CHAPTER III

METHODOLOGY OF THE RESEARCH

3.1. INTRODUCTION

This Chapter contains the rationale for the selection and detailed description of the design. It includes the elaboration of following major points.

1. Method of the Study.
2. Experimental design.
3. Selection of independent and dependent Variables.
4. Tools used for measurement and statistical techniques.
5. Procedure of the experiment.

Methodological Overview of the present study

Research can be classified into two Categories:

1) Qualitative Research
2) Quantitative Research

The present research is basically quantitative research where the data collected is analyzed in terms of numbers. Marks obtained in the post test decided the effectiveness of the CAI programme developed by the researcher. However certain qualitative aspects such as observations and reactions of teachers were also taken into consideration.

3.2 TYPES OF RESEARCH BASED ON METHODOLOGY -

There are three main types of researches:-

1) Historical Research
2) Descriptive Research
3) Experimental Research
Experimental Research describes what will happen when certain variables are carefully manipulated. The focus is on variable relationship. Deliberate manipulation is a part of experimental method. The immediate purpose of experimentation is to predict events in the experimental settings.

### 3.2.1 Phases of Research:

1. Review of Related literature.
2. Formulating research design.
3. Preparation of CAI programme on selected units.
4. Pilot Study.
5. Preparation of tests.
6. Selection of sample.
7. Administration of Content Test.
8. Administration of Intelligence Test.
10. Implementation of CAI programme.
11. Administration of Post Test.
12. Analysis of data.

The present study falls into the Category of Experimental research.

### 3.3 Experimental Design:

For a researcher, an experimental design is just like what a blue print is to an architect. There are various types of experimental designs. The selection of a research design depends upon factors such as nature and purpose of experiment, types of variables to be manipulated, nature of data, the facilities or the conditions for carrying out an experiment and the competence of the experimenter.
There are number of combinations of the various experimental procedures:

*Types of Experimental Design.*

- Pre Experimental Design.
- True Experimental Design.
- Factorial Design.
- Quasi Experimental Design.
- Time Series Design.

3.3.1 **Factorial Design:**

“When more than one independent variable is included in a study whether a true experiment or a quasi experiment a factorial design is necessary,” (Best & Kahn, 1991, p. 159)

“A Factorial design then, may be defined as a design in which the selected values of two or more independent variables are manipulated in all possible combinations so that their independent as well as interactive effect upon the dependent variable may be studied” (A. K. Singh, 1997, P. 394)

3.3.2. **Characteristics of Factorial design**

1. “Two or more independent variables are manipulated in all possible combinations.”
2. “The factorial design enables the experimenter to study the independent effect as well as the interactive effect of the two or more independent variables” (A. K. Singh, 1997, P. 394)
3.3.3 Reasons behind the selection of factorial design:

“Experimental design is the blueprint of the procedures that enable the researcher to test hypotheses by reaching valid conclusions about relationships between independent and dependent variables. Selection of particular design is based upon the purposes of the experiment, the type of variables to be manipulated and the conditions or limiting factors under which it is conducted” (Best & Kahn, 2001, P. 146)

The research design for the present study is factorial design. Within the factorial design, it is possible to assess the effects of each independent variable separately, as well as their conjoint or simultaneous effects. Thus the factorial arrangement of the treatments has two major advantages as given below,

1) Since the same group of subjects is utilized, in estimating effects from two or more treatment dimensions, there is an economy of both time & personnel.

2) The simultaneous application of treatments makes possible the elucidation of interactive effects among the treatment dimensions. Considering all the advantages of factorial design & the nature of this research study, it was decided to use factorial arrangements of the variables selected as independent variables.

The purpose of the present research was to study the effectiveness of the CAI programme against the traditional method of teaching Geography thus the researcher wanted to compare the application of CAI programme with Traditional teaching method of Geography.

