Chapter III
Method of the Study
CHAPTER III

METHOD OF THE STUDY

In the preceding chapters, the theoretical framework of the variables, objectives, significance of the problem, hypotheses, development and description of the tools were discussed. The present chapter has been devoted to the method of the study that was followed for the analysis of the collected data.

The method of the study has been discussed under the following headings in this chapter:

- Tools Used
- Sample
- Design of the study
- Procedure
- Statistical Techniques

TOOLS USED

The following tools were used for collecting the data:

- Instructional packages based on Barnlund’s Transactional Model of Communication (developed and validated by the investigator)
- Entry Behaviour Test (developed and validated by the investigator)
- Formative Unit Tests (developed and validated by the investigator)
- Summative Test (developed and validated by the investigator)
- Life Skills Questionnaire (adopted from Botvin’s LST Program, 1985 and validated by the investigator)
- Revised Two – Factor Study Process Questionnaire for Learning Approaches (developed and standardized by Biggs, J., 2001)

SAMPLE

A sampling problem is raised when we want to learn something about the frequency of an attribute or combination of attributes within a population, through a study of some part of the population. A population is any collection of individuals (or organizations or communities) whose boundaries can be stated; that is, for which rules can be given for deciding whether a particular individual should be included or not. A sample is a subset
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of the population. The aim in sampling is to choose the subset in a way that it will serve as an adequate representative of the population as a whole (Weiss, R. S., 1968). A population can be defined as the totality of all possible observations or measurements or outcomes (Hooda, R. P., 1994).

Inferences about the parameters of a population are made from statistics that are calculated from a sample of N observations drawn at random from this population. If we continued samples of size N from this population, we should not be surprised if we found some differences among the values of the sample statistics obtained. Indeed, it is this observation that has led to the concept of sampling distributions. A sampling distribution is a theoretical probability distribution of the possible values of some sample statistics, which would occur if we were to draw all possible samples of a fixed size from a given population (Runyon and Haber, 1976).

Sampling is an example of inductive logic by which conclusions are inferred on the basis of instances (Foreman, E. K., 1991). In many cases where observed instances are identical, or where actual differences are too small to affect the conclusions to be drawn, no more than one such instance need to be observed, and repeated observations would merely serve to confirm the same result. Where observed instances vary, however, it may be risky to make estimates or draw conclusions from just a few. Reliable estimates and inferences then require observation of a sufficiently large number of instances that are adequately representative of all such instances. These matters are the essential concern of sampling practice and theory.

There is usually a trade-off between the desirability of a large sample and the feasibility of a small one. The ideal sample is large enough to serve as an adequate representation of the population about which the researcher wishes to generalize and small enough to be selected economically – in terms of subject availability, expense in both time and money, and complexity of data analysis (Best and Kahn, 2000).

It is often stated that samples of 30 or more are to be considered large samples and those with fewer than 30, as small samples. More important than size is the care with which the sample is selected. Various methods of sampling can be grouped under two broad heads (Gupta, S.P., 1997):

A. Probability Sampling (Random Sampling)
B. Non - Probability Sampling (Non -Random Sampling)
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**PROBABILITY SAMPLING METHODS**

Probability sampling methods are those in which every item in the universe has a known chance, or probability of being chosen for the sample.

- **Simple Random Sampling** refers to that sampling technique in which each and every unit of the population has an equal opportunity of being selected in the sample. In simple random sampling which items get selected in the sample is just a matter of chance – personal bias of the investigator does not influence the selection. The word random does not mean haphazard or hit-or miss- it rather means that the selection process is such that the chance only determines which items shall be included in the sample. To ensure randomness of selection one may adopt either the Lottery Method or consult table of random numbers. It is risky to take randomization for granted.

- **Systematic Sampling:** Selecting one unit at random and then selecting additional units at evenly spaced intervals until the sample has been formed, forms a systematic sampling. This method is popularly used in those cases where a complete list of the population from which sample is to be drawn, is available. The list may be prepared in alphabetical, geographical, numerical or some other order. The first item is selected at random generally by following the Lottery Method. Subsequent items are selected by taking every \( k' \) item from the list where \( k' \) refers to the sampling interval or sampling ratio, i.e., the ratio of population size to the size of the sample. Symbolically:
  \[
  K = \frac{N}{n}
  \]
  where \( k = \) Sampling Interval, \( N = \) Universe Size & \( n = \) Sample Size.

