Chapter – 3
Methodology of Research

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3.1 Introduction

“Planning is a minute map of the schemes of the actions to be done in future.”

Planning helps to reach to be success in any action. To achieve any aim it is necessary to have made a careful and faultless planning which leads the actions in the right direction. Planning realizes the motto “Less investment and real gain.” Planning helps the researcher to think in advance about the requisite tools, and people to overcome the hurdles in the research process. It prevents the wastage of time, energy and money and makes the research work simple and speedy. It gives a definite direction to the research process. Kishor Shah (2003) has rightly said,

“Planning is a real phenomenon. In addition, the hypothetical thoughts emerge from experience. The planned and foresighted actions become fruitful and it cannot be vanished and can be implemented easily.”

3.2 Emergence of the Problem

Day by day new approaches are conducted so as to impart free and compulsory education to the children in the age range of 6 to 14 years. Sarvashiksha Abhiyan has the aim to cater knowledge to the primary school children in such a way that the education is without any load, pleasant, child centered, competency centered and on the principle of ‘play while learn’. Long lasting and senses oriented knowledge is imparted to the children through interesting and advanced techniques so that the quality of education can be increased. The researcher has been teaching in primary school since 2002 and so is well aware that the children of primary school love to learn through different techniques and methods. The main aim of the present research was to investigate the difference, if any, in the achievement of the children as a result of teaching through puppet method and picture-story method. The researcher also wanted to know that out of the two methods i.e. puppet method and pictorial story method, which method effects more on academic achievement.

3.3 Population

According to D. A. Uchat (2004),
“The whole group from which a representative sample is taken for the purpose of obtaining data and for which findings are drawn is called population.”

The present research was a comparative research about the effect of teaching methods on the academic achievement of the students so the population has been defined as follows.

The present research was about the effect of teaching methods on the academic achievement of the students of standard 6th so; the population of the research was the students of std. 6th studying in the year 2013-14 in the Gujarati medium primary schools.

Thus, the population of the present research was all students of std. 6th studying in the year 2013-14 in the Gujarati medium primary schools.

Thus, the findings of the research were generalized for the population having following characteristics.

Area: Gujarat
Educational Level: Standard 6th
Medium: Gujarati
Subject: Social Science
Unit: Our courts

3.4 Sample Selection and Sample

According to Internal Dictionary of Education (1970),

“Sample is a group use which is selected from a larger group of population for the purpose of examination.”

Thus, sample selection is a process of selecting a representative portion from population so as to infer generalization. Sample is selected in accordance with the objectives of the research. The techniques of sample selection are as follows.
In the present research, random sampling technique of the probable sampling type was selected. The rural and urban schools of Gujarati medium of Palanpur taluka were selected. From the selected schools, sample was selected via random sampling technique.

As the researcher has studied and been serving in Banaskantha district, the Palanpur taluka was selected by purposively to implement experiment. A class of standard 6th of each school of Bhagal (Jagana) primary school of rural area and Branch school no.1 of urban area was selected out of 182 schools of Palanpur taluka by cheat method of randomized sampling technique. A cluster of students of each class was selected.

The sample of 140 students was selected by multiple sampling techniques. The detailed information of the sample of both the teaching methods i.e. puppet method and pictorial story method is given in the table 3.1
Table 3.1

Groups and Subjects of the Sample
Indicate the groups in the following table

<table>
<thead>
<tr>
<th>Gender</th>
<th>Puppet Method</th>
<th>Pictorial story Method</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Boys</td>
<td>18</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Girls</td>
<td>17</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 3.1 shows that two groups for puppet method and two groups for pictorial story method from schools of ruler and urban area respectively were framed. 35 students were selected for puppet method for rural area school out of it 18 boys and 17 girls. Same way, 35 students were selected for puppet method from urban area school from which boys were 19 and girls were 16. 35 students were selected for Pictorial story Method from rural area school from which boys were 21 and girls were 14. In the same way, 35 students were selected for Pictorial story method from urban area school out of it 20 boys and 15 girls. This way the clusters of students were selected randomly.

All the groups were experimental in the present research. The sample of 140 students was selected by multiple sampling techniques.