CAI programme is the first independent variable of the research, along with this, researcher has also decided to observe the effect of CAI
programme on three levels of intelligence. According to Dr. Bloom, “Intelligence Measures for 25% of the variance on the achievements. All the studies suggest that the age and general mental ability are the two important variables to be considered in the process of concept attainment”. (Dr. Bloom, 1976 P. 52)

Levels of intelligence are the second independent variable in the present research thus the present research includes two independent variables hence researcher has decided to use the factorial design.

Here the first independent variable is CAI programme and the second independent variable is three levels of intelligence, (high, middle & low) Hence 2 x 3 factorial design was selected for the purpose of the study. Following table shows the factorial design for the present research.

**Factorial Design.**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Levels of Intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>A.CAI programme</td>
<td>(1)</td>
</tr>
<tr>
<td>B.Traditional Method</td>
<td>(4)</td>
</tr>
</tbody>
</table>

**Table No. 6**

Since, intelligence level is one of the important variable in the present study, researcher had decided to categorize the students on the basis of the means of the percentile points on the intelligence test. (Reven’s Progressive Matrices)

These percentile points are given by the well-known institute “Jnana Probodhini”, Pune. The criteria is shown in the following table.
Criteria set for the selection of students on R.S.P.M.

<table>
<thead>
<tr>
<th>Percentile point at the age of 11+</th>
<th>Level of intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 and above</td>
<td>High Level</td>
</tr>
<tr>
<td>Between 25 to 75</td>
<td>Middle Level</td>
</tr>
<tr>
<td>Below 25</td>
<td>Low Level</td>
</tr>
</tbody>
</table>

Table No. 7

3.4 VARIABLES:

“Variables are the conditions or characteristics that the experimenter manipulates controls or observes. The Independent variables are the conditions or characteristic that the experimenter manipulates or controls in his or her attempt to ascertain their relationship to observed phenomena. The dependant variables are the conditions that appear, disappear or change as the experimenter introduces, removes or changes independent variable. Extraneous Variables are those independent variables which are not related to the purpose of the study but may affect the dependent variable”*6 (Best & Kahn, 2001, P. 137)

Experimentation is most often described in terms of a highly controlled investigation, in which the researcher manipulates the independent variable, and controls all other extraneous variables to determine if such manipulation generates change in the dependent variables. The crucial factors in experimental design are the selection of the independent & dependent variables, and the control of extraneous variables.

In this Research study-

1 a. **Independent variables** are the instructional material based on computer Assisted Instruction Programme &

b. The three levels of Intelligence i.e. high, middle and low.
2. **Dependent variable**: The attainment of students in post test based on content selected for the experiment.

3.4.1 **Control of variables** –

One of the major purposes of experimental design is to ensure that the results observed may be attributed with limits of error, to the treatment only. If difference brought about in the dependent variable results from some extraneous variables, and possibly unconsidered or unforeseen variables, these variables may mask the original effect of the treatment variables. Then the experiment lacks in the internal validity. To ensure the maximum internal validity, efforts were done for the control of these variables in following different ways.

3. **Extraneous Variable**: Extraneous variables are age, teacher variability, time period, content, test.

The researcher had tried to control the effect of the extraneous variables in the following manner.

- **Age**: All the students included in the study were of the age of 11 + (i.e. students studying in Std. VII)
- **Teacher Variability**: This factor was controlled by involving only one teacher i.e. the researcher to teach all the groups.
- **Time Period**: Time allotted for teaching was same for all the groups.
- **Content**: Units selected for the experiment were same for all the groups.
- **Test**: Tests were same for all the groups.
3.5 POPULATION:

“A population may be defined as any identifiable and well specified group of individuals. All primary teachers, all housewives etc. are examples of population”  

(Singh A. K., 1997, P. 287)

The researcher was interested in doing the work in Marathi Medium Schools, because:

(1) While reviewing the related literature, the researcher came to know that maximum researches related to CAI programme were conducted in English Medium Schools and hence the CAI programmes prepared were only in English Language.

(2) It is also a known fact that the number of Marathi Medium Schools is more than English Medium Schools.

