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CHAPTER 3
RESEARCH DESIGN

3.1 Introduction

A design is used to structure the research, to show how all the major parts of the research project - the sample measures, treatments and methods of assignment- work together to try to address the central research questions. The activity related to design in research is comparable to those of the architect in design and un-architect structure i.e. as the architect does in the designing before construction activity gets underway. The importance of planning a research can never be underestimated. Planning of the research work saves time, money and energy. Systematic planning of the whole research work is, hence, very essential.

Research design is the important step in the research methodology which comes after selection of problem and formulation of the hypothesis. It is a mapping strategy based on sampling technique. Here mainly the chapter includes introduction to sampling techniques, research method and strategy, tools and techniques for collection of evidences, analyzing the data and mainly selection of tool and its standardization. It is the work before carrying on the real process. It is the statement of object of inquiry and how satisfactory culmination to be effected. Here researcher chooses the components of the project and development of certain components of a design. The research components are selected keeping in view the objectives of the research. In the present chapter research design is discussed.

3.2 Population

In any research work, the purpose of the researcher is to find out such conclusion which can be applied universally. The characteristics of the
population are to show the marked variations from place to place, and from
time to time. Therefore, the researcher has to identify the population, in order to
cover the conclusion that is applicable to the population.
According to Patel (2011), population means,

"When statistical information or data is to be collected from any field
then a group covering of all units on which data is to be collected is
called a population"

According to Siddhu (1985)

"Population means an aggregate or the totality of the subject
regarding which inferences are to be made in a sampling study"

According to Walter R. Borg,

“A population is any group of individuals that have one or
more characteristics in common that are of the interest of
researcher”

In any research, the investigator has to think of the population to which the
results are to be applied. The population is a universal set of subjects to which
the results are to be applied. Here, The researcher had decided to perform the
experiment with students to study effectiveness of standard-9th students of
Gujarati medium of Rajkot City of Saurashtra Region of Gujarat State.
Therefore, all the students studying in standard-9th of secondary schools of
educational year 2014-15 considered as population of the present study.

3.3 Sampling

Sampling is the process of selecting units from a population. So that by
studying the sample we may fairly generalize our results back to the
population, from which they were chosen. According to Best and Kahn (1989),

"A sample is a small proportion of a population selected for
observation and analysis."
According to P.V. Young,

“A sample is a short form of the well-defined clear group”

According to Goode and Hatt,

“A Sample is a small representative of a big population”

There are various methods of sampling. Following are various methods of sampling:

(A) Probability Sampling Methods
(B) Non Probability Sampling Methods
(C) Other Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Method</th>
<th>Method</th>
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</thead>
<tbody>
<tr>
<td>a. Random Sampling</td>
<td>a. Incidental or Accidental</td>
<td>a. Paired Sampling</td>
</tr>
<tr>
<td>b. Stratified Random Sampling</td>
<td>b. Purposive Sampling</td>
<td>b. Double Sampling</td>
</tr>
<tr>
<td>c. Systematic Sampling</td>
<td>c. Quota Sampling</td>
<td>c. Sequential Sampling</td>
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<tr>
<td>d. Cluster Sampling</td>
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<td>d. Snow-ball Sampling</td>
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<td></td>
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<td>e. Multi-Stage Sampling</td>
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</table>

Methods of Sampling

Figure 3.1

While selecting a sample, following points would be kept in mind:

- Sample should be representative of the population
- Each member of the population should have the chance to be selected
- Sample should be selected without any bias.

As the present study was experimental one, the researcher had decided to select one school from the population. The researcher selected purposive sampling technique in the selection of school. One schools of Rajkot city were
purposefully selected for the present study: (1) Sinhar School for the experiment. The detail of the selected sample is shown in Table-3.1

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Schools</th>
<th>No. of Students as Sample of the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Experimental Group</td>
</tr>
<tr>
<td>1</td>
<td>Sinhar Madhyamik School</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

In Table 3.1 sample schools and number of students in the sample is presented. In the experiment 40+40 students were selected in experimental and control group.

