CHAPTER XV
PLANNING AND PROCEDURE

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4.1 Introduction

A research design is the plan, structure and strategy of investigation conceived so as to tackle and encounter the research problem more efficiently and accurately. The plan is the overall scheme of the programme of research including an outline of everything the investigator will do from formulating of the hypotheses and their operational implications to the procedure of collecting data and then final analysis and interpretation of the data in details. The strategy is more specific and includes the experimental designs to be used to collect data and the tools to analyse and interpret the data.

Experimental design or technique refers to the layout, procedure and conditions under which the experiment itself is carried out or conducted. The use of refined, well-planned technique increases accuracy of the results of experiments by utilizing intelligently the principles of randomization, exercising sufficient control over experimental conditions and independent factors and subjective the data to adequate statistical analysis in order to separate out the contribution of experimental conditions.
Cockran and Cox have pointed out that the principal objectives of a good experimental technique are as follows:

1. To secure uniformity in the application of treatment,

ii. To exercise sufficient control over external influences so that every treatment produces its effects under comparable and desired conditions,

iii. To devise suitable unbiased measures of the effects of the treatments, and

iv. To prevent gross errors, from which no type of experimentations seems to be entirely free. ¹

4.2 Purpose of Research Design

Research designs are invented to enable researcher to answer research questions as validity, objectivity, accurately and economically and yet as efficiently as possible. Research designs have two basic purposes:

1. to provide adequate sufficient answers to research problems and to give maximum information with minimum expenditure of time, money and efforts, and

2. to control variance.

A research design is a set of instructions to the investigator to gather and analyse his data in certain ways, strictly in accordance with certain controlled procedures. It is, therefore, a control mechanism. Thus, by constructing an efficient research design, the investigator attempts:

1. to maximize the variance of the dependent variable,
2. to control the variance of extraneous or unwanted variables that may have an effect on his experimental outcome, but in which he is not interested and
3. to minimize the error or random variance, including so-called errors of measurement, error due to uncontrolled individual differences or due to chance error factors.2

The designs that satisfy these criteria are called good, efficient designs.

For the present study, the investigator had naturally to plan factorial designs to study the impacts of reading on achievement. In a factorial experiment the effects of

A number of different factors are investigated simultaneously, particularly with an aim to study not only the main effects of the factors involved but also interaction effects which are best studied with a factorial design. But the fundamental question before the investigator was the availability of a suitable tool to measure reading ability of the pupils without which the study could not proceed. Hence the investigator has decided to develop a tool to measure reading ability. Here the word 'reading' indicates silent reading comprehension, because reading without comprehension has no meaning, so wherever the word 'reading' is used, it is always reading with comprehension. 'Silent reading' has been taken because it is a group test, where the whole group has to read silently and has to comprehend.

Certain tests on reading are available, but there were number of reasons for the investigator to construct and standardize a new test. The reasons for a new test are as follows:

i. There was no test available in mother-tongue for standard VII to fulfil the requirements.

ii. The investigator had to find the impact on different school subjects, so it was to be prepared taking reading content into consideration.
iii. The investigator wanted to select the material of the writers mostly of the districts from where she had to draw sample.

Considering the importance of the present study in the acceleration of the process of research in the field of reading and knowing fully well that it is a multiphased study, the investigation needs meticulous case in its planning and execution. The problem which centres round the study of impact of reading on the achievement of different school subjects needs a careful selection of the material to measure the reading ability of the pupils.

4.3 Statement of the Problem

The problem of present study is "A study of the Impact of Reading on the Achievement of Pupils of Class VII in Different School Subjects".

For many obvious reasons the construction and standardization of the Silent Reading Comprehension test was a must, to study the impact of reading on achievement.

The word 'reading' has always been considered as reading comprehension in the present study because reading without comprehension or understanding has no sense. For measuring ability of reading comprehension, the Silent Reading Comprehension test is planned to be constructed in mother-tongue and standardized. The academic achievement
in the school subjects, taught through mother-tongue has been considered to study the impact of reading comprehension.

To find out the impact on the achievement and to use the new standardized test, it will administered on about 960 pupils of the three districts of Ahmedabad, Kheda and Baroda of Central Gujarat. The sample will be randomly selected. Pupils of both the sex and from both the areas of urban and rural will be taken. To study the impact of reading they will be divided into three levels of readers viz., good readers, normal readers and poor readers and into three levels of S.E.S. of parents viz., Upper S.E.S., Middle S.E.S. and Lower S.E.S. of parents.