<table>
<thead>
<tr>
<th>Total Schools in Pune Municipal Corporation Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporation Schools</td>
</tr>
<tr>
<td>Granted Schools</td>
</tr>
<tr>
<td>Non Granted Schools</td>
</tr>
<tr>
<td>English Medium School</td>
</tr>
<tr>
<td>(46)</td>
</tr>
<tr>
<td>97+37</td>
</tr>
<tr>
<td>(80)</td>
</tr>
</tbody>
</table>

The researcher has restricted the study to Marathi medium private as well as aided secondary schools. The population for the study is Marathi Medium private as well as aided secondary schools located in Pune Municipal Corporation area. The total No. of such types of schools is 51.
3.6 SAMPLE:

“The selected number of persons or objects is known as sample or in other words a sample is any number of persons selected to represent the population according to some rule or plan.” (Singh A.K., 1997, P. 287)

3.6.1 Purposive Sample: “Purposive Sample, a kind of non probability sample, is one which is based on the typicality of the cases to be included in the sample. The investigator has some belief that the sample being handpicked is typical of the population. Purposive sample is also known as a judgmental sample because the investigator on the basis of his impression makes a judgment regarding the concern cases which are thought to be typical of the population.” (A. K. Singh, 1997, P. 299)

3.6.2 Advantages of Purposive Sampling:

1. Purposive sampling is less costly.
2. It is more readily accessible to the investigator.
3. It also gives guarantee that those individuals will be included in the sample that are relevant to the research design.

3.6.3 Sample for the study - In this research the main objective was to study the effectiveness of computer assisted instruction programme against the traditional teaching method of Geography, hence the most important criterion for selecting the schools for the purpose of experiment was the availability of well equipped computer laboratory.

By using purposive sampling method the researcher has selected six Marathi medium schools (Private as well as aided) for the purpose of the experiment. These six schools gave permission to the researcher to conduct the experiment in only one division of Std. VII.
While selecting the schools the researcher had also taken care that the schools are from different areas of Pune Municipal Corporation area. They have a mixed population from the different Socio-economic strata. The sample of schools includes all types of schools i.e. only boys, only girls and co-education schools.

The list of names of the schools and number of the students which form the sample of the study is shown in the following table

<table>
<thead>
<tr>
<th>The list of Name of Schools &amp; Number of Students included in the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name of the School</strong></td>
</tr>
<tr>
<td>1. Ahilyadevi Highscool for Girls</td>
</tr>
<tr>
<td>2. Bharat English School</td>
</tr>
<tr>
<td>3. Maharashtra Vidyalaya</td>
</tr>
<tr>
<td>4. P.E.S. Girls Highschool</td>
</tr>
<tr>
<td>5. Raosaheb Patwardhan Highschool</td>
</tr>
<tr>
<td>6. Sushelabai Veerkar Highschool</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Table No. 8

The total no. of students is 295. The researcher has selected 280 students out of these 295 Students for the study. These 280 students are equally divided into control and experimental group, by equating the means of the percentile points on the intelligence test (RSPM). To equate the means of the percentile points the researcher has to omit 15 students of high level of intelligence from the comparison of CAI and TT method. The 15 students omitted from the comparison are the extreme cases having percentile point 99 + so they are disturbing the means of the group.
No. of Students included in the study.

<table>
<thead>
<tr>
<th>Levels of Intelligence</th>
<th>Control Group</th>
<th>Experimental Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>High Level</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Middle Level</td>
<td>45</td>
<td>26</td>
</tr>
<tr>
<td>Low Level</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table No.:9

The column of mean represents the means of the percentile points on R.S.P.M of respective groups.