- **Multi-stage Sampling or Cluster Sampling:** Under this method, the random selection is made of primary, intermediate and final units from a given population. There are several stages in which the sampling process is carried out. At first, the initial stage units are sampled by some suitable method, such as simple random sampling. Then, a sample of second stage units is selected from each of the selected first units, again by same as or different from the method employed for the first stage units. Further stages may be added as required.

- **Stratified Sampling:** In stratified sampling the available information concerned with the population is used to design a more efficient sample than obtained by the simple random procedure. It is applicable when the population is composed of sub-groups or strata of different sizes so that a representative sample must contain
individuals drawn from each category or stratum in accordance with the sizes of the sub-groups. Within each stratum or sub-group, the sampling is random or as nearly as possible. This involves dividing the population into a number of groups or strata where members of a particular characteristic.

**NON-PROBABILITY SAMPLING METHODS**

Non-probability sampling methods are those, which do not provide every item in the universe with a known chance of being included in the sample. The selection process is, at least, partially subjective.

- **Judgement Sampling:** In this method, the investigator exercises his judgement in the choice and includes those items in the sample, which he thinks are most typical of the universe with regard to the characteristics under investigation.

- **Quota Sampling:** In a quota sample, quotas are set up according to some specified characteristics. Within the quota, the selection of sample items depends on personal judgement. Quota sampling and stratified random sampling are similar in an as much as in both methods the universe is divided into parts and the total sample is allocated among the parts. However, the two procedures diverge radically. In stratified random sampling the sample within each stratum is chosen at random. But, in quota sampling, the sampling within each cell is not done at random; the field representatives are given wide latitude in the selection of respondents to meet their quotas.

- **Convenience Sampling:** A convenience sample is obtained by selecting convenient population units. Convenience samples are prone to bias by their very nature – selecting population elements, which are convenient to choose, almost always make them special or different from the best of the elements in the population in some way.

- **Purposive Sampling:** A sample is built up which enables the investigator to satisfy his specific needs in the project. The principle of selection in purposive sampling is the investigator’s judgement of the typicality of his interest. A sample may then be expectedly chosen because, in the light of the available evidence, it mirrors some larger groups with reference to a given characteristic. Random sampling formulas apply more or less accurately to purposive samples (Garrett and Woodworth, 1996).
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The sample in the present investigation was drawn at two levels:

- The School Sample.
- The Student Sample.

The School Sample:

The School Sample was drawn from the representative Secondary Schools of the Union Territory of Chandigarh where the medium of instruction was English and schools were of co-educational type. In order to satisfy the real effort in experimental research, the logical statistical inference of random sampling was initially employed to select schools.

The schools were compared with regard to following criteria: schools had almost the same classroom climate, physical facilities, teacher – taught ratio, sex ratio etc. A list of such schools was formed and four schools were randomly selected from this list. Two of these schools were randomly allocated to experimental group and two were assigned to control group. Thus, four schools, which fulfilled the criteria, were approached for seeking the permission to conduct the experiment. The names of the schools along with the number of students selected for the experiment have been listed in Table 3.1.

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>NAME OF THE SCHOOL</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. *</td>
<td>Government Model Senior Secondary School, Sec-19, Chandigarh</td>
<td>66</td>
<td>41</td>
<td>107</td>
</tr>
<tr>
<td>2. *</td>
<td>Government Model High School, Sec-28, Chandigarh</td>
<td>26</td>
<td>30</td>
<td>56</td>
</tr>
<tr>
<td>3. **</td>
<td>Government Model Senior Secondary School, Sec-22, Chandigarh</td>
<td>65</td>
<td>42</td>
<td>107</td>
</tr>
<tr>
<td>4. **</td>
<td>Government Model Senior Secondary School, Sec-20, Chandigarh</td>
<td>35</td>
<td>31</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>192</td>
<td>144</td>
<td>336</td>
</tr>
</tbody>
</table>

* - Experimental Group  ** - Control Group

The Student Sample:

The study was initiated on 336 Xth grade secondary school students studying in the Union Territory of Chandigarh. These were English medium, co-educational schools, affiliated to the Central Board of Secondary Education (C.B.S.E.), New Delhi. Most of
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these students belonged to middle class families. A list of the schools under the administration of the Union Territory of Chandigarh was procured from the Director Public Instructions (Schools) through the District Education Office and four schools were selected randomly for the present investigation.