In order to make the research work more exact and reliable it is essential on the part of the investigator to define certain important terms used in the wording of the problem.

4.4 Definition of main Terms

It is the most essential task on the part of the investigator to make precise, the connotation and the meaning to define certain important terms used in the wording of the problem.
4.4.1 The Study

According to "The Reader's Digest Great Encyclopaedic Dictionary" the word 'study' means "Devotion of time and thought to acquisition of information esp. from books, (freq. pl) pursuit of some branch of knowledge", careful examination or observation .. take pains to investigate or acquire knowledge of subjects or to assure desired result".

According to Dictionary of Education of McGraw-Hill Series in Education, study is, "(1) application of the mind to a problem or subject; (2) a branch of learning; (3) an investigation of a particular subject or the published findings of such an investigation".

According to Chambers Twentieth Century Dictionary, study is, "to apply the mind to in order to acquire knowledge or skill to scrutinise, to look contemplatively at".

All the meanings are somewhat near the meaning, in the sense used in the study. Here pursuit for the knowledge of impact has been taken into consideration in the study.

4.4.2 The Impact

According to dictionary the literal meaning of the word 'impact' is, "strong effect, influence, the impulse resulting from a new idea or theory".
In the present study the strong 'effect' or 'influence' of reading on achievement is to be considered. The soul of the whole study is put in this one word. As the investigator has to find out the impact of reading on the pupils in their achievement in different school subjects. Reading is useful, only if it has some stronger effect on the reader. It covers various aspects of effects. Sometimes effect means the child is affected from the words, from the construction of sentences, new words etc., but here it is much more than that, where the child has to cross all these superficial meanings and has to establish understanding with the writer's ideas. If the child is able to catch the viewpoint of writer, it leaves the impact upon him.

4.4.3 Reading

The heart of the reading process is meaning and the primary aim of reading instruction is to develop readers' understanding and reacting to what they read. An effective product such as the desire to read, is based on the understanding of the message given by the writer.

Comprehension is the vital goal above all the reading goals, there is a great deal of consensus about its importance. As Ruddell (1974:208) said, "No one denies that one ultimate aim of reading instruction is to produce
readers who comprehend what they read."

Without comprehension words are only a series of lifeless symbols. When a learner understands and interacts with written or printed language, however the language can summarize the knowledge of the world, fulfil many of his or her affective needs and can touch the very fibers of the child's existence. Comprehension is a primary goal of reading.

Reading is a vital term interpreted and used by different educationists and psychologists. Which is according to David Russel, "Perception + understanding + Judgement + Use which is shortly known as P + U + J + Use = Reading.

Here it is believed,

1. that reading is a thinking process,
2. that reading is one segment of the language arts,
3. that there is no one method by which all children learn to read, that every child has a right to be taught by the method best suited to his needs.

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4. that reading instruction should be planned, organised and sequential,

5. that reading is a developmental process that every child has right to his rate of development, and

6. that reading is a skill necessary to wholesome living; that every child has right to be taught to read to the best of his ability.

Reading is complex of many things, to reach to its depth comprehension is must, without understanding reading is nothing but beating the bush.

The test of reading comprehension is constructed in mother-tongue due to certain obvious reasons. Language is a means or a vehicle through which one can express one's thoughts, feelings and emotions. Their thoughts are generally expressed in mother-tongue by the pupils of about 12 years.

Imagine the position of a body with head, limbs and trunk, everything is there but it is dead till there is no soul. Mother-tongue is a soul of the language which gives life to it. Child's oral mother-tongue forms the basis for the development of reading and writing. At primary stage
our attention is generally focused on teaching pupils to express in simple language what they normally experience at home and at school.

So the major objective of the study is to develop a test of reading comprehension and to study the impact of reading on the achievement of pupils.

4.4.4 Achievement

The definition of the word 'achievement' according to dictionary of education is, "a test designed to measure a person's knowledge, skills, understanding etc., in a given field taught in the school, in practice, several types of subject matter and may yield separate scores for each subject, such a test is usually called an achievement battery.

According to Chamber dictionary achievement is "accomplishment or proficiency of performance in a given skill or body of knowledge".

Its another meaning according to same dictionary is "levels of individual's educational achievement as determined by comparing his scores in a test with the average scores of others of the same age." This definition indicates the exact meaning according to the requirements of the study.
For the present study the achievement of the children is limited to the results of the question-papers from the text-books of different school subjects, prescribed by the Board of Education of Gujarat State. The data of their achievement is collected from their respective schools - registers and the marks have been converted into 'T' scores.