3.7 **TOOLS OF RESEARCH:**

The following tools were used to collect the information from teachers teaching Geography to Std. VII

3.7.1 **Data Collection Tools:**

1. **Questionnaire:** “A Questionnaire is used where factual information from the respondents is desired”\(^{10}\) (Singh A. K., 1997, P.193). For this research it was essential to know the existing situation of teaching of Geography in Marathi medium private as well as aided secondary schools. For this purpose the researcher had prepared a questionnaire containing 24 questions based on the different aspects of teaching of Geography. Majority of them are open-ended. Keeping in mind the characteristics of a good questionnaire the researcher tried at her level best to make the questionnaire accurate.
To ensure accuracy the questionnaire was given for checking to the experts in the field of education. (See Appendix No. C III)
All the experts gave their valuable suggestions regarding the nature of the questionnaire. The question no. 8, 9, 12, 17, 21, 22, 23 were modified according to the suggestions of the experts. Finally the questionnaire was approved by the Research Guide. (See Appendix No. A II)

2. **Opinionnaire**: The Opinionnaire was used to get the information about the difficulty level of the units from the Physical Geography section of the textbook of Geography of Std. VII published by Maharashtra State Bureau Of Text Book Production and Curriculum Research, Pune. It was also shown to the experts and along with the questionnaire it was given to the Geography teachers. (See Appendix No. A III)

3. **Graphical Representation**: It was used to compare the results of the students of experimental group. and control group.

3.7.2 **Statistical Tools**: The researcher had made use of the following statistical tools in the research.

1. **Percentage**: It was used in the analysis of responses given by the Geography teachers for the questionnaire and opinionnaire.

2. **ANOVA (‘F’ test) with ‘t’ ratio**: For Analyzing the data, analysis of variance was used. It is a measure of dispersion obtained by taking the mean of squares deviations of the observed values from their mean in a frequency distribution. In analysis of variance the total sum of squares of the sample may be analyzed into points i.e. into groups of two or more than two. It is a single composite test that can test simultaneously the whole sample distribution obtained and conclude the nature of the sample.
3.8 THE SURVEY:
For any research it is always beneficial to know the present situation of the topic. Here in this research, the researcher is interested in studying the effectiveness of CAI programme against the traditional teaching method of Geography. For this purpose it has become necessary to know the present situation of teaching of Geography in schools, especially about the use of various traditional teaching methods and use of audio-visual aids. The researcher had carried out a survey in the schools for the betterment of the research.

The main objectives behind this survey were, Objective no.1 – To know the limitations of traditional teaching method of Geography. Objective no 2 – To know the reasons behind the limitations of traditional teaching method of Geography. For fulfillment of these objectives the researcher had prepared a questionnaire containing twenty four questions related to the teaching of Geography. The questionnaire was given to experts for their opinions. After getting their valuable suggestions the questionnaire was modified and finalized.

Sample for the Survey :- The sample for the survey was the teacher teaching Geography in secondary schools which were selected for the experiment.

No of teachers - 25
The questionnaire was given to the teachers who are teaching Geography to Std VII.

3.9 PILOT STUDY:
A Pilot study was conducted to test the validity of tools in the research study. This served as a preliminary trial for the programme which the researcher has prepared for the purpose of experiment. While selecting the school for Pilot Study the criterion was availability of well equipped computer laboratory and the co-operation given by school authorities.
Hence the pilot study was carried out in N.M.V Girls High School, Pune. Which was not included in the sample for the experiment.

3.9.1 Content for the Pilot Study:
The researcher has selected some part of the lesson ‘Brazil’ from Std VII Geography textbook, to prepare the Computer Assisted Instruction programme for the pilot study. Total 42 slides were used for the power point presentation.

In the pilot study following points were studied.

a. The total time required for viewing the entire presentation.
b. The attention span of the students.
c. Words or concepts not understood by the students.
d. Whether the animation and sound effect given was required or was a distraction.
e. Attractiveness of the slides.
f. Reframing of recapitulation questions for better understanding.

3.9.2 Procedure of Pilot Study:
For the purpose of pilot study Std. VII B was selected, the strength of this class is 65. These 65 students were divided into two groups. One group has been chosen for CAI. programme and the other group was exposed to traditional teaching of the content. Intelligence test was administered to both the groups. For the traditional teaching the researcher has prepared two lesson notes on the same part of Brazil and taught it for the same time period and at the same time when the first group was exposed to the CAI. programme.

After the completion of the teaching. The researcher had administered post test to both the groups and the data was collected and analyzed. According to the suggestions collected based on the observations of the pilot study the researcher had modified the CAI programme prepared for
the fulfillment of objective no. 4 i.e. to study the effectiveness of CAI programme.

