CHAPTER 2

METHOD OF PROCEDURE

The method of procedure adopted for the investigation has been presented in this Chapter. The present investigation was quasi experimental design without controlled group. It aimed at developing and studying the relative, as well as, independent effectiveness of the two selected strategies namely live and videoed Bhavai as motivational programme and Exhibition cum Demonstration as educational programme for promotion of Solar Cooker.

The selected strategies were experimented on boys and girls of 9th and 11th standard from urban and rural schools of Baroda Taluka. Their effect was studied in relation to the selected variables. The study was carried out in the academic year 1990-91. The investigator participated in both the experimental conditions. The methodology adopted is reported in this chapter in two main sections with sub sections namely:

2.1 Method of selecting and developing communication strategies.

2.2 Method of study.

2.1 Method of selecting and developing communication strategies.

2.1.1 Selection of Bhavai as motivational programme

2.1.2 Selection of Exhibition cum Demonstration as educatiional programme

2.1.2.1 Identification of Concepts and Generalizations.

2.1.2.2 Formation of objectives based on selected content.

2.1.2.3 Selection of Media class to fullfill objectives.

2.1.2.4 Exhibition cum Demonstration as educational programme.

2.1.2.5 Communication strategies evolved for motivational and educational programme.

2.1.2.6 Writing and validating the Educational Script for Exhibition cum Demonstration.

2.1.2.7 Selection and Development of visuals for Live as well as videoed Exhibition cum Demonstration.

2.1.2.8 Significance of the selected Instructional Media and Instructional Aids for Educational programme.

2.1.2.9 Video Production of the Educational Programme.

2.2 Method of Study

2.2.1 Method of selection and development of Research Tools.

2.2.1.1 Desai Bhatt Group Intelligence Test.

2.2.1.2 Motivational Scale.

2.2.1.3 Knowledge Test.

2.2.2 Experimentation.

2.2.2.1 Administration of the Group Intelligence Test.

2.2.2.2 Administration of the Pretest on Motivation Scale.

2.2.2.3 Exposure to Live or Videoed Bhavai.

2.2.2.4 Administration of the Posttest on Motivational Scale.

2.2.2.5 Administration of the Pretest on Knowledge Test.

2.2.2.6 Exposure to Live or Videoed Exhibition cum Demonstration.

2.2.2.7 Administration of the Posttest on Knowledge.

2.2.3 Scoring of Research Tools.

2.2.3.1 Desai Bhatt Group Intelligence Test.

2.2.3.2 Motivational Scale.

2.2.3.3 Knowledge Test.

2.2.4 Selection of Final Sample on the basis of their presence during the seven experimental conditions for analysis of data.

2.2.5 Factorial Design.

2.2.6 Statistical Analysis.

2.1 Method of Selecting and Developing Communication Strategies

2.1.1 SELECTION OF BHAVAI AS MOTIVATIONAL PROGRAMME

Orienting the learner to the content prior to imparting the knowledge is considered to be an important step in teaching learning process. Several orientation activities have emerged during the past few decades.

Gagne (1985) provided orientation to instruction by informing learners of lesson expectations. Advance organisation (Ausubel, 1968) was advocated as another type of lesson orientation which helped to activate the cognitive structures

of individual learners. Ausubel's ideas of advance organisa--tion came from his view that learning and retention of unfamiliar but meaningful verbal material could be facilitated by advance introduction of subsuming concepts. In fact, proponents of advance organizers suggest that they provide a vehicle through which new information can be subsumed meaning--fully within individual cognitive structure. Ausubel advocated inclusion of introduction that is maximally relevant, clear and appropriate for learning that would follow it.

The principal function of the organizer is to bridge the gap between what the learner already knows and what he needs to know before he successfully learns the task at hand. In order to learn the unknown task learner needs certain media which he is familiar with and have some context with his day to day life.

In this context, its worth quoting an experiment conducted by UNICEF on health in several villages of Uttar Pradesh, Bihar and Madhya Pradesh in the year 1985. These experiments lead to the conviction that effectiveness of a health programme depended mainly on the cultural context and the mode of communication used for promoting it. UNICEF experimented with several traditional media forms for spreading the health messages. Health messages were woven into different forms of traditional media like folk drama, street plays and

puppet plays - all of which proved to be successful, although little costly in terms of money and talent. However, their final experiment in the village Gola near Lucknow proved to be the most successful. This experiment was entirely community based - developed in the villages own natural unadulterated style and along the lines of community itself with which it could easily identify (Sandal, V. 1989).

These traditional media formats can be used by the Audio Visuals with equal success. As proved, in the above mentioned experiment messages given through both media can be both accomodating and change producing as these media reflect social values and social behaviour which are considered acceptable by the society. They are also flexible, and adoptive. Hence folk media can establish a close rapport with the audience.