4.4.5 The Pupils

In the study like the present one the word 'pupils' is used specifically. In standard VII pupils are generally familiar with writing of short stories with the help of given points, writing of letters to friends and relatives, describing familiar objects, places, festivals. The reflective essay has a relatively subordinate place in primary schools. According to Jean Piaget, "Genuine argument and collaboration in abstract thought constitute a stage of development which only intervene after the age of seven."  

The standard VII (12+) is selected because of psychological as well as administrative reasons.

The period of childhood is continuous till the age of 11 or 12. From the age of 12 boys and girls develop different tendencies and interests, show different aptitudes and also

pass through great emotional and temperamental changes. The age of the students of VII standard (12+) is a 'break' when child leaves childhood and enters adolescence, the next stage in his life. According to Nunn, "the age of 11 plus lies between two periods, childhood and puberty which have distinctive emotional and intellectual features". Therefore it is very clear that at the age of 11+ one chapter in the life of the child is over and he enters the second phase of life.

The administrative reasons for selecting the age of 12+ is as important as the psychological one. In Gujarat State most of the children leave the primary schools to go to secondary schools for prosecuting their studies further.

Moreover it is termined point in the Gujarat State where the child finishes his primary education and enters in the secondary school, where instead of objectivity of the material, comprehending power is to be used, so the pupils of seventh standard were selected.

The idea behind selecting districts of Central Gujarat is that it is difficult for one single handed to cover the whole State of Gujarat.

Urban and rural both the areas were selected though most of the reading material is the same as far as syllabus
is concerned, but there is difference in other reading material which is common among city children, and not very popular with rural areas. And there are words which can only be recognized by village children while there are certain words which can only be recognised by the city-bred children. It is hypothesised that it may naturally influence impact.

4.4.6 Different School Subjects

Here only those school subjects have been considered which are taught through Gujarati language. As the main aim of the investigator is to determine the impact of reading on academic achievement, only academic subjects viz., elementary mathematics, general science, social studies and Gujarati have been taken into account.

4.5 Objectives of the Study

The main objectives of the study are as follows:

1. To construct and standardize a Silent Reading Comprehension Test for the Pupils of Standard VII for using it as a tool for the present study.

2. To provide schools with a valid and reliable tool to measure Silent Reading Comprehension in Gujarati language at the secondary school entrance stage.
3. To establish norms of reading comprehension in Gujarati language for standard VII.

4. To testify the validity and reliability of the tool and administration of the standardized test.

5. To study the impact of reading on the achievement in different school subjects of the pupils.

6. To study the impact of reading ability with regard to the area differences.

7. To study whether S.E.S level of parents play any part in the academic achievement.

8. To study the relationship between various independent variables and product variable achievement.

9. To study correlation between reading ability and reading speed with achievement of pupils in different school subjects.

4.6 Hypotheses

The following hypotheses have been formulated keeping in view objectives no. 5 to 8.

Hypothesis 1

Pupils from rural area do not differ from pupils from urban area in their achievement in Gujarati.
Hypothesis 2

Pupils with good reading comprehension do not differ in Achievement of Gujarati from those with normal and poor reading comprehension.

Hypothesis 3

Boys do not differ from girls in their achievement in Gujarati.

Hypothesis 4

Pupils belonging to upper S.E.S. level of parents do not differ from the pupils of the middle and Lower S.E.S. Level of parents in their Achievement in Gujarati.

Hypothesis 5

Urban pupils do not differ from rural pupils in the academic achievement in Social Studies.

Hypothesis 6

Pupils with good reading comprehension do not differ in achievement from those with normal and poor reading comprehension in Social Studies.

Hypothesis 7

Boys do not differ from girls in academic achievement in Social Studies.
Hypothesis 8

Pupils belonging to upper S.E.S. Level of parents do not differ from the pupils of the middle and lower S.E.S. level of parents in the achievement of Social Studies.

Hypothesis 9

Urban pupils do not differ from rural pupils in the academic achievement in Science.

Hypothesis 10

Pupils with good reading comprehension do not differ in achievement from those with normal and poor reading Comprehension in Science.

Hypothesis 11

Boys do not differ from girls in academic achievement of Science.

Hypothesis 12

Pupils belonging to Upper S.E.S. level of parents do not differ from the pupils of the middle and lower S.E.S. level of parents in the achievement of Science.

Hypothesis 13

Pupils from rural area do not differ from pupils from urban area in their achievement in Mathematics.
Hypothesis 14

Pupils with good reading comprehension do not differ in achievement from those with normal and poor reading comprehension in Mathematics.