3.5 Research Method

According to D. A. Uchat (2004),

“Research method is the essential part of the research process. After the careful explanation of the research problem, the researcher performs specific tasks for data collection in accordance with the objectives of the research which is known as research method.”

In the present research, not only the effect of the independent variable on the dependent variable was to be investigated but also the effect of the teaching methods on the academic achievement was to be compared. So, experimental research method was selected in the present research.
### 3.5.1 Experiment Design

The three types of experimental design used in education research. Different experiment designs are classified into sub-design which is as under.

<table>
<thead>
<tr>
<th>Experimental Designs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type - 1</strong> Pre-experimental Design</td>
</tr>
<tr>
<td>1. One-shot Case Study</td>
</tr>
<tr>
<td>2. One-Group, Pretest-Posttest Design</td>
</tr>
<tr>
<td>3. Static-Group Comparison Design</td>
</tr>
<tr>
<td><strong>Type - 2</strong> True Experimental Design</td>
</tr>
<tr>
<td>1. Posttest only, Equivalent Groups Design</td>
</tr>
<tr>
<td>2. Pretest-posttest Equivalent Groups Design</td>
</tr>
<tr>
<td>3. Pretest-posttest, Randomized Groups</td>
</tr>
<tr>
<td>4. Solomon Four Group Design</td>
</tr>
<tr>
<td>5. Factorial Design</td>
</tr>
<tr>
<td><strong>Type - 3</strong> Quasi exp. Design</td>
</tr>
<tr>
<td>1. Pretest-posttest Non-Equivalent Groups Design</td>
</tr>
<tr>
<td>2. Equivalent time-Design</td>
</tr>
<tr>
<td>3. Samples Design Time-Series Design</td>
</tr>
<tr>
<td>A. One Group Time-Series Design</td>
</tr>
<tr>
<td>B. Controlled Group Time Series Design</td>
</tr>
</tbody>
</table>

In the present research, Two groups were framed to teach through methods i.e. puppet method and pictorial story method and only post taste was administrated. The form of research designing would be Post test only, Equivalent Groups Design.
Thus, the post test only equivalent group design of true experimental design was used in this research.

### 3.5.2 Research design of the present research

Two main groups and four sub group were framed as discussed above experimental design. These four sub-groups were made equivalent on the bases of the annual results of std. V. One group each of the rural and urban area school was given treatment through puppet method. In the same way, the other was given the treatment through the pictorial story method. The teacher made achievement test was administrated to all the subjects to measure the dependent variable after the treatment.

#### Detailed Presentation:

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Independent Variable (Treatment)</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>-</td>
<td>X</td>
<td>T₂</td>
</tr>
<tr>
<td>E₁</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E₂</td>
<td>-</td>
<td>X</td>
<td>T₂</td>
</tr>
</tbody>
</table>

E = Experimental Group  
X = Treatment  
T₂ = Posttest (Teacher made achievement test)

Here, pretest was not used so there was no question of any effect on its result. The effect of treatment was investigated on the bases of the difference in the scores of post test. (T₂E₁ - T₂E₂) and comparative research of the treatment was carried out and the effectiveness of the puppet method and the pictorial story method was found out. This way comparative research of the tow methods was carried out by post test only equivalent group design of true experiment design of educational research.
3.5.3  Characteristics of the Experimental Design

The main three characteristics of the experimental design of the present research are as follows.

3.5.3.1  Controlling the Variables

To make sure the effect of only independent variable on the dependent variable some of the following variables were controlled. The controlled variables were as follows.

- **Standard**

  The experimental groups were framed from std. 6th so standard was as a controlled variable.

- **Subject**

  The subject selected for this experiment was Social Science, so subject was consider as controlled variable for each experimental group.

- **Content**

  The content of experiment for all four experimental groups was unit “Our courts”. Thus, content of teaching was also the controlled variable.

- **Medium**

  Present research was under taken only on the Gujarati medium schools. Thus, medium was taken as controlled variables.

3.5.3.2  Implementation of the Independent Variable

In the present research, teaching method was the independent variable. There were two levels of teaching methods and they were implemented on the dependent variable.
3.5.3.3 Observation of the Dependent Variable

The dependent variable is measured to investigate the effect of the independent variable after its implementation.

3.6 Validity of the Experimental Design

The validity of the experimental design is tested by two ways.