In order to use the traditional media format in the audio visual media what is required is area specific programmes based on the problems and needs of different sections of the population, using local talents, customs and practices and combining education with entertainment. In this context it was felt by the investigator that folk media could be used to motivate the people before imparting the knowledge regarding Solar Cooker to the selected sample.

Popularity of the type of folk media differs from region to region. One such folk media of Gujarat is Bhavai. Bhavai

is colourful and vigorous form of folk theatre, native to North Gujarat. For centuries, Bhavai - Gujarat's traditional folk theatre - has been the main source of education and entertainment for the village masses. In Bhavai the characters, namely the Rangalo, the Rangli and the Vidushak, are the practitioners of the art form which help knit together the social and cultural life of the people of Gujarat.

Bhavai originated about 700 or 800 years ago in North Gujarat. Asaitha, a medieval Bhavai poet is credited with the composition of 360 Bhavai Veshas. It is clear from his work that the poet projected society and culture with force. He not only started social revolution through Bhavai but he also created solutions to the problems faced by people at that time.

Today the society is changing very fast. The change generates advanced information and advance information sets pace for further development. One of the pressing problems in the developmental programme is energy consumption in the domestic sector. Due to scarcity of the traditional fuel the household sectors are facing problem of availability of cooking fuel. In order to overcome this problem one needs to educate the society about conservation of the fuel as well as using renewable and alternative energy sources for cooking the food. Before imparting the education or creating awareness regarding such sources of energy, understanding about the facts related to the topic, people need to be oriented to the problems along with the probable solutions to these problems.

Through the centuries, the Bhavaiyas have played the role of social reformers, entertainers and educationists. "In the medieval period, Bhavai played the role of an open unviersity to educate the masses along with the entertainment. It helped in enriching the general knowledge of the people."

Parker Brian (1989)

Bhavai is basically a rural form of folk art, which is informative, inspirative and entertaining at the same time. With the fusion of elements of dance drama with folk touch a specific theme is developed to bring about an awareness and popularization covering the various facts of theme - subject which is the main focal point of a Bhavai form.

In the Bhavai "Surya Mitra No Vesh" presented herein one can see educative, entertaining and inspirating elements. The message is put across with ease, with spectators getting engrossed while enjoying the Bhavai.

The main objective of this Bhavai was to motivate the students to study about use of Solar Cooker in day to day life. Threfore, Bhavai as folk drama was selected by the investigator as a motivational programme, prior to the exposre to the selected educational programme on Solar Cooker.

The expermental groups were exposed to videoed Bhavai entitled "Surya Mitra No Vesh" developed by Parlikar and Pandya in 1987 under DNES project sponsored by Ministry of Energy,

Government of India. The videoed Bhavai so developed was previewed for studying its use for motivational purpose by experts from Performing Arts Faculty as well as Mass Communication experts from Gujarat Energy Development Agency. Teachers from the selected schools previewed it for judging correctness of Information and use of the video film on Bhavai in motivating the students.

2.1.2 SELECTION OF EXHIBITION CUM DEMONSTRATION AS EDUCATIONAL PROGRAMME

2.1.2.1 Identification of Concepts and Generalizations. An analysis of the subject matter content pertaining to selected topic in the prescribed syllabus of 9th and 11th standard was done by the investigator. It revealed that only some of the lessons in science, particularly environmental education, were dealing with energy education in 1989-90. The portion included in the science course on energy education covered only part of energy aspects. No separate course/content was offered at secondary or higher secondary level on fuels for cooking and their efficiency, efficiency of the devices using conventional fuels, solar energy as alternate source of energy and and Solar Cooker as technical cooking device. The experience of the investigator on energy projects was utilised in selecting as

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*Parlikar, K.R. and Pandya, M.S. "Surya Mitra No Vesh", a video film sponsored by Department of Non-Conventional Energy Sources, Ministry of Energy, Government of India, New Delhi under the project developing communication strategies for promotion of conventional and non-conventional fuel at Department of Home Science Education and Extension, 1987.

well as developing concepts and generalizations pertaining to use of solar energy in cooking.

Thus, the first step of the investigator was to select concepts and generalizations leading to the selection of content on fuels used for cooking and its efficiency, efficiency of the devices using conventional fuels and use of solar energy as an alternate source of energy for cooking. The motivational and educational programmes were then to be selected on the basis of these concepts and generalizations. Appropriate objectives were formed for covering the content based on selected concepts and generalizations, "Environmental Education" course prescribed for students from urban and rural schools. The aspects on Energy Education covered in this study were :

* Conventional fuels and devices using conventional fuels.
* Solar Energy and its use in cooking.
* Solar Cooker.