Each of the selected four schools had more than one sections of tenth grade students. Hence two sections from each school were randomly chosen as intact groups and two schools with N= 163 were considered for conducting experiment and the remaining two were selected for the control group with N=173. In the experimental group, students were imparted instruction through Barmlund’s Transactional Model of Communication (BTMC). Their own teachers taught the second group (control group) through Conventional Group Learning (CGL). The structure of the two groups has been shown in Table 3.2 and Table 3.3.

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>NAME OF THE SCHOOL</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Government Model Senior Secondary School, Sec-19, Chandigarh</td>
<td>66</td>
<td>41</td>
<td>107</td>
</tr>
<tr>
<td>2.</td>
<td>Government Model High School, Sec-28, Chandigarh</td>
<td>26</td>
<td>30</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>92</td>
<td>71</td>
<td>163</td>
</tr>
</tbody>
</table>

Table 3.3
Structure of the Initial Sample: CGL
(Control Group)

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>NAME OF THE SCHOOL</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Government Model Senior Secondary School, Sec-22, Chandigarh</td>
<td>65</td>
<td>42</td>
<td>107</td>
</tr>
<tr>
<td>2.</td>
<td>Government Model Senior Secondary School, Sec-20, Chandigarh</td>
<td>35</td>
<td>31</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>100</td>
<td>73</td>
<td>173</td>
</tr>
</tbody>
</table>

The Revised Two-Factor Study Process Questionnaire for Learning Approaches was used for classifying students into Deep Approach and Surface Approach of Learning. A few (N=40) students were dropped out of the study at the final stage of the data
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analysis, who were either absent or were not found appropriate to be selected on the basis of their Learning Approach.

The structure of the final sample for experimental and control groups comprised of N=296 based on Deep and Surface learning approach has been given below in Table 3.4.

Table 3.4
Categorization of the Final Sample according to Deep and Surface Approach of Learning

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>TREATMENT GROUPS</th>
<th>DEEP APPROACH</th>
<th>SURFACE APPROACH</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BTMC</td>
<td>93</td>
<td>46</td>
<td>139</td>
</tr>
<tr>
<td>2.</td>
<td>CGL</td>
<td>100</td>
<td>57</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>193</td>
<td>103</td>
<td>296</td>
</tr>
</tbody>
</table>

DESIGN OF THE STUDY

A research design that is reviewed must be appraised partly in terms of the extent to which it was adequately designed (Travers, R.M.W., 1958). Design has two aspects:

➢ First, there is the matter of whether it permits the collection of the evidence that is necessary to solve the problem.

➢ Second, whether it permits the collection of the maximum amount of information with the least amount of effort or not.

Experimental design always involves the establishment of conditions such that a comparison can be made between the effects of two or more conditions. The process of planning and structuring experiments is commonly called designing experiments. The output of the process is an experimental design, and it includes all of the components of methodology needed to test hypotheses through a set of ground rules that uses empirical data as a basis for decisions of support or non-support of the research hypothesis (Hopkins, C. D., 1976).