1. Internal Validity
2. External Validity

3.6.1 Internal Validity

In the present research, the internal validity was tested on the bases of the following factors.

a) Maturity

During the experiment, the physical and mental changes of the subjects make effect on the dependent variable. In the present research all the groups were taken as experimental group so the effect of the maturity on both groups would be equal.
b) Regression in the Subjects

The regression in the subjects has effect on the independent variable. In the present research no regression of subjects was found.

c) Tool of Measurement

If the tool of measurement or the person collecting data is changed, it may have effect on the independent variable. In the present research, teacher made achievement test was used as tool which was not changed during experiment. Further, during the whole process of data collection researcher himself collected the data.

Thus, internal validity was found satisfied in this experiment research.

3.6.2 External Validity

The external validity of the experiment was tested on the bases of the following factors.

a) Hindrance in experimental method
The subjects included in the experiment were given treatment only once. So, there is no question of the effect of one treatment on the other treatment.

b) Careful Description of the Experimental Treatment
The puppet programme and the pictorial story programme was described carefully so that other researchers or teachers can use the methods properly. Thus, through the careful description of the experimental treatment, control was established.

c) Interaction between the selection of the subjects and the independent variable
To control interaction between the selection of the subjects and the independent variable the representative sample of the population was selected randomly.

d) Interaction of experimental method
During the experiment period of 11 days, only one type of experiment was administered on one group. In this process, the rural and urban groups were given treatment through the puppet method. In the same way
the rural and urban area groups were also given treatment through the pictorial story method. Thus the reciprocal interactions of the experiments were controlled.

e) **Effect of the Researcher**
   To control Effect of the researcher piloting of the experiment programme was carried out. The suggestions received at the end of the piloting were implemented and necessary changes were made in the programme. In addition to this, before the implementation of the experiment treatment, instructions, current situation, presentations, etc were clarified in advance.

f) **Measurement of the Dependent Variable**
   Objective type test was constructed to keep consistency in the measurement of the dependent variable. The measurement of the dependent variable was controlled this way.

g) **Interaction between History and Independent Variable**
   To control Interaction between History and Independent Variable groups were framed according to two main independent variables. In the research, the duration of the experiment was of 11 days in each group. Thus, the interaction between History and independent variable was controlled.

h) **Interaction between the time of measurement and independent variable**
   The teacher made academic achievement test was administered to the all the four groups at the end of the programme. The dependent variable was measured by giving the teacher after the completion of the experiment. Thus the effect of the interaction between the time of measurement and the independent variable was controlled.

   Thus, satisfactory external validity areas found.

3.7 **Construction of the Programmes**

   Plays were constructed on the unit ‘Our courts’ of the subject Social Science of std. 6th for teaching the students of experimental group through the puppet method and the pictorial story method.
Before constructing the play, deep understanding regarding the script writing and construction of play was received. Then the unit ‘Our courts’ of the subject Social Science of std. 6\textsuperscript{th} was studied intensively. Primary forms of the plays on the unit were drafted. The piloting of the plays was carried out. The final draft of the play was prepared on the bases of the suggestions received at the end of the piloting through the experts.

After preparing the final draft of the play, puppets were received suitable to the characters included in the plays. Dialogues were also framed for each puppet character and they were used in puppet method.

The same plays were used to teach through pictorial story method. Pictorial stories were coordinated based on various scenes of the plays. Various pictures were prepared according to the scenes and they were painted by the researcher. These pictures were used to teach through the pictorial story method.

The detailed explanation of the construction of the programme is discussed in chapter – 4

3.8. Construction of the Tool

The effectiveness of the puppet method and the pictorial story method was assessed with the help of academic achievement test constructed by the researcher on the unit ‘Our courts’ of Social Science subject of std. 6\textsuperscript{th}. The scoring key of it an also prepared to assess the responses on it. The details of construction of the test and its key are as follow.