Under each of these broad areas following concepts and generalizations were selected on the basis of the opinions of experts.

Selected Concepts and Generalizations

1. There are different types of fuels and cook stoves in use.

2. Conventional fuels and cookstoves are the part of energy education.

3. The efficiency of fuels and cookstoves varies in terms of wastage of energy due to its design.

4. There are wrong practices due to which the fuel is wasted.

5. Solar energy is one of the important non-conventional fuels.

6. Solar energy is harnessed for cooking through Solar Cooker.

7. There are different types of Solar Cookers with several advantages.

8. Solar Cooker can be used effectively and efficiently for cooking.

9. Solar Cooker is made up of different parts, which play vital role in the the process of cooking.

10. There is a specific procedure involved in operating Solar Cooker.

11. Various receipies can be cooked in the Solar Cooker and each recipi requires specific time for cooking.

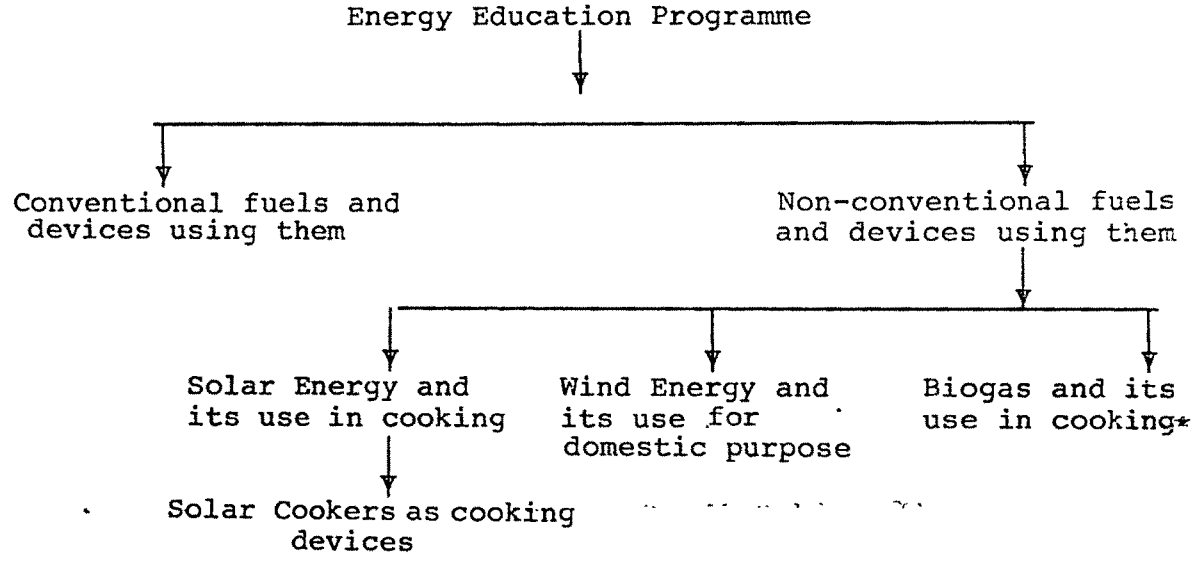
Arranging Content in Order

The concepts and generalizations leading to formation of content for learning purpose need to be organised logically. Here, the investigator had organised the content keeping in mind

the Blooms taxonomy which categorises human behaviour in cognitive, affective and psychomotor domain. For an orderly presentation of content the matter should be presented from known to unknown as well as simple to complex - the maxims stated by Taba 1962. Such presentation would facilitate progressive learning of selected concepts and generalizations.

The specific concepts and generalizations were also selected keeping in mnd their suitability for presentation through the selected strategies, as well as, their importance in energy education. The educational script and evaluative measures were developed keeping in mind selected concepts and generalizations.

The following flow chart indicates the organisation of content included in the present study.



[* Biogas and Wind Energy were not selected by the investigator for present study]

Content Validity

The concepts and generalizations leading to content were selected from the textbooks, reference books and materials produced by eminent scientists in the field of energy and fuels. The content validation was done by the energy experts and school teachers. This was done in order to judge adequacy, suitability and organisation of the concepts and generalizations according to the level of study of the students for preparation of selected educational programme.

2.1.2.2 Table 2 . Formation of Objectives Based on Selected Contents

Following objectives were framed by the investigator for teaching the selected contents :

Objectives	Domain	Level
To identify different types of fuels and conventional cook stoves used for cooking.	Cognitive	Knowledge
To understand the efficiency of the fuels and the conventional cook stoves.	Cognitive	Comprehension
To understand the reasons due to which the fuel is wasted.	Cognitive	Comprehension
To know the importance of solar energy for various reasons.	Cognitive	Knowledge
To understand the different parts of Solar Cooker	Cognitive	Comprehension
To know the different types of Solar Cooker.	Cognitive	Knowledge

Table Contd.