### 3.10 SELECTION OF THE TOPICS:

Reasons behind selecting the topics Brazil and Hydrosphere for the experiment.

1. **The nature of Geography:** Basically one can divide the subject Geography in two major part i.e. Physical Geography and Human Geography, which are the two major branches of Geography. Physical Geography is conceptual in nature and is more difficult to understand. On the contrary Human Geography is easy to understand and interesting because it is related to our day to day life.

   To give justice to both the major branches of Geography, the researcher has selected one topic from both the branches of Geography.

2. From the analysis of the opinionnaire the researcher came to know that according to the teachers “Hydrosphere” is the most difficult topic for the students studying in Std. VII.

### 3.11 REASONS OF SELECTING STD VII FOR THE PURPOSE OF RESEARCH:-

The 11+ age group students i.e. (the students Studying in 7th Std.) are going from the period of transaction. It is a stage between the premature and adolescent stage. According to Piaget’s theory of Cognitive development, these students of 11+ Age falls under the “the period of concrete operations”. Concrete operations mean the stage of cognitive development when the child is able to direct his attention away from the static condition and can focus on the whole set of successive changes that occur in the process of transformation. At this stage the child can reason well. The child of 7-11 years acts as though the primary task was to organized and order what is immediately present. (Dr. Chauhan S.S. 1988 P. 91)
The researcher thought that if this is a starting point of concrete operation it will be beneficial for the experiment to select the 11+ Age group students i.e. the students studying in Std VII because they have developed the capacities or abilities of organizing and ordering the matter which is presented before them. It is required while observing the different slides on the screen of the computer.

3.12 TEST OF CONTENT KNOWLEDGE

Preparation and administration

To prepare the test on content of Geography the researcher has selected concepts from Std. IVth, Vth, VIth, Geography syllabus which are related to the topics selected for the experiment i.e. Brazil and Hydrosphere from Std.VII, Geography textbook. Following Chart shows the relation among these concepts from IVth, Vth, VIth, VIIth, Std.

List of similar topics from std IV,V,VI,VII, of Geography Textbook

<table>
<thead>
<tr>
<th>1. Regional Geography</th>
<th>2. Physical Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. VII</td>
<td>Std. VII</td>
</tr>
<tr>
<td>World</td>
<td>Movement of Ocean</td>
</tr>
<tr>
<td>S. America</td>
<td>Sea Waves</td>
</tr>
<tr>
<td>Brazil</td>
<td>Ocean Currents</td>
</tr>
<tr>
<td>From Location to Human Life</td>
<td>Tides</td>
</tr>
</tbody>
</table>

Table No 10
The main objective of giving the test of content knowledge was to find out the difficult topics from the syllabus. After analysis of the data regarding the scores of the students on the content test it was found that the questions based on the topic 'Hydrosphere' were very difficult for the students to solve, nearly 90% students were unable to solve the questions based on the topic Hydrosphere and hence the topic hydrosphere was selected for the experiment. (See Appendix No.CII)

For preparing the test the researcher has taken guidance from experts in Geography and the research guide. (See Appendix No.CIII)

The test of content knowledge was administered to the students of Std. VII in the beginning of the academic year 2006.

3.13 STANDARD PROGRESSIVE MATRICES (RAVEN’S TEST OF INTELLIGENCE)

Raven’s S.P.M. Published in 1938 was constructed on a priori assumption that, if Spearman’s (1923) Principle of noegenesis were correct, it should provide a test suitable for comparing people with respect to their immediate capacities for observation and clear thinking.

1. It is a well known, standardized test used all over the world.
2. The test is nonverbal test of intelligence, therefore it eliminates the effects of the difference in linguistic ability on the part of the subjects.
3. It can be administered either as an individual test or as group test.
4. It is a culture free test because socio-cultural factors do affect the performance.