The present study employed an experimental method with a 2 x 2 factorial design. Computational procedures were followed according to the techniques given by Garrett and Woodworth (1966) and Broota (1989). In a 2 x 2 factorial design, instructional
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strategies and learning approaches were two independent variables. Out of these two independent variables, Instructional Strategies were studied at two levels viz:

- Barnlund’s Transactional Model of Communication (BTMC).
- Conventional Group Learning (CGL)

Whereas the second independent variable, Learning Approaches were studied at two levels viz:

- Deep Approach (DA)
- Surface Approach (SA)

The dependent variables in the present study were life skills viz skill of Acquiring Knowledge (Achievement), skill of Critical Thinking, skill of Decision Making and Communication Skill. The four life skills were selected on which effect of independent variables was studied viz:

- Life Skills:
  - Skill of Acquiring Knowledge (Achievement)
  - Skill of Critical Thinking
  - Skill of Decision Making
  - Communication Skill

The schematic layout of the experimental design has been given in Fig.3.1.
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- Life Skills:
  - Skill of Acquiring Knowledge
  - Skill of Critical Thinking
  - Skill of Decision Making
  - Communication Skill

where
- DA-Deep Approach
- SA-Surface Approach
- BTMC-Barnlund’s Transactional Model of Communication
- CGL-Conventional Group Learning

Fig. 3.1: Layout of the Design.

CONTROLS IN EXPERIMENTAL DESIGN

The design of research is closely associated with the use of experimental controls (Travers, R. M. W., 1958). They are defined as those factors, which are controlled by the experimenter to cancel out or neutralize any effect they might otherwise have on the observed phenomenon (Tuckman, B. W., 1972).

By selecting a control group made up of persons who, as nearly as possible, have the same idiosyncrasy as the experimental group subjects the researcher will minimize selection invalidity. The following approaches deal with control measures:
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- **Randomization** is a procedure for controlling selection variables without first having to identify them. A researcher randomizes by beginning with a subject pool and *randomly assigning members* of this pool to the experimental and control groups. Tables of random numbers, lottery system are popular techniques of random sampling.

- **Matched–Pair Technique.** Here the researcher first decides which control variables applicable to individual differences are his most prominent sources of problems in the experiment he is designing. It is necessary then for the researcher to identify within the subject pool the pairs of persons who are most equivalent on the specific variable(s) he want to control. Then, one member of each pair, chosen from among the two members on a random basis, would be assigned to the experimental group and the second to control group. Each of the remaining pairs would be split similarly. The resultant two groups would be considered reasonably equal on the measures in question, thus providing control over selection variables.

- **Method of Constancy.** Experiences other than those resulting from the manipulation of the independent variable should be constant across the experimental and control groups. If instructions need to be given, these should be written in advance and then read to both groups to guarantee their *constancy across conditions*. Tasks experiences, or procedures not unique to the treatment should be identical for experimental and control groups.

- **Method of Counter Balancing.** In experiments where subjects perform more than one task or take more than one test, it is often necessary to control for the *effects of order*, that is, for apparent progressive shifts in a subject’s response as he continues to serve in the experiment. These shifts may be a function of practice or of fatigue (Tuckman, B. W., 1972).

In the present investigation, the controls were exercised using the following techniques of controlling extraneous variables:

- **Randomization was** exercised at the initial stage of selecting schools. Out of a list of 27 schools, four were again chosen randomly. Two schools were again randomly selected as experimental group. There were 4 sections of Xth grade students in each school; hence sections were also selected randomly from each school for conducting experiment.

- **Matching of the groups** was one of the controls wherein all the relevant variables were controlled. The matching of the groups was done on all the relevant variables
like intelligence, age, gender, socio-economic status and entry behaviour etc. of the learners. The essentiality of this act was done to two different instructional strategies (BTMC/CGL) being administered in the four schools to ensure equality in groups.

- **Method of Counter Balancing** was used by
  - Observing same sequence in administration of all the tools,
  - By keeping up similar time limits for all events in the experimental and control groups.
  - No time gaps were allowed for data collection in experimental and control groups. Simultaneous occurrence of events was ensured.

To ensure constancy across conditions, similar sequence and conditions were followed to administer pre-tests, instructions and post-tests in similar conditions of classroom environment and instructions. The experimenter herself administered the Bavelund’s Transactional Model of Communication. However, for the control group where Conventional Group of Learning (CGL) was followed, the experimenter along with the teachers concerned did pre-testing and post-testing and guidelines were given to them for instructions beforehand. So, that the conduction of the experiment was totally matched by the time period and schedule of control group. This was done to avoid contamination also.

**PROCEDURE**

Procedure of the experiment comprised of two main stages, which were:
- Selecting the sample.
- Conducting the experiment.