Hypothesis 15

Boys do not differ from girls in their achievement in Mathematics.

Hypothesis 16

Pupils belonging to Upper S.E.S. level of parents do not differ from the pupils of middle and Lower S.E.S. level of parents in their achievement in Mathematics.

4.7 Methodology

The main parts of the Research Design

Looking to the objectives and hypotheses, the design has been divided into two main parts, such as:

1. Development of a Silent Reading Comprehension Test in Gujarati for Standard VII, and

2. Studies on the Impact of Reading on the academic achievement.
4.7.1 Development of the Tool

Development of a Silent Reading Comprehension Test in Gujarati for Standard VII.

The scheme of the study has been presented mainly in three parts as follow:

1. Plan and Procedure of the test.
2. Construction of test-items and their experimental try outs.
3. Final run of the test, establishment of norms, reliability and validity studies.

The main points of discussion under the first part are:

i. components of reading comprehension,
ii. determination of weightage,
iii. selection of reading material,
iv. preparation of test items,
v. arrangement of test-items and sub-tests and
vi. description of sub-tests.

In second portion (i) number of items for try out, (ii) item-analysis, (iii) item-validity and (iv) selection of items will be discussed.
In third part (i) sampling (ii) administration of the final test (iii) scoring of the test (iv) establishment of norms and (v) standard scores will be stated.

Reliability and validity studies of the test will be presented in chapter V.

4.7.2 Studies on the impact of Reading on the Academic Achievement in different school subjects

For studies on the impact of reading on the academic achievement, the methodology and experimental design selected will be described hereafter.

4.7.2.1 Design for studying the impact of reading

E.F. Lindquist has summarized for the purpose of research in psychology and education, the basic experimental designs thus:

1. Treatment x Level Designs
2. Simple Randomized Designs
3. Treatment x Subjects Designs
4. Random Replication Designs
5. Factorial Designs

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Various types of experimental designs have been discovered in recent years for use by research workers during experimental operations, depending on the field of investigation as well as the problem and the purpose of the experiment. For the present study the investigator will be selected factorial design.

Factorial Design

In this design there are two or more cross-classifications of treatments, in which the effects and interactions of two or more experimental variables are simultaneously observed. "If we take all possible combinations of these variables with levels and incorporate each combination as a separate experimental condition, we have an arrangement known as a factorial design. In a factorial experiment, the effects of a number of different factors are investigated simultaneously, particularly with an aim to study not only the main effects which are best studied with a factorial design." 7

The selection of a specific experimental design for an experimental study depends upon the purpose as well as the problem of the study. Here for the studies of impact of

reading, this design was the most suitable design as two or three independent variables were working simultaneously.

The method adopted in this study is considered according to its demands. To testify the constructed and standardized tool developed, it will be administered to about 960 students of three districts of Ahmedabad, Kheda and Baroda. The results of these 960 pupils will be computed. The sample of pupils included will be sample of boys and girls from both the areas (urban and rural).

The S.E.S. level of their parents will be decided by the S.E.S. scale developed by Kuppuswami and Mehta (vide S.E.S. scales in Appendix E).

With the help of the results of the Silent Reading Comprehension test, all the 960 pupils will be divided into three categories of readers on the criteria of quartile deviation. As the total number of items are to be 120 and every item will be carrying one mark so the students who will get 85.57 or above marks will be considered good readers, pupils getting 56.38 or less marks will be considered poor readers and pupils who get from 56.39 to 85.56 marks will be put under the category of normal readers.

The annual examination results will be ascertained from the respective school-records for all the 960 pupils.
The data will be classified and presented in suitable tables to investigate into the impact of Silent Reading Comprehension on the academic achievement in different school subjects.

Two factorial designs will be prepared for purpose of the present study.

i. Sex x Area x Reading : 2x2x3 Factorial Design

ii. Reading x S.E.S. of Parents : 3x3 Factorial Design

The subjects like Gujarati language, Social Studies, Science and Mathematics, which are taught in mother-tongue (Gujarati) will be taken for studies of impact.

The relationship between reading comprehension and reading speed with achievement in several school subjects will be calculated. A correlation Matrix will be prepared. Where it can be concluded how far reading comprehension is related as one of the most important correlates of academic achievement.

Mean, $\bar{X}$, $\bar{X}^2$, standard error of means, co-efficient of variation and analysis of variance will be employed. The description, collection, tabulation and interpretation of the data will be presented in the chapter VI.
As shown in the chapter the study is divided into two main parts; the next chapter is devoted to the description of the first part: the Construction and Standardization of the Reading Comprehension Test.