The researcher has used this test to divide the students into three different levels of intelligence.
3.14 POST TEST - PREPARATION AND ADMINISTRATION.
To measure the effectiveness of CAI Programme against traditional teaching method of Geography on students of Std. VII the researcher has used a Post Test.

For preparing the post test on selected topic i.e. Brazil & Hydrosphere the researcher took guidance from the experts in Geography from colleges & schools.

The test was prepared as per the objectives and lastly it was finalized under the guidance of research guide. The post test was administrated after the completion of teaching programme & implementation of CAI Programme. (See Appendix No.C II)

3.15. DEVELOPMENT OF COMPUTER ASSISTED INSTRUCTION PROGRAMME
CAI is the recent development in educational technology. For this research the researcher has developed a computer Assisted Instruction some of programme on the topics Brazil & Hydrosphere to teach Students of Std. VII.

The first step of developing the CAI programme was content analysis and the making of frames according to the points of content analysis.

3.15.1 Content Analysis of the Units - Brazil and Hydrosphere

Brazil :
1. Fact & Figure :-  • Location & extent.
   • Physical Divisions
   • Information about Climate.
   • Vegetation, animal life.
   • Occupation
   • Human Life.
1. Food
2. Clothing
3. Houses
4. Cultural developments
5. Industries
6. Sports
7. Important Cities

2. Principles, Rules Concepts • Climate, Vegetation, animal life

3. Cause & effect Relation • Occupations
e.g. – What is effect of climate on human life?

Reasons behind the presence of equatorial evergreen forest in the basin of river Amazon.

Hydrosphere:
Movements of Ocean

Concepts:  1. Sea Waves:
• Reasons of formation of waves
• Structure of sea wave

Diagrams:  • Crest
• Trough
• Wavelength
• Wave height.
2. **Ocean Currents**: Reasons

   ↓

   1. Temperature of ocean water
   2. Planetary wind.
   3. Density of sea water.

   **Fact**: Types of ocean currents (Map)

   **Concepts**: Warm and cold currents
   Effect of ocean currents.

3. **Tides**

   Concept & Definition: What is Tide?

   Types of Tide

   - Concept
   - Neap Tide
   - Spring Tide
   - Reasons of Tides

   **Fact & Figure**: Diurnal, half Diurnal Tide

   Uses of Tides to human being.

   1. Fishing
   2. Salt pans
   3. Hydroelectric Power.
3.15.2 The development of CAI program is shown in the following flow chart. (Appendix BI).

Steps in CAI Programme Development

1. Selection of Unit
   ↓

2. Development of Modular Structure
   ↓

3. Development of flow chart
   ↓

4. Designing frames
   ↓

Preparing Screens with reference to actual programming →

<table>
<thead>
<tr>
<th>Screen</th>
<th>Layout</th>
<th>Graphics</th>
<th>Colors</th>
<th>Timing</th>
<th>Animation</th>
<th>Sound</th>
<th>Use of control</th>
</tr>
</thead>
</table>

Programme Phase

↓

Validation by experts

↓

Testing

↓

Material is ready to bring into practice
After preparation of the slides, all slides are verified by the guide. Her valuable and constructive guidance has really increased the quality of the CAI Programme.

After that with the help of pilot study the effectiveness of the programme was tested in N.M.V. Girls High schools. Whatever suggestions the researcher has got from the study, the programmer has been modified accordingly.

Last step in the development of CAI programme is the implementation of actual CAI programme in the selected schools for the experiment.

3.15.3 Following are the highlighted features of CAI Programme:-

- CAI Programme is prepared as a self study material for VII Std. Students.
- CAI Programme is user friendly in real sense.
- Information and explanation of points related to the topics Brazil and Hydrosphere is very accurate, complete, useful, current and meaningful. It is collected even from the websites. The names of websites are given in the bibliography.
- Pictures, slides, graphics, and animation, are used to make the CAI Programme more interesting and lively. Major qualities of slides are given below :-
  1. Pictures, Photographs, Graphics and Animations are very attractive, proper, and relevant.
  2. All the effects and animations are automotive.
  3. Motion pictures increase the quality and attractiveness of the slides.
4. Due to use of pictures and variety of color combinations, each and every slide becomes unique.