**3.4 Selection of Research Method**

Selection of proper research method is needed after detailed study of aspects and components of the problem under the study. Various methods are used to study according to the field of study. In this study, the experimental research method was selected. According to Best (1997),

“Experimental is the classic method of science laboratory where elements manipulated and effects observed can be controlled. It is the most sophisticated exacting and powerful method for discovering and developing an organized body of knowledge”

The special situation is created to examine the effect of independent variable on the dependent variable in which effect of only independent variable on dependent variable can be found and care is taken that other variables never affect the dependent variable in experimental researches.
3.4.1 Experimental Design of the Present Study

Research design is the plan, structure and strategy of investigation conceived to obtain answers to research questions and control variance. Different methods of research such as Experimental method, Historical method, Case Study method and Survey method are used for research. In the present study, the researcher has used is Experimental Design.

According to Festinger, “The essence of an experiment may be described as observing the effect on a dependent variable of the manipulation of an independent variable.” In the words of Greewood, “An experiment is the proof of a hypothesis which seeks to look up two factors in a casual relationship through the study of contracting situations which have been controlled on all factors except the one of the interest the later being either the hypothetical case or the hypothetical effect.”

The experimental design or technique refers to the layout or set up, procedure and conditions under which the experiment itself is carried out or conducted in research one or more than one factor or variables are effective. So this variable should be collectively examined.

Any one experiment design should be selected out of many designs in experiment type researches. The researcher has to select an experiment design which is related to his study. For present study, the researcher has selected the complete experimental simple equivalent group pretest-posttest experiment design. The design which is used in this present study is shown in the figure 3.2.
3.4.2 Planning of Experiment

The real solution of any problem can be found by systematic planning of necessary activities, needed tools, time period etc for any systematic experimental research.
To collect the information for study, selection of thoughtful and systematic procedure is necessary. These data should be related to the subject, standard and reliability.

The planning from the beginning to the end is important to solve any research problem. It is beneficial to the researcher as stated below. Accurate direction can be obtained for the study. The probable problems during experiment administration can be predicted. The research work can be preceded speedily and with no difficulty. The wastage of money, time and energy can be avoided. The probable problems during administration of experiment can be avoided by finding out solutions.

For this study, the methodology and tools were to be thought out scientifically. If the plan is scientific, logical and proper for the selected problem, the result will be accurate and reliable. If the planning is not proper and systematic for any research problem, its solution will be indistinct, unjust, incomplete or incorrect. The planning for the experiment is proceeded as below.

3.4.2.1 Selection of the Standard

For the present, Students of standard-9th were selected for the experiment.

3.4.2.2 Selection of the School

The population for this study was the students of standard-9th having English subject in Gujarati medium schools in Rajkot City. So the researcher had to select those Gujarati medium schools from Rajkot City which had the facility of L.C.D. projector, Ground, and Common Hall which have facilities in terms of place, time, expense etc. to the researcher for his study. So, the
researcher selected an Urban school from Rakot City. From above school, Sihar Madhyamik School was from Urban area were selected purposively.

3.4.2.3 Process of Construction of the Pre tests

The researcher had decided to construct the Academic Achievement test (T1(i)), Social Skill Interaction (T1(ii)) as the pre test for experimental and controlled group. The process of the construction of these two pre tests is mentioned below.

3.4.2.4 Academic Achievement Test (T1(i))

The researcher decided to prepare the Academic Achievement test to examine the effect of Social Skill Development on Academic Achievement of students. The researcher prepared an objective test of 50 marks based on five topics of English subject of standard-9th. This test was considered as T1 (i) before the treatment of experiment as well as T2 (i) after completing the experiment.

This test was considered as T1 (i) before the treatment of experiment as well as T2 (i).

3.4.2.5 Social Interaction Ability Scale (T1(ii))

The researcher also decided to prepare the Social Interaction Ability Scale to examine the effect of Social Skill Development on Social Interaction Ability of students.

The self constructed Social Interaction Ability Scale was given to experts face to face or by post and courier for their suggestions and guidance.

On behalf of the opinions and suggestions by experts, some changes were made in Social Interaction Ability Scale. The researcher self
constructed the Social Interaction Ability Scale. The same Scale was indicated as T1 (ii) and T2 (ii).