Objectives	Domain	Level
To understand the functioning of Solar Cooker.	Cognitive	Comprehension
To understand the points to be kept in mind while using Solar Cooker.	Cognitive	Comprehension
To know the advantages of Solar Cooker.	Cognitive	Knowledge
To know about the recepies which can be cooked in Solar Cooker.	Cognitive	Knowledge

It is obvious from the above taxonomical classification of the objectives for the promotion of the selected content on Solar Cooker that majority of the objectives fell under the cognitive domain at comprehension and knowledge level.

2.1.2.3 Table 3. *Selection of Media Class to Fullfill the Objectives

Media Class		Instructional Media	Instructional Aids
II	Printed Material	Programmed Texts	Charts,Graphs,Maps etc. used by Instructor
VII	Audio Visual Motion	Motion film video	---
VIII	Physical Objects	Actual objects. Mock ups or models of the real things	Actual objects. Mock ups or Models of the real things.

*Selection of the Media Class II printed Material, VII Audio Visual Motion and VIII Physical Objects, was done from the Media Selection Chart. (Anderson, 1976, Pp.16-29).

Based on the Anderson's models of selecting the media according to the listed objectives in order to achieve the goal of effective learning the investigator opted for two communication strategies. These two strategies were live and videoed strategies for imparting knowledge on the selected content through graphic aids and objects. As the selected content was to be presented in a sequence from 'simple to complex' and 'general to specific' the investigator thought of selecting Exhibition cum Demonstration as an educational programme.

2.1.2.4 Exhibition cum Demonstration as Educational Programme. Exhibition is a systematic display of models, specimens, charts, information, posters etc. in a sequence so as to be significant in teaching or creating interest in the participating members. Exhibition is one of the educational programme which can be arranged by educators. An exhibition can show actual objects, practices, result of demonstrations, programmes in process through different graphic aids.

In an exhibition the attention focuses on a group of materials that has been assembled according to plan. The exhibition is the product of a deliberate planning under controlled conditions. It is a 'manmade' affair.

Demonstration is a means of presenting material visually and audibly to a selected group of people. The average person is a much more impressed by "seeing than by hearing" but if these

two are interestingly combined, the presentation makes a more lasting impression and creates a desire. The creation of a desire resulting in action along some line is the ultimate goal of any demonstration. The purpose of the demonstration is promotional, educational or frequently a combination of both.

(AllGood, 1965, P.1)

The investigator selected Exhibition cum Demonstration for promotion of Solar Cooker in the present study.

The purpose behind selecting the combination of Exhibition cum Demonstration was to educate the students regarding the basic concepts and generalization as well as create awareness about the Solar Cooker.

2.1.2.5 Table 4 . Communication Strategies Evolved for Motivational and Educational Programme

The following strategies were selected by the investi--gator to motivate and educate the selected sample for promotion of Solar Cooker.

Live Strategy	Videoed Strategy
Bhava as Motivational Programme	Bhavai as Motivational Programme
Exhibition cum Demonstration as Educational Programme	Exhibition cum Demonstration as Educational Programme

2.1.2.6 Writing and Validation of the educational Script for Exhibition cum Demonstration. An educational script on Exhibition cum Demonstration for live, as well as, videoed strategies was written keeping in mind the selected content. The target group was kept in mind while developng the script. The educational script was made to instruct the students about the different types of fuels in use, efficiency of the fuels as well as cookstoves in use, use of solar energy for cooking, and Solar Cooker. The instructional approach was used in writing the educational script.

The script was written in Gujarati for both the selected strategies namely live and videoed Exhibition cum Demonstration as educational programme. The script was checked for content validity by subject matter experts from Gujarat Energy Development Agency and schools, for language clarity and compre-hensibility by experts in Gujarati, and for format and dramatic appeal by professional and experienced script writer.

The main features of the Live and Videoed Educational script were :-

* The commentary/visuals of the educational programme.
* Visuals used in live as well as videoed educational programme.
* Length of the shots and Exhibits used in the educational programme.
* Time required for each shot.

2.1.2.7 Selection and Development of the Visuals for Live as well as Videoed Exhibition cum Demonstration. The selection of the visuals for the presentation of content through live and videoed exhibits were done in consultation with guidance from experts. As suggested by experts different graphic aids such as charts, flash cards, mobile, model, flannel strips and table top displays etc. were selected for Exhibition cum Demonstration. As the T.V. format ratio is 3:4. The art work was developed keeping in mind this ratio. The art work developed was without the margin to make the photographic adjustments on the T.V. The charts, flash cards and flannel strips developed were in horizontal format. Each graphic was made of 7 to 8 lines with not more than 5 to 7 words per line. The visuals were prepared by the Artist.