**Stage I  Selecting the sample**

The sample was selected at two levels: The School Level and the Student Level. Four schools with 336 students were selected for conducting the experiment. The procedures adopted for the selection of sample have already been discussed under the heading Sample.

**Stage II  Conducting the experiment**

The experiment was conducted in five phases as stated below:

- Phase I: Administration of the Entry Behaviour Test.
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- Phase II: Administration of the Pre-test, Criterion Test and tools for Life Skills.
- Phase III: Implementing the instructional programme: Implementing the Bamlund’s Transactional Model of Communication (BTMC).
- Phase IV: Administration of the Post-tests: A Criterion Post-Test and Post-tests of Life Skills tools.
- Phase V: Scoring, tabulation and analyses of data.

Phase I: Administration of the Entry Behaviour Test.

Before implementing the Bamlund’s Transactional Model of Communication (BTMC) to the experimental group, all the 336 students were given an Entry Behaviour Test (EBT). Scores of this test were used to determine whether or not the students had adequate entry behaviour required for the instructional treatment. The investigator provided full cooperation to the students who did not fulfill the condition of Entry Behaviour, as the subject of the Economics was new to them. An orientation was provided to all the students by the investigator to bring students at par with respect to their entry behaviour status.

Phase II: Administration of the Pre-test, Criterion Test and tools for Life Skills.

In this phase, all the students of both the groups were given Pre-test, the Criterion Test (Summative Test). The required time was provided to complete the tests. Scoring was done to obtain the information regarding pre-treatment knowledge of the students on the selected content. During this phase, Life Skills questionnaires were administered to all the students of the total sample. The students were given required time to record their responses. The response sheets were collected after each student had filled it up. The investigator herself monitored this process. The response sheets were scored according to the prescribed scoring keys.

The sixth tool, the questionnaire of Revised Two-Factor Study Process for Learning Approaches was administered to students to identify the students with Deep and Surface learning approach. The scores arrived at, after scoring against prescribed keys, were used and students were categorized according to their Learning Approaches at the initial step of the descriptive analysis of the data. The schedule of pre-testing is contained in Table 3.5.
Table 3.5.
School-wise Date Schedule for Test Administration for the Pre-testing of the Students

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the School</th>
<th>Pre-testing Schedule</th>
<th>Pretesting Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EB Test</td>
<td>Pre-test LA</td>
</tr>
</tbody>
</table>

Where

EB = Entry Behaviour
LA = Learning Approaches
LS = Life Skills

Phase III: Implementing the instructional programme: Implementing the Barnlund’s Transactional Model of Communication (BTMC)

The experimental group learnt through Barnlund’s Transactional Model of Communication (BTMC) and control group was taught through Conventional Group Learning (CGL). 10 Instructional Units based on BTMC Instructional Packages prepared and validated by the investigator (as explained in Chapter II) were used for experimental group. So instructional treatment was imparted to 163 students who were further classified for the purpose of descriptive analysis of the data on the basis of their learning approaches at the later stage.
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The instructional strategy based on the BTMC was administered according to the following plan:

➢ **STEP I**: Students were *motivated to communicate their ideas and feelings*. In this step, the investigator ensured that the students would learn best when they receive proper attention and care from her. The best way was to motivate them for appropriate verbal responses, which reinforce their performance level to the desired behaviour of learning. This step was followed so that the students should have the basic skills necessary for the correct encoding and decoding of their messages.

➢ **STEP II**: Students were *initiated to communicate through supporting / briefing/ contradicting the statements* made by the investigator. The assumption underlying here was that if students know what is to be done, they can better assess their own ability to communicate it and can judge the likelihood that they will be able to communicate it through supporting / briefing / contradicting the statements made by the investigator. For example, the classroom meeting was a time when students and investigator joined, in an open-ended, non-judgemental discussion on academic or current issues of Economics. In this open-ended meeting, students discussed thought provoking questions related to the concerned subject matter. When the experiment was going on, students frequently initiated the discussion by eagerly sharing something they read, saw or observed. There were number of examples of the students of experimental group who responded to the questions of the investigator with an interest in the subject, which led to a discussion on the matter very interestingly. To quote some:

- *Can we say that clothes are directly manufactured from villages? (Lesson II)*
- *How will you sort out that the three sectors of an economy are interdependent? (Lesson II)*
- *Is the vice-versa case existing in the above case? (Lesson II)*
- *What do the crops need the most to grow? (Lesson III)*
- *There is one very basic thing without the help of which crops will not grow. (Lesson III).*

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- How do you think population is a concern for any country? (Lesson IV).
- How we can come to know that shopkeepers cheat us? (Lesson X).