3.8.1 Construction of test

The academic achievement test was constructed by the following steps.

a) Content Analysis

The unit ‘Our courts’ was studied deeply and the entire programme based on that unit was also studied intensively at the beginning of the construction of the test. After the deep study of the content of the
programme, the content for the test was analyzed to frame questions of the test according to the objectives of the research.

b) Related Literature

The researcher studied various achievement tests of different units of the subject social science of std. 6th to decide the form of the questions.

c) Blue print of the Achievement Test

With the study of related literature, it was decided to construct objective type of test to keep consistence in the assessment. Wightage of marks of different types of objective type of questions was decided. Blue print was prepared and achievement test was constructed. The detailed blue print is shown in table 3.2

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of Question</th>
<th>Number</th>
<th>Wightage of question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Answer in One Sentence</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>2.</td>
<td>Fill in the Blanks</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>3.</td>
<td>Match Pairs</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>4.</td>
<td>Fill in the Blanks Choosing Proper Option</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

The written form of blue print is attached in appendix no.1.

d) First Draft of test

The achievement test was constructed according to the blue print as shown the table 3.2 which include answer in one sentence, fill in the blanks, match pairs and fill in the blanks choosing proper option type of questions. All questions were of objective type and weight age of each question was equal.
e) Opinions of the Experts

The first draft of the achievement test was sent to various experts for their suggestions. The details of the opinions of the experts with that names and action taken according to its suggestions are show in table 3.3

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Expert</th>
<th>Suggestions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. B.S.Patel</td>
<td>The options must be attractive</td>
<td>Accepted</td>
</tr>
<tr>
<td>2</td>
<td>Dr. S.P.Sharma</td>
<td>Time limit should be in accordance with the weight age.</td>
<td>Necessary changes are made.</td>
</tr>
<tr>
<td>3</td>
<td>Dr. S.R Joshi</td>
<td>Question should be very short</td>
<td>Accepted</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Gajendra Joshi</td>
<td>Understanding based questions should be included.</td>
<td>Accepted</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Pinalben Goradiya</td>
<td>Questions should be very short having answer in one or two words.</td>
<td>Accepted</td>
</tr>
<tr>
<td>6</td>
<td>Dr. C.P.Swami</td>
<td>Question should be asking clear and definite answer.</td>
<td>Necessary change is made.</td>
</tr>
</tbody>
</table>

f) Piloting

The first draft of the test with the necessary changes suggested by the experts was prepared and administered on the 15 students of std. 6th of Mervada Primary School of Palanpur taluka. It was found that the time limit set for the test was proper. After discussion with the guide regarding the questions included, weightage and time limit, 30 minutes time limit was set for the test of 20 marks.

g) Preparing Final Draft

Final draft of the test was prepared based on the suggestions received through the piloting and from the experts. Once again the format of questions and its language was checked. The time limit and weightage of the test was also decided. The final form of academic achievement test
and its scoring key were constructed. The written form of academic achievement test and its scoring key are attached in appendix no.2 and 3.

3.8.2 Scoring of the Responses

Academic achievement test was constructed on the based of the programme on the unit ‘Our courts’ of the subject Social Science of std. 6th had four types of questions of objective type. Scoring was done as follows.

Question Type- 1 There were 05 questions with instruction ‘Answer in one sentence’. For each correct answer (response) 01 mark would be scored.

Question Type – 2 There were 05 questions with instruction ‘Fill in the blanks’. For each correct answer (response) 01 mark would be scored.

Question Type – 3 There were 05 questions with instruction ‘Match Pairs.’ Three were two sections ‘A’ and ‘B’. The items in ‘A’ were to be matched with their correct corresponding answer from part ‘B’. For each correct answer (response) 01 mark would be scored.

Question Type – 4 There were 05 questions with instruction ‘Choose proper option’. For each question three options were given. For each correct answer (response) 01 mark would be scored.

Thus, the academic achievement test the ranged of scored from 0 to 20. (minimum 0 and maximum 20).