2.1.2.8 Significance of the Selected Instructional Media and Instructional Aids for Educational Programme.

Media Class II Printed Material

"Printed Materials usually means such professionally produced publications as books, magazines and manuals. There are however a number of other materials that can be called printed materials such as photocopy and offset reproduction, easel sheets and protographic prints, which often can be produced in-house. These items are widely used in the field of education and training."

(Anderson, 1976, p.109)

Printed Materials can be used according to the level of objectives. They can be used for -

* The presentation of the factual information, recognition and discrimination of relevant stimuli.
* The presentation of vocabulary used in the explanation of situations, locations and position that the learner will face in the real life.
* Printed material facilitates learner to learn at their own pace, reading ability and entering level skills. The students and teachers can easily review the lesson material which can be produced economically and can be displayed either in colour or black and white. The material produced can be used either as instructional aid or an instructional medium with an added facility of movability from one location to the other.
* The selected instructional aids under media class were mobiles, charts, flash cards, flannel strips and table top displays which were used in developing materials for Exhibition cum Demonstration.

Media Class VII Audio Visual Motion

The communication through video technology may bring about radical change in the approaches, awareness, understanding and acceptance of the newly produced technology.

Video was selected as an Instructional medium under the media class audio-visual motion. Video tape has come up as a new technology to store audio-visual images on magnetic tapes.

It is very convenient to prepare video film on the various programmes since the entire process of developing films is eliminated. At present, 3/4" video tapes are used for broad-castng and 1/2" tapes for domestic and general use.

Video tapes offer an excellent medium for preparing programmes that can be broadcasted or can be multiplied and circulated for wider use.

Video tapes can be used according to the selected objectives.

* To teach recognition and/or discriminating of relevant motion stimuli such as relative speed of moving objects, deviations in movement and interaction of objects and things. It is also possible to display a series of relevant still visuals with or without audio stimuli.
* To teach rules and principles and series of words with other still visuals or prints.
* To provide immediate feedback to students concerning their performance, as they display their skills and their ability to apply rules and prnciples.

Video can produce the visual effects to enhance the learning process or entertainment value of presentation. It can also be reused number of times with different groups.

(Anderson, 1976, .p.72)

Media Class VIII. Physical Objects

The use of actual material or real life situation maximises the learning. It allows the student to learn the task in a highly stimulated conditions, minimizing the need to transfer learning from one environment to another.

The selected instructional medium and instructional aids under media class were the real objects namely Solar Cooker and the real life situation demonstrating procedure for using the Solar Cooker, depicted through Exhibition cum Demonstration programmes.

Use of Physical Objects in Exhibition

Physical objects can be used according to level of objectives, because -

- they help in teaching recognition and/or discrimination of the relevant stimuli.
- they demonstrate the sound, appearance and manipulation.
- they can teach principles, rules or sequential steps in operation of tool and can provide maximum realistic functioning.
- they allow the students to experience manipulative skills using their tactile sense.

2.1.2.9 Video Production of the Educational Programme. The following steps were taken in the production of video film on Exhibition cum Demonstration as educational programme.

Plan of Shooting

The steps below were followed n plannng the shooting.

* Selection of Video equipments.

The video equipments used by the videographer were -

- Video camera M 1000 and M 5 National.
- Two video cassette recorders VHS-180.
- Portable V.C.R.
- Adopter.
- Monitor.
- Tape Reocrder.
- Flash lights of 1000 Watt, with stand.
- Batteries.
- Battery Charger.
- Multiplicator Board with connectng wire.
- Audio Deck.

* Planning the Shooting.

- Indoor shooting for the graphics developed for Exhibition cum Demonstration.
- Outdoor shooting of the process involved in the use of Solar Cooker.
- Planning the sequence of the title shots.

* Actual Shooting.

- Arranging the graphic aids on the background material.
- Arranging the place for the demonstration of the use of Solar Cooker.

- Setting the tape recorder for the background musical effect in Exhibition cum Demonstration.

The shooting of the video film was done by the videographer according to the sequential order of presentation for convenience in terms of the editing work. The shooting for the graphic aids was taken from one angle and the close shots were taken for all the graphic aids. In the activity aids the shooting was done from two to three angles so as to select the best shot for the video film.

* Editing.

Editing was done by the videographer with the help of investigator. First, all the shots taken wer viewed by the investigator and the best shots were selected and transferred in sequence with the titles on the other cassette for development of a master print. After editing once again the video film was checked with the script to check the inclusion of all the shots as per plan. While editing, background music was added in the film.