➢ **STEP III:** The investigator ensured *proper decoding and encoding of messages.*

Here the investigator found rapidly the success of attempted decoding and encoding of messages. It was assumed that the closer the approximation of the desired outcome, the greater would be the understanding of the content matter. For example, when *expressing feelings and thoughts* the following things were considered by the investigator:

- Be clear about what is to be expressed.
- Giving a specific description of the feeling, thought or message.
- Specifying about the degree to which feelings, thoughts or particular emotions felt.
- In case of mixed feelings, then expressing each feeling and explaining what each feeling means to the investigator.
- Using *I feel statements* for those situations that are clear and simple.
- Expressing oneself (investigator) without the buildup of negative feelings in the students while talking or interacting with students, that is, by not using attacking language or by hurting their self-esteem.
- Using *I believe/think/suggest* for those situations that were more complex to clarify the selected messages.

While *listening effectively,* the investigator considered the following things:

- Focus on the speaker and listening actively.
- Avoiding competing for response time.
- Avoiding formulating and listening to one’s own rebuttal while the speaker was talking.
- Avoiding to make evaluations and judgements about the speaker or their messages being communicated by them.
- Asking for a clarification when the messages sent by students were not understood.

➢ **STEP IV:** *Non-verbal behaviour of investigator was supportive to transactional process of communication.* Movements and gestures by the
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hands, arms, legs and other parts of the body and face are the most pervasive types of non-verbal messages and the most difficult to control. Even then the investigator tried her best so that non-verbal behaviour could serve as supportive element to transactional process of communication. This was done by avoiding the non-verbal body language that contradict messages-for example, smiling when irritated. The investigator ignored non-verbal cues that show aggressive style, like:
- Pointing, shaking fingers.
- Frowning.
- Squinting eyes critically.
- Glaring.
- Staring.
- Rigid posture.
- Critical, loud, yelling tone of voice.
- Fast, clipped speech.

Non-verbal cues which show assertive style of communication, like:
- Open, natural gestures.
- Attentive, interested facial expression.
- Direct eye contact.
- Confident and relaxed posture.
- Vocal volume appropriate, expressive.
- Varied rate of speech.

The investigator used this assertive style at certain times such as
- When a decision has to be made quickly.
- During emergencies.
- When it was known to the investigator that she was right while making any statement and that the fact was critical.
- Stimulating discussion for better communication among students.

➤ **STEP V:** *Communication process was explored with the supporting enrichment material.* The supporting enrichment material was used wherever required to explore the transactionality in communication behaviour (see Appendix A-3). For example:
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- In Lesson II, a chart showing different sectors of an economy was used, along with the flow chart, which reflects the inter-dependency between the sectors.
- In Lesson III, not only the charts were shown to reflect the data related with irrigation in India but maps were also effectively used.
- Wherever the data was required in the lessons, the same were appropriately shown to students (Lessons III, IV, VI, VII, VIII, & IX).
- Other lessons, which used maps, were concerned with Three sectors of an Economy, Irrigation in India, Population, Human Development etc. (Lessons II, III, V & IX).
- Lesson Plan X, which was based on Consumer Exploitation, used real life articles for demonstration purpose.

