CHAPTER- III

RESEARCH DESIGN AND METHODOLOGY

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CHAPTER – III
RESEARCH DESIGN AND METHODOLOGY

3.1 ORIGIN OF THE STUDY

The subject of Home Science is very important in today’s pretext that cater to the needs of the students. This subject has advantage over the other subjects in terms of vocation. Two alternatives are open before them. They can get the employment from outside sources or they can be self-employed. The investigator has been teaching the subject of Clothing and Textiles as part of Home science at under graduate and post graduate levels. In the duration of her teaching career it was found that students shy away from offering this subject as they are not introduced to this subject in the school and they do not have prior knowledge about the subject. Resulting, the students shy away from this subject. They do not take interest in this subject. They think that they will not be able to cope with it. Teaching by traditional method does not fulfill the need of the day. This method is time consuming. Learning the practicals in a limited time is not very easy. So to arouse the interest of the students in the subject the investigator decided to develop this multi media package in the form of power point and video presentation for two units of Home Science.

Importance of research design: - When any type of research is undertaken first of all the type of research is selected. There are many types of researches. The type of research selected depends upon the unit selected and its contents.

McMillan, J. H. (1996) has given the following types of researches along with their purposes

<table>
<thead>
<tr>
<th>Type</th>
<th>Purpose</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative</td>
<td>To provide rich narrative descriptions with words of phenomena that enhance understanding</td>
<td>Observations of school renewal teams to understand the role of parents.</td>
</tr>
<tr>
<td>Quantitative</td>
<td>To describe phenomena</td>
<td>The relationship between amount</td>
</tr>
<tr>
<td>Research Model of Experimental Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Basic Principles of Experimental Design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professor Fisher has enumerated three principles of experimental designs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(1) The Principle of Replication  (2) The Principle of Randomization  (3) The principle of Local Control.

According to the Principle of Replication, the experiment should be repeated more than once. Thus, each treatment is applied in many experimental units instead of one. By doing so the statistical accuracy of the experiments is increased. However, it should be remembered that replication is introduced in order to increase the precision of a study; to say, to increase the accuracy with which the main effects and interactions can be estimated.

The Principle of Randomization provides protection, when we conduct an experiment, against the effects of extraneous factors by randomization.

The Principle of Local Control shows the extraneous factor, the known source of variability, is made to vary deliberately over as wide a range as necessary and this needs to be done in such a way that the variability it causes can be measured and hence eliminated from the experimental error. (Kothari, C.R.- Research Methodology)

Kothari has given important experimental designs. According to him Experimental design refers to the framework or structure of an experiment. They can be classified into two broad categories ie (i) informal experimental design. (ii) formal experimental design. Informal experimental designs are those designs that normally use a less sophisticated form of analysis based on differences in magnitudes, whereas formal experimental designs offer relatively more control and use precise statistical procedures for analysis-

(i) Informal Experimental designs:-
   (a) Before and after without control design.  
   (b) After only with control design. 
   (c) Before and after with control design 

(ii) Formal Experimental Designs:-
   (a) Completely randomized design (C.R. design) 

   (b) Randomized block design (R.B. design)
3.2 Research Design

The investigator decided to use informal experimental design- After Only with control design. So the present study is developmental-cum experimental in nature. The study is divided into two parts. The first part consisted of development of self-instructional package in the form of computer multi-media presentation in power point on selected two units of Home Science covered under the subject Textiles and Clothing for F.Y.B.A. college students. These units are:

1. Basic techniques of Clothing Construction.
2. Principles of design.

The second part of the study is concerned with the experimental try-out of the developed self-instructional package. Since the study is experimental The researcher has selected the ‘experimental approach’ for evaluating the effectiveness of the developed package. The researcher also wanted to compare the two methods that is teaching by traditional method and by using the self-instructional package approach. So, there was one controlled group, one experimental group and two replication groups. The groups were allotted by using lottery system. In all four groups were formulated. The traditional method of teaching was applied to control group of H.R.Shah Mahila Arts and Commerce College, Navsari. For the experimental group, Sh. Rang navchetan Mahila Arts College, Valia was selected and for the replication groups Z.F. Wadia Women’s College, Surat and Smt. J.P. Shroff Arts College, Valsad were selected.

To know the effectiveness of the treatment Post test was administered and effectiveness of treatment was evaluated. Thus, the research design for present study is:-

(c) Latin Square design (L.S. design)

(d) Factorial design
Randomized Post test comparison Group design with Replications.