2.2 Method of Study

2.2.1 METHODS OF SELECTION AND DEVELOPMENT OF RESEARCH TOOLS

2.2.1.1 Desai Bhatt Group Intelligence Test. The sample under study comprised of boys and girls of 9th and 11th standard from

urban and rural Gujarati medium schools of Baroda Taluka. It was therefore decided by the investigator to look for a standardised test, which is developed in Gujarati for arriving at the IQ score for group under study.

The Desai Bhatt Group Intelligence Test was used in the present study as it is developed for the students in adolescent stage. The test consists of 10 sample items and 100 test items. The items are in the objective forms and are scored on the basis of one to zero principles. The set of material provides for 'key' for evaluating response. The test was of 40 minutes. The test was given to the students along with the answer sheet.

2.2.1.2 Motivational Scale. Motivation has been a matter of great concern to parents, teachers and educators since the inception of education formal or otherwise. However, research and conceptual development concerning motivation began only in recent years. Motives relate to 'Why' of Human Behaviour. Psychologists look upon motives as conditions which arouse, regulate, and sustain behaviour. Their existance could only be inferred from behaviour which they influence. Human motivation can be aroused, intensified, sustained, directed and reinforced by the four basic kinds of motives namely,

1. Innate physiological drives including hunger, appetite, thirst, elimination, sex, rest, release from anxiety and other disturbing emotional states, escape from pain and equillibrium of various other homeostatic needs.

2. Innate psychological needs, perceptual, manipulatory and intellectual activities which find their highest satisfaction in culture guided exploration and creative self realisation of potentials.

3. Learned social motives, universal to the individual culture, including need for recognition by and the presence of other people, love and affection, approval and blame avoidance, security, mastery, self enhancement, ascendancy in competition and other satisfaction.

4. Learned individual interests, ideals and identifications.

(Frandsen, 1961. P.215)

Based on the above motives, motivational scale having thirty objective items was developed for assessing the motivation of sample under study, before and after ther exposure to the selected strategies. The major concern of the investi--gator here was to measure the motivation of the students prior to the exposure to the selected strategy and increase in the motivation of the students after exposure to the strategy. The purpose of this investigation was to study the relative as well as independent effectiveness of the two selected strategies namely live and videoed Bhavai in increasing the motivation of the students for promotion of Solar Cooker.

In the present investigation motivational scale was derived from item analysis of large pools of items based on

innate physiological, psychological needs, as well as learned social and individual interest. Items for this tools were developed based on the selected concepts and generalizations by reviewing the literature and motivational scales. Junior Index of Motivation was used as model for developing the motivational scale for present study. The tool was validated by experts with use of the parameter for judging the validity of the motivational scale. These parameters were students ability to discriminate, easy to administer for the students, relate them to real life situations. They were also requested to remove or improve irrelevant ambiguous or vague items. Based on their judgement 30 items were finally selected.

In the primary tryout the motivational scale required about twenty minutes for response before and after viewing the Bhavai. Reliability of the scale was measured by test-retest method. Reliability of the motivational scale ranged between .70 to .90 for the 9th and 11th standard students from urban and rural schools exposed to live and videoed strategies, which was found to be quite satisfactory.

2.2.1.3 Knowledge Test. Knowledge test when given, helps to judge the extent to which the behavioural objectives are attained. It further provides necessary feedback to the investigator for reappraisal of learning sequence under any educational programme. The investigator prepared the knowledge test involving recall and recognition items in Gujarati to test the knowledge of students under study.

The knowledge test developed was given to six experts to check content validity keeping in mind the objectives to be achieved and clarity of language. Two experts from Gujarat Energy Development Agency and two teachers each from secondary and higher secondary classes from urban and rural schools were selected to check validity of the knowledge test. The changes such as simplifying statements and breaking them into small items were incorporated in the final test.

The test was tried out on a small group of students to judge the effectiveness of the instructions for the test in general and also for each type of questions. On the basis of this tryout, certain modifications were incorporated and also the time limit was decided for the test. The test consisted of hundred marks. Types of test items and marks allotted were as per the following table.

Table 5 . Distribution of Test Items and Marks Allocation on Knowledge Test

Question No.	Test Items	Types of Items	Marks Alloted
Question: 1(A)	10 items of fill in the gaps type	Recognition	10 Marks
Question: 1(B)	10 short answers Items	Recall	20 Marks
Question: 2(A)	20 items of True and False type	Recognition	20 Marks
Question: 2(B)	10 multiple choice items	Recognition	20 Marks
Question: 3	3 short answers items	Recall	30 Marks

2.2.2 EXPERIMENTATION

In the present experiment two strategies namely Live and Videoed Bhavai for motivating and Exhibition cum Demons--tration for educating the students from four selected schools - two each from urban and rural areas of Baroda Taluka were used. In the experiment following steps were taken.