STEP VI: Each lesson based on the Barnlund’s Transactional Model of Communication has been fully described and given in Appendix A-2. The basic structure of lesson content remained the same for all the ten lessons. However, slight modifications were made wherever required. For example, lessons based on Economic Activities, Irrigation in India, Features of Indian Economy, Population were of those type where the students get involved themselves spontaneously in the transactional process of communication as the topics were of easy nature. But, some of the lessons like Three Sectors of an Economy, Price Rise, Economic Development, Human Development were of typical type where concept clarification was first of all sought out by the investigator before initiating the discussion in the classroom. Because of transactional nature of communication, students might not always be aware of the immediate learning experiences that they were having. Thus, the investigator played an important role in raising students’ consciousness about the concepts and principles by underpinning the messages and their encoding – decoding procedures. During the lessons, the investigator presented, explained and discussed the topic to be explored and participated to obtain the feedback from students simultaneously. Misconceptions were also clarified along with positive stimulation.
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➤ **STEP VII:** The *enrichment material* was employed throughout the 10 units for the treatment group. For the description of this step refer Appendix A-3.

➤ **STEP VIII:** *Unit-wise criterion tests were administered* at the end of each unit. Ten unit-wise criterion tests administered at the end of each unit (refer Appendix A-4). This was done to get the feedback from the students and for remedial measures.

➤ **STEP IX:** Remedial prescription was used via more appropriate selected messages, which were decoded properly for student’s clarification. This step involved the *individual attention paid to the students who lacked the proper mechanism of decoding and encoding process in the classroom.*

➤ **STEP X:** The investigator herself, taught the group following the guidelines developed in the lessons earlier (These have been discussed in detail in Chapter II).

➤ **STEP XI:** The sequence of all the steps for the BTMC strategy was almost the same for all the ten lessons. However, necessary variation was done where the lesson / content had any demand for that.

➤ **STEP XII:** A *Summative Test* was administered at the end of ten instruction units (see Appendix A-5).

The instructional strategy based on the Conventional Group of Learning (CGL) was administered according to the following plan:

➤ **STEP I:** This group was taught by their Social Studies (Economics) teachers in the conventional manner. It generally refers to reading out the content by the students or some explanations by the teachers and providing notes on certain important questions.
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- **STEP II:** Objectives and content of ten lessons were provided to the teachers of the control group.

- **STEP III:** No unit criterion test was conducted after the completion of each unit.

- **STEP IV:** The time schedule followed for this group was similar to that of the other experimental group.

The time schedule implementing the instructional strategy of BTMC along with conventional instruction in the control group has been given in the Table 3.6.
## Table 3.6
Date-wise Schedule for Implementing BTMC Instructional Strategy

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the School</th>
<th>Control Groups:</th>
<th>Experimental Groups:</th>
<th>Achievement Pre-test (Criterion)</th>
<th>Achievement Post-test (Criterion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit</td>
<td>LS Pre-Test</td>
<td>LS Post-Test</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>II</td>
<td>30th Oct., 2004</td>
<td>30th Nov., 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>29th Nov., 2004</td>
<td>30th Nov., 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IV</td>
<td>30th Nov., 2004</td>
<td>30th Nov., 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V</td>
<td>1st Dec., 2004</td>
<td>2nd Dec., 2004</td>
</tr>
<tr>
<td>2.</td>
<td>Government Model Senior Secondary School, Sec-20, Chandigarh</td>
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<tr>
<td>3.</td>
<td>Government Model Senior Secondary School, Sec-19, Chandigarh</td>
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</tbody>
</table>
Phase IV: Administration of the Post-tests: A Criterion Post-Test and Skills tools.

After completion of all the ten lesson units, the criterion post-test was administered to all the students of the experimental and control sheets were scored and analyzed. Similarly, Life Skills questionnaire was used to analyze the gain scores on Life Skills of both the groups.

Phase V: Scoring, tabulation and analyses of data.

All the tools were scored according to their prescribed scoring key thus obtained were subjected to statistical analyses.

STATISTICAL TECHNIQUES

The following statistical techniques were used to test the various hypotheses on the objectives of the study: -

- Mean and Standard Deviations were used whenever required.
- Graphical presentations: Bar diagrams, Line Graphs, Frequency drawn.
- Two – way ANOVA on gain scores of
  - Skill of Acquiring Knowledge (Achievement)
  - Skill of Critical Thinking
  - Skill of Decision Making
  - Communication Skill

Significant F- ratios were followed by T-test wherever required.
The detailed results and discussions are presented in Chapter IV.