3.5 Procedure of Construction of the Post tests

The researcher had intended to compare the obtained score of students included in experimental group and controlled group in Academic Achievement test (T2 (i)), and Social Interaction Ability (T2 (ii) The following post tests were constructed.

3.5.1 Academic Achievement Test (T2 (i))

The researcher decided to select the prior Academic Achievement pre test as the post test.

3.5.2 Social Interaction Ability Scale (T2(ii))

The Social Interaction measurement Scale was used as pre test (T1 (ii)). The same scale was used as a post test (T2 (ii)) in this study.

3.6 Planning of the Time table

The accurate time table was planned because the effect of Social Skill Development programme was to be examined for 24 days continuously after completing group forming process and pre tests procedure. The experiment was held accordingly. The details of time table is mentioned in annexure: D.

3.7 The Points in Mind Kept Before and After the Experiment

Necessary steps were taken to assure that the collected data was proper, accurate and reliable for the researcher. The information of such precautions is stated below.
3.7.1 Creation of Equal Groups

The research is a kind of experimental research. Two equal groups were formed out by the researcher. After formation of two groups, the following precautions were taken during the experiment was going on.

- During experiment, the treatment was given to the students of experimental group. The students of controlled group were kept far from the effect of Social Skill Development Programme and any other information related to experiment. This care was taken in both the groups for the Placebo effect could not take place on the students of controlled group. The researcher also kept the care that the students of experimental group could not realize that we are under the treatment of experiment to avoided the Hawthorne effect.

- The score of irregular students during the experiment were not taken into final data consideration. As a result, 6 students were not taken into final data consideration.

- The care for presence of the characters of both groups was taken. They had to participate in experiment from the beginning to the end.
3.7.2 Care during the Application of the Tests

The researcher had taken the following care during the application of all pre tests and post tests.

- It was supervised in Academic Achievement and Social Interaction Skill Scale pre test and post test that the students could not copy answer from others.
- Proper administration of each test was done according to the suggestions mentioned in tests.
- The scoring of students’ answers was done without any prejudice.

3.7.3 Social Skill Development Programme

The researcher had visited the sociologist and taken guidance from experts’ lectures of sociology colleges and also participated in social functions and activity before preparing programme indicated annexure- A. The programme had been implemented regularly step by step on students of experimental group for continuously for 24 days. Students were informed about some general rules before the beginning of experiment. The following care was taken in handling the programme.

- It was observed that the rules were followed by students before during and after programme.
- Regular presence of students of both the groups was insisted.
- It was also insisted that during programme self discipline and regularity in time were controlled by students.
- The researcher himself had administrated the programme in both the schools.
- It was also insisted that during programme self discipline and regularity in time were controlled by students.
3.7.4 Period of Transition

While carry out of the study with experimental method and after completing the experiment on the experimental group the interim period of transition should be passed. One day was passed as the period of transition before giving the post tests after completing the experiment. Then, the data was collected by giving post tests.

3.8 Tools of the Study

Proper tools for data collection make the study more qualitative and accurate. The details of tools used at various stages of experiment by the researcher are stated below.

The evaluation of students at various stages during experiment is necessary. For this purpose, score of pre tests and post tests of students are compared and statistical examining of significance of null hypotheses can be done.

The experiment was held in one school. Two equal groups were formed. Out of those two groups, one group was taken as controlled group and another was as experimental group. The pre tests $T_1$ (i) and $T_1$ (ii) were given to students of both the groups. The score of those two pre tests were collected. Then, the researcher had administrated the social skill programme on the experimental group for continuously 24 days. The detailed information of the programme is stated in the next chapter-4.

3.9 Collection of the Data

This research is an experimental research. To carry out the experiment, at first two equal groups were formed according to the nature of the complete experimental simple equal group pre test post test design. In this way, the data collection of first stage was completed. Proceeding according to this design, data of second stage was collected by scoring of pre tests $T_1$ (i) and $T_1$ (ii).
After completing the experiment and passed the transition period, post tests were given to both the groups, i.e. T2 (i) and T2 (ii). Thus, the data of third stage was collected by scoring of those post tests.

3.10 Analysis of the Data

According to the objectives and the hypotheses decided in chapter 1 of this study, the collected data in the form of score was classified and ‘t-test’ was used for statistical analysis.