2.2.2.1 Administration of the Group Intelligence Test. Intelli--gence test was administered to both the experimental groups, 15 days prior to the experiment. The data on IQ test were collected classwise. The selected students were given the test during a class period of 45 minutes which was fixed before two weeks in all the schools. Necessary instructions were given before administering test as prescribed in the test itself. After explaining the 10 exercise items to the group, 40 minutes were given for the completion of test items.

2.2.2.2 Administration of the pretest on Motivational scale. Motivational scale was administered on the students before exposing them to the live or videoed Bhavai as motivational programme. The investigator gave explaination to the students regarding the scale and procedure for responding. The students were asked to write their names, roll numbers, name of the school, sex and class on the answer sheet before responding to the scale. They were then asked to respond to the item falling on the scale and return it to the investigator on completion immediately.

2.2.2.3 Exposure to Live or Videoed Bhavai. Soon after the pretest on motivational scale was over the experiment on Bhavai show was arranged by the investigator. The experiment was conducted to find out the relative, as well as, independent effectiveness of the selected strategies namely live and videoed Bhavai in increasing the motivation of the students through Bhavai as motivational programme.

Care was taken by the investigator that the treatment given for the presentation of cuplets, content and sequence were the same presented through the selected strategies under two experimental conditions. The students were exposed to this strategy for 35 minutes. The students selected for the videoed strategy were exposed classwise, whereas for the live strategy the selected students from 9th and 11th standard were exposed together.

2.2.2.4 Administration of the Posttest on Motivational Scale. After exposure to the experiment on the motivational programme through live and videoed strategies the students were given the same motivational scale to see the increase in their motivational level.

2.2.2.5 Administration of the Pretest on Knowledge test. The knowledge possessed by the selected students under live and videoed Exhibition cum Demonstration was tested using the knowledge test to range the extent of knowledge possessed by students on the selected content, before entering the experimental situation. The students were asked to write down their

name, name of the school, roll number, class of study and sex on the test paper. The students took 20 to 25 minutes to complete the pretest.

2.2.2.6 Exposure to Live or Videoed Exhibition cum Demonstration. Soon after the pretest was over, the experiment was conducted by the investigator. The experiment was conducted to find out the relative, as well as, independent effectiveness of the selected strategies namely live and videoed Exhibition cum Demonstration in increasing the knowledge of the students for the selected content.

Care was taken by the investigator that the treatment given for covering the different concepts and generalization was the same and same illustrations, diagrams and graphic aids were presented through the selected strategies under two experimental condtions. The same sequence of presentation was followed for the Exhibition cum Demonstration through both the selected strategies. The students were exposed to the strategies for 40 minutes. The students selected for the videoed strategy were exposed classwise, whereas for the live strategy the students were divided into batches of 15 students per batch and were allowed to see the exhibition.

After the exposure to exhibition, students were exposed to the procedure to cook the recepies in the Solar Cooker. The investigator had kept legumes, pulse and vegetable for cooking

in Solar Cooker before 2 hours. The students were made aware about it during the demonstration on use of Solar Cooker. The live demonstration on Solar Cooker was given classwise, in urban as well as rural schools.

2.2.2.7 Administration of the Posttest on Knowledge test. After exposure to the experiment on the educational programme through live and videoed strategies the students were given the same knowledge test to see the gain in knowledge.

2.2.3 SCORING OF THE RESEARCH TOOLS

2.2.3.1 Desai Bhatt Group Intelligence Test . The key was prepared and punched for ease of scoring. On completion of the scoring IQ scores for each of the students were arrived at, as per the manual of instructions provided along with the test materials. The IQ score for the students under study ranged between 70 to 140. The categorization of students on the basis of their scores was worked out with the expert guidance for the present study. The median scores of the IQ test of each group was worked out and the students under study were divided into the following categories.

* Students having the scores above median were considered as students with High Intelligence.
* Students having the scores below median were considered as students with Low Intelligence.

This categorization also had relevance to the factorial design.

2.2.3.2 Motivational Scale. There were thirty items on the motivational scale and all the items were stated positively. The students were supposed to respond to each statement according to their perception of level of agreement. Each statement had three response categories. Each respondent had to check any one of the three response categories which were alloted a value of 3,2,1 (Refer Appendix VII). The responses were then added according to the predefined categories. Total minimum overall possible score was 30 and maximum score was 90. The scores obtained ranged between 60 to 80 on pretest scores and 60 to 88 on posttest scores. The total scores obtained by the respondents were used for the final analysis.

2.2.3.3 Knowledge Test. After the administration of pretest and posttest, the answersheets were corrected and scores were recorded by the investigator. The scores obtained ranged between 14 to 88 on pretest and 24 to 92 on posttest scores. These scores were used for analysing the data.

