>
<td>Polytechnic</td>
<td>60</td>
<td>College</td>
<td>50</td>
<td>Institution</td>
<td>150</td>
<td>Institution</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Industrial</td>
<td>15</td>
<td>Training</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>School</td>
<td>8</td>
<td>Institute</td>
<td>15</td>
<td>Polytechnic</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>High</td>
<td>18</td>
<td>Junior</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>College</td>
<td>8</td>
<td>Institution</td>
<td>15</td>
<td>Institution</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>High</td>
<td>12</td>
<td>Junior</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>College</td>
<td>8</td>
<td>Institution</td>
<td>15</td>
<td>Institution</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Industrial</td>
<td>16</td>
<td>Training</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>School</td>
<td>8</td>
<td>Institute</td>
<td>15</td>
<td>Polytechnic</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>High</td>
<td>19</td>
<td>Junior</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>College</td>
<td>8</td>
<td>Institution</td>
<td>15</td>
<td>Institution</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Industrial</td>
<td>23</td>
<td>Training</td>
<td>8</td>
<td>Polytechnic</td>
<td>8</td>
<td>School</td>
<td>8</td>
<td>Institute</td>
<td>15</td>
<td>Polytechnic</td>
<td>50</td>
</tr>
</tbody>
</table>
Collection of the Data

The investigator personally visited all the institutes included in the sample. A good rapport has been developed with the head of the institution and permission obtained to administer the tools on him and the teachers/lecturers and students. The students have been made to sit in a separate room where no teacher would observe what they do. Then the self-explanatory instruments developed by the investigator have been administered on 58 students selected at random from each institution. The procedure of scaling has been explained with the help of an example to make them understand clearly what they should do. They have been provided with a copy of attitude scale and requested to respond to all the items in the tool. They have been asked to put a tick mark in one of the brackets against each item which suits their feelings. At the end of the tool to collect information about personal and demographic variables various items have been given and the subjects have been instructed to fill those items properly. Thus the data were collected from the students in a pleasant approach.

The teachers have been given the attitude scale and also personal data sheet to collect personal and demographic variables and requested to respond to all the items given in the instrument without leaving any single item.

The administrators were also requested to respond to all the items in the instrument without leaving any single question.

Thus the data have been collected from the students, teachers, and administrators in a congenial atmosphere amicably.
Scoring of the Responses

The Likert type of attitude scales have been scored on a five point scale by giving weights 5 4 3 2 and 1 in the case of positive items and 1 2 3 4 and 5 in the case of negative items to the 5 alternative responses. The grand total to each individual on the entire scale has been obtained by adding the weightages on all the statements.

The information provided by the respondents in the personal data sheet is also numerically coded to suit the computer analysis.

Analysis of Data

As the data collected through different statements in the tools from different subjects are basically qualitative in nature, item-wise analysis has been carried out to identify the specific deficiencies in different aspects of vocationalisation of education. Statistics such as frequencies, percentages and Chi-square have been employed to describe the situation prevailing in the vocational education programmes.

The total score obtained by all the subjects are computed. The data have been carefully analysed employing appropriate statistical techniques. Descriptive statistics such as mean, median, mode, quartile-deviation, standard deviation, skewness and kurtosis have been employed to describe the nature of the distribution of scores. Graphical representations are also made suitably. To test different hypotheses, the inferential statistical techniques such as 't' test and 'F' test have been employed. The numerical results thus obtained have been interpreted meaningfully.

The detailed analysis of the data and discussion on the results are presented in the succeeding chapter.