3.9 Schedule of Experiment

Period vise schedule was made to teach through puppet method and pictorial story methods to the two experimental groups from rural area and two experimental groups from urban area respective for the presentation of the programme as per the date and time allotted by the principals of respective schools in advance. Detailed explanation of the programme is given here.
3.9.1 Schedule for Group 1 of Urban Area

Period wise planning was made to teach the students of urban area through the puppet method is presented in the following table 3.4

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Period</th>
<th>Scene of the Play</th>
<th>Title of the play</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>01/07/2013</td>
<td>1</td>
<td>Scene:1</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Scene:2</td>
<td>Gangabanu Khetar</td>
</tr>
</tbody>
</table>
3.9.2 Schedule for Group2 of Urban Area

Period wise planning was made to teach the students of urban area through the Pictorial story method. It is presented in the table no 3.5

Table no. 3.5
Schedule for Group2 of Urban Area

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Period</th>
<th>Scene of the Play</th>
<th>Title of the play</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>01/07/2013</td>
<td>3</td>
<td>Scene:1</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Scene:2</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td>2.</td>
<td>02/07/2013</td>
<td>3</td>
<td>Scene:3</td>
<td>Gangabanu Khetar</td>
</tr>
</tbody>
</table>
### Schedule for Group 1 of Rural Area

Period wise planning was made to teaching the students of rural area through the puppet method. Presented in the table no 3.6

#### Table no. 3.6

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Period</th>
<th>Scene of the Play</th>
<th>Title of the Play</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>17/07/2013</td>
<td>5</td>
<td>Scene:1</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Scene:2</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td>2.</td>
<td>18/07/2013</td>
<td>5</td>
<td>Scene:3</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>Scene:4</td>
<td>Gangabanu Khetar</td>
</tr>
</tbody>
</table>
3.9.4 Schedule for Group2 of Rural Area

Period vise planning was made to teaching the students of rural area through the Pictorial story method. It is presented in the table no 3.7

Table no. 3.7
Schedule for Group2 of Rural Area

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Period</th>
<th>Scene of the Play</th>
<th>Title of the Play</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>17/07/2013</td>
<td>7</td>
<td>Scene:1</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Scene:2</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td>2.</td>
<td>18/07/2013</td>
<td>7</td>
<td>Scene:3</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Scene:4</td>
<td>Gangabanu Khetar</td>
</tr>
<tr>
<td>3.</td>
<td>19/07/2013</td>
<td>7</td>
<td>Scene:5</td>
<td>Gangabanu Khetar</td>
</tr>
</tbody>
</table>

achievement

Test

3.9

.4

Schedule

for

Group2

of

Rural

Area
### Data Collection

The data for this research was collected through the two phases

a) Implementation of experiment

b) Administration of tool

#### Implementation of Experiment

The selected student from schools from ruler as well as urban as discussed in 3.4 were divided into two groups on the bases of their results of annual exam of std V. By using cheat drawing method a group was selected to implement the program recording one group for puppet program and one group for pictorial story program was selected from each school.

Thus, 70 students were given the treatment through puppet method and 70 students were given the treatment through pictorial story method. Necessary
instructions and guidance were given before the implementation of the experiment.

The experiment was carried out from 01/07/2013 to 29/07/2013 for 01 hour per day (Two Periods) as discussed in 3.9. An academic achievement test was administered on all the experimental groups on the last day. i.e. on 16/07/2013 at urban area and on 29/7/2013 at rural area. This way the duration of implementation of experiment was for 20 days. The snaps of the implement of programme are here below.

The pictures of the experiment carried out through the puppet method and pictorial story method
3.10.2 Administration of Tool

After the implementation of experiment for 20 days, academic achievement test constructed as discussed in 3.8.1 was administered on each experimental group. To administrate the test, sitting arrangement of the students and necessary facilities were arranged. Proper rapport was established with the students and necessary instructions were given to the students. Then the test was given to each student. After the completion of time, the answer-sheets were collected and the students were thanked for their support in the research work.

This way the data was collected into two phases.

3.11 Analysis and Interpretation of Data

Analysis and interpretation of the collected data plays vital role in any research. The collected must be sorted out and presented in proper order.

The treatment through puppet method and pictorial story method respectively were given to the sample and data was collected as discussed in 3.10. As comparative study of both the methods was to be carried out with reference to moderate variables like area and gender, collected data was classified according to variables. The significant effect of the interaction of method, area and gender was investigated through analysis of variance technique to statistical technique. The details are disused in chapter V.

3.12 Conclusions

This chapter discussed the Emergence of the Problem, Population, Sample Selection and Sample, Research Method, Validity of the Experimental Design, Construction of the Programmes, Construction of the Tool, Schedule of Experiment, Data Collection, Analysis and Interpretation of Data.