2.2.4 SELECTION OF FINAL SAMPLE

The population of the study comprised of boys and girls from secondary and higher secondary classes of urban and rural schools, of Baroda Taluka during the year 1990-91. There were 52 urban and 9 rural schools having secondary and higher secondary classes. The feasibility study (Appendix II) was conducted which called for information such as open place for Bhavai show,

big Hall and big place for Exhibition cum Demonstration as well as availability of Television, video and electricity for conducting the experiment in the schools. The schools which were fullflling the requirements for the experiment were thus selected as below :

* Alembic Vidyalaya, Baroda urban.
* Jayshree Model, Baroda, urban.
* Shri Guru Jigaji Vidyamandir, Sokhada, rural.
* Gangabai Sarvajanik High School, Chhani, rural.

Although the investigator planned to include all the students from secondary and higher secondary classes those from 10th and 12 th standard had to be dropped owing to their hectic schedule and Board examination. Therefore, students from 9th and 11th standard were finally selected for the experiment.

The table below shows the number of absentees and the sample finally selected for the present study.

Table 6 . Distribution of the Sample According to the Selected Strategies

Strategies	Total Enrolment	No.of Absentees	Final Sample
Live Strategy	213	39.43 % (84)	60.56 % (129)
Videoed Strategy	220	33.18 % (73)	66.81 % (147)
TOTAL...	433	36.25 % (157)	63.74 % (276)

It is revealed from the above table that 433 students were enrolled in 9th and 11th standard in the selected urban and rural schools for the experiment. All the students enrolled in the selected schools were exposed to the selected strategies namely Live and Videoed motivational and educational programme.

From the total enrolled students 36.25 per cent (157) of the students were absent at some or the other stage while administration of the tool or experimentation. Therefore, 63.74 per cent (276) of the students who were present while admini--stration of tool and experimentation were finally selected as sample.

It further revealed that 213 students were enrolled in the schools selected for the Live strategy, from which 39.43 per cent of the students were absent, at some or the other stage while administration of the tool or experimentation. Therefore, 60.56 per cent (129) of the students who were present while administration of the tool and Live experimentation were finally selected as sample for live strategy.

In the schools selected for videoed strategy 220 students were enrolled and of which 33.18 per cent of the students were absent at some or the other stage while administration of tool or experimentation. Therefore, 66.81 per cent of the students who were present all throughout the experimentation were selected as final sample, for the videoed strategy, which was found slightly higher than the students exposed to lvie strategy.

This indicated that the students were interested in learning through videoed strategy.

2.2.5 FACTORIAL DESIGN

Whenever an investigator is interested in studying the effect of two or more variables simultaneously factorial design is employed. This type of design requries a minimum of two independent variables. If each independent variables have only two levels, then it is called 2 x 2 factorial design. The following independent variables which were included in the present study had two levels which were categorized as per the following :

1. Communication strategies	:	Live Strategy, Videoed Strategy
2. Place of habitation	:	Urban, Rural
3. Class of study	:	9th, 11th
4. Sex of the Respondents	:	Girls, Boys
5. Level of Intelligence	:	High Intelligence
		Low Intelligence

2.2.6 STATISTICAL ANALYSIS

The relative, as well as, independent effectiveness of selected strategies namely live and videoed Bhavai in terms of increase in motivational level and Exhibition cum Demonstration in terms of gain in knowledge was studied overall, as well as, in relation to the selected variables.

The followng statistical measures were used for the different purposes.

1. To report background information on the students percen--tages were calculated.

2. To find out the IQ level of the students under experi--mental situation key prepared by Desai-Bhatt Group Test was used after suitable modification in consultation with experts.

3. To study the motivational level and the gain in knowledge regarding Solar Cooker through the live and videoed strategy the mean values were calculated for overall, as well as, according to the selected variables for pretest and posttest.

4. To find out the significant difference in the mean scores of pretest and posttest regarding increase in overall motivational level and gain in knowledge regarding Solar Cooker, as well as, in relation to the selected variables the paired t test was used.

5. Analysis of covariance technique was applied to judge the efficiency of one communication strategy over the other. Analyss of covariance represents an extension of analysis of variance to allow for the correlation between initial and final scores. Analysis of covariance is specially useful to the researcher when for various reasons it is

impossible to equate groups on the criterion variable under study. Through covariance analysis, one is able to adjust the effect in terminal scores which will allow for differences in an initial scores.

The method used for statistical analysis helped the investigator to meet the objectives and check the research hypothesis leading to conclusion based on the findings regarding relative, as well as, independent effectiveness of the two selected communication strategies of the selected programmes for promotion of Solar Cooker according to the selected variables.