T O
R : ------------------- with Replication I & II
C O

For conducting this experiment all the four Arts colleges of Veer Narmad South Gujarat University, Surat teaching Home Science subject were selected. The students of Control group were taught by demonstration and lecture method within the limited time. In experimental group self-instructional packages were used. The same self-instructional packages were given to two replication groups belong to Z.F. Wadia Women’s College, Surat and Smt. J.P. Shroff Arts College, Valsad. After the experiment all the four groups were given post test. After treatment to experimental and replication groups opinionnaire were given to know their opinion about the self instructional package.

Table 3.1
Design of the Experiment

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Type of group</th>
<th>Treatment</th>
<th>Post-test phase</th>
<th>Opinionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>Traditional method</td>
<td>Achievement scores on the criterion test on package 1&amp; 2</td>
<td>Students responses on opinionnaire</td>
</tr>
<tr>
<td>2</td>
<td>Experimental</td>
<td>Self-instructional package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Replication- I</td>
<td>Self-instructional package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Replication- II</td>
<td>Self-instructional package</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Variables of the Study:

- Experimental group
- Replication group-I
- Replication group-II
- Controlled group

- Use of self-instructional method
  - Questionnaire
  - Opinionnaire

- Use of self-instructional method
  - Questionnaire
  - Opinionnaire

- Use of self-instructional method
  - Questionnaire
  - Opinionnaire

- Teaching by traditional method
  - Questionnaire
  - Opinionnaire
<table>
<thead>
<tr>
<th>S. no.</th>
<th>Variable</th>
<th>Type of variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Independent variable</td>
<td>Teaching method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Traditional method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Teaching through self-instructional package I &amp; II</td>
</tr>
<tr>
<td>2</td>
<td>Dependent variable</td>
<td>-Post test Scores on achievement test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Opinions of the experts &amp; students</td>
</tr>
<tr>
<td>3</td>
<td>Controlled variable</td>
<td>-Class – F.Y.B.A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Subject- Home Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit-1 Basic Techniques of Clothing Construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit-2 Principles of Design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Sex</td>
</tr>
</tbody>
</table>

### 3.2 POPULATION AND SAMPLE OF THE STUDY

The population for this study consisted of all the F.Y.B.A. Home Science students belong to four Arts colleges affiliated to Veer Narmad South Gujarat University, Surat. Since the numbers of students in this principal subject of Home Science are less, therefore the whole population is selected as sample. Researcher tried to collect data from all F.Y.B.A. students belong to following four colleges. Details are as below:
### Table-3.2

**Sample of the Study**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the College</th>
<th>Class</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H.R.Shah Mahila Arts and Commerce College, Navsari</td>
<td>F.Y.B.A.</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Z.F Wadia Women’s College, Surat</td>
<td>F.Y.B.A.</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Smt. J.P. Shroff Arts College, Valsad</td>
<td>F.Y.B.A.</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Sh. Rang Navchetan Mahila Arts College, Valia</td>
<td>F.Y.B.A.</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

On random selection, H.R.Shah Mahila Arts and Commerce College, Navsari was selected as a control group while other college Sh. Rangnavchetan Mahila Arts College, Valia as an experimental group, Z.F. Wadia Women’s College, Surat as Replication group-I and Smt. J.P. Shroff Arts College as Replication Group-II. Experimental and replication groups were given treatment of self-instructional packages.

Before proceeding to experiment, a pilot study was undertaken to know the validity, suitability and drawbacks of the evolved self instructional package. After analyzing the data it was found that the students obtained about 75% of marks which suggested that the package developed was understood by the students clearly. However there were some drawbacks. The investigator took those into consideration and made the necessary changes in the package.
3.4 RESEARCH TOOLS

To conduct the experiments for the research the investigator prepared following tools for research for the selected units.
1. Self Instructional Package –I (Basic techniques of Clothing Construction) consisted of
   PPT with video clips.
2. Self Instructional package-II (Principles of design.) consisted of PPT.
3. Criterion Test (used as post test)
4. Evaluation Sheet for experts
5. Opinionnaire for Students

Detailed information related to the development of research tools is discussed in detail in the next chapter.

3.5 STATISTICAL TECHNIQUES USED FOR ANALYSIS

To find the academic achievement score of Post test for four groups in terms of levels percentage is used. To compare between the mean scores of experimental group and its replication with the control group “t” test was used and the data was analyzed by using SPSS package on computer.

3.6 DELIMITATIONS OF THE STUDY

1. Only four colleges of Veer Narmad South Gujarat University, Surat were selected. Therefore, the population is the sample in this study.
2. The experiment was conducted only on Gujarati medium students of the four colleges.
3. Only two units were selected for developing self-instructional package.
   1. Self-instructional package-1 was prepared using power point and video instructions
   2. Self-instructional package-2 was prepared using power point slides.

The next chapter deals with the development of self-instructional package and other research tools in detail.