5. Most of the pictures and background are taken from the clipart, Google and from different websites.
   - Programmes style is as if the teacher is talking to the students and small parts of the content is provided with the help of the slides.
   - One can read the matter as many times as he wishes as per his pace.
   - To avoid monotony in the programme and to make it more lively and interesting the background of each slide was made colorful. It was hoped that students with a good visual memory would be able to associate the background colors with different content and thus remember distinct content on different slides in a better way.

The Module consists of 4 presentations.
First is related to Brazil – Physical. It has 42 slides.
Second is related to Brazil – human Geography 33 slides.
Third presentation is on the topic Hydrosphere and it includes 42 slides.
The last presentation is an evaluation measure i.e. an objective test for fixation of the knowledge. It has 4 slides.
All the slides are prepared as per the content analysis.
The slides are divided into sub topics as shown in the following table

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Subtopic</th>
<th>Points</th>
<th>No. of slides</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to subject</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td><strong>Brazil Physical Part</strong></td>
<td>Location and extent: 4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>physical features climate: 4</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vegetation and animal life: 4</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Brazil :-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Introduction Human Geography.</td>
<td>Minerals: 1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occupations: 4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industries: 4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication&amp; Trade: 4</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Life of the People</td>
<td>Food, Shelter, Clothing, Houses Sports, Culture: 14</td>
<td>08</td>
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<td></td>
<td>Important Cities</td>
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<td>Hydrosphere Introduction</td>
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<tr>
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<td>Sea Waves</td>
<td>Causes of sea waves: 2</td>
<td>14</td>
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<td>structure of waves: 6</td>
<td>20</td>
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<td>Ocean Currents</td>
<td>Formation: 2</td>
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<td>Causes: 2</td>
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<td>Types: 2</td>
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<td>Effects: 2</td>
<td>20</td>
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<td>Tides</td>
<td>Causes: 2</td>
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<tr>
<td></td>
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<td>Type: 2</td>
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</table>

Total: 121

Table No. 11
3.16 PROCEDURE OF THE PROGRAMME

This part describes in detail the Implementation of the CAI Programme and evaluation strategy prepared by the researcher.

The experiment was carried out in the month of June 2006. The researcher has prepared a time table for the execution of the programme by taking into consideration the daily time table of the schools and the restrictions stated by the school.

The six schools were divided into two groups: control group & experimental group.

**Step I:** The six schools were divided into two groups

<table>
<thead>
<tr>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. P.E.S. Girls High School</td>
<td>1. Ahilyadevi High School</td>
</tr>
<tr>
<td>2. Raosaheb Patwardhan High School</td>
<td>2. Bharat English School</td>
</tr>
</tbody>
</table>

**Step II** The researcher had administered a test based on content knowledge of Geography, topic were selected from syllabus of IV V VI Geography text books in the beginning of the academic year 2006-2007 i.e. in the month of June to both the groups i.e. control and experimental group.

**Step III.** On the next day the intelligence test i.e. Revenue Standard Progressive Matrices was administered to both the groups for dividing the students into three different levels of intelligence.

**Step IV.** After the administration of both the test i.e. Content test & intelligence test the researcher had started the actual experiment researcher had started the actual experiment. The control group was not exposed to CAI programme. The researcher her self taught the selected
units to the control groups by using traditional teaching method, for that purpose she prepared lesson notes, teaching aids on the selected units, Brazil and Hydrosphere according to school time table. Simultaneously the experimental group was exposed to the CAI programme for the same time period. Before the implementation of CAI programme proper and necessary instructions were given to the students. The researcher was present at the time when the students observed the power point presentation on the selected units.

**Step V.** After the completion of traditional teaching programme to control group and presentation of CAI programme to experimental group, the researcher had administered ‘Post test’ to both the groups.

With the help of all these steps the researcher had completed the experimentation in the schools which took a period of one month.

(For Time table of the programme see appendix no.B IV)
REFERENCES


3. Ibid.


8. Ibid.

