METHODS OF INVESTIGATION

The present research project was undertaken to study the effectiveness of the selected audio-visual aids in terms of gain and retention of knowledge, in selected homemaking practices under village conditions. 'Before and after' experimental research design was used for this study to measure the gain and retention of knowledge. This research design is also known as pretest-posttest design which is widely used in educational research. In this research design, the dependent variable is measured before the independent variable is applied or withdrawn and then the amount of change, if any, that has taken place is computed.¹ The factors, such as history, maturation and knowledge from other sources may affect the validity internal as well as external. In order to keep these factors under control, some efforts were made. The retention period was kept as fifteen days to prevent maturation on the part of subject. Further, other extension agencies were requested not to conduct any extension programmes related to the subject matter selected for the study. In order to further prevent pouring in of information remote villages were selected, which were not frequently visited by outsiders. In this way the factors affecting the validity were well taken care of.

Population and selection of sample

The present study was conducted in two selected Panchayat Samities of Udaipur district in the State of Rajasthan. Udaipur district situated in the southern part of the State of Rajasthan, comprises of 13 Panchayat Samities (Community Development Blocks), having 13 lakh population,\(^2\) out of which approximately more than two lakh families are engaged in agriculture. The female population of the district is also engaged in agricultural operations, such as sowing, intercultural operations, irrigation, harvesting and storage, and thus has become indispensable. It has, therefore, become necessary to teach this sect of population regarding the latest technical know-how in the field of agriculture and home science.

Udaipur district and the two Panchayat Samities, namely Girwa and Badgao, were purposely selected (Fig. 1) for the investigation because of the following reasons:

1. The College of Home Science and the Directorate of Extension Education, University of Udaipur, Udaipur have taken up a number of projects of rural development in the district of Udaipur and the two above named Panchayat Samities.

2. The investigator has worked for eight years in the rural areas of Udaipur district, and has intimate contacts with the farm families as well as the block staff who were helpful in securing cooperation for collection of reliable data.

3. Willingness on the part of the farmwomen of this area to become the subject for this study.

From these two selected Panchayat Samities, twenty villages were selected randomly for the purpose of the study. For this selection care was taken to eliminate those villages which are located close to the city, since the farmers of these villages very regularly visit the city for marketing their produce and purchasing the inputs. It has also been observed that people from these areas are in government service and, therefore, visit the city frequently. This was done to avoid impact of such visits which make them cosmopolitan in their outlook rather than localite. Moreover, it was done to avoid indirect influence on learning as well as on retention. With this, in view, these 20 villages were selected randomly from a list of isolated villages of these two Panchayat Samities. The list of all such villages from two selected Panchayat Samities was prepared in alphabetic order. Twenty villages then were randomly selected with the help of random tables prepared by Fisher and Yates. The list of villages selected for the study is presented in Table 1, and shown in map (Fig. 2).
SELECTED VILLAGES IN PANCHAYAT SAMITIES
BADGAON AND GIRWA
<table>
<thead>
<tr>
<th>Name of the villages selected</th>
<th>Audio-visual aid used</th>
<th>Test for initial knowledge</th>
<th>Test after exposure to aid for gain in knowledge</th>
<th>Test after 15 days of exposure to aid for retention of knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drying of vegetables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kavitha</td>
<td>Flipbook</td>
<td>10-6-75</td>
<td>10-6-75</td>
<td>25-6-75</td>
</tr>
<tr>
<td>Loyera</td>
<td>Slide</td>
<td>12-6-75</td>
<td>12-6-75</td>
<td>27-6-75</td>
</tr>
<tr>
<td>Thur</td>
<td>Radio</td>
<td>13-6-75</td>
<td>13-6-75</td>
<td>28-6-75</td>
</tr>
<tr>
<td>Madar</td>
<td>Kavad</td>
<td>14-6-75</td>
<td>14-6-75</td>
<td>29-6-75</td>
</tr>
<tr>
<td>Badi</td>
<td>Puppet</td>
<td>15-6-75</td>
<td>15-6-75</td>
<td>30-6-75</td>
</tr>
<tr>
<td>Debari</td>
<td>Flipbook</td>
<td>22-6-75</td>
<td>22-6-75</td>
<td>27-7-75</td>
</tr>
<tr>
<td>Nai</td>
<td>Kavad</td>
<td>24-6-75</td>
<td>24-6-75</td>
<td>25-7-75</td>
</tr>
<tr>
<td>Bhoya-ki-Pacholi</td>
<td>Radio</td>
<td>25-6-75</td>
<td>25-6-75</td>
<td>27-7-75</td>
</tr>
<tr>
<td>Lakarwas</td>
<td>Slide</td>
<td>5-7-75</td>
<td>5-7-75</td>
<td>20-7-75</td>
</tr>
<tr>
<td>Sakroda</td>
<td>Puppet</td>
<td>7-7-75</td>
<td>7-7-75</td>
<td>22-7-75</td>
</tr>
<tr>
<td><strong>Grain storage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mampura</td>
<td>Radio</td>
<td>16-6-75</td>
<td>16-6-75</td>
<td>1-7-75</td>
</tr>
<tr>
<td>Nagedia</td>
<td>Flipbook</td>
<td>17-6-75</td>
<td>17-6-75</td>
<td>2-7-75</td>
</tr>
<tr>
<td>Chirwa</td>
<td>Kavad</td>
<td>18-6-75</td>
<td>18-6-75</td>
<td>3-7-75</td>
</tr>
<tr>
<td>Bilota</td>
<td>Slide</td>
<td>19-6-75</td>
<td>19-6-75</td>
<td>4-7-75</td>
</tr>
<tr>
<td>Sabalpura</td>
<td>Puppet</td>
<td>21-6-75</td>
<td>21-6-75</td>
<td>6-7-75</td>
</tr>
<tr>
<td>Kundal</td>
<td>Flipbook</td>
<td>11-7-75</td>
<td>11-7-75</td>
<td>26-7-75</td>
</tr>
<tr>
<td>Guddli</td>
<td>Kavad</td>
<td>12-7-75</td>
<td>12-7-75</td>
<td>27-7-75</td>
</tr>
<tr>
<td>Tidi</td>
<td>Radio</td>
<td>13-7-75</td>
<td>13-7-75</td>
<td>28-7-75</td>
</tr>
<tr>
<td>Dholki pathi</td>
<td>Slide</td>
<td>14-7-75</td>
<td>14-7-75</td>
<td>29-7-75</td>
</tr>
<tr>
<td>Barapal</td>
<td>Puppet</td>
<td>20-7-75</td>
<td>20-7-75</td>
<td>5-8-75</td>
</tr>
</tbody>
</table>
The next step was to select a group of 30 farmwomen for each of the five selected aids used for the two home-making practices. For this purpose a list of all the farm families in each of the twenty villages was prepared with the help of Patwari. While making the list, care was also taken that only those farmwomen were included in the list who were following these two practices, as learning and retention is easy and more in familiar practices. Hence the population consisted of those farmwomen in the selected areas of survey in which they were already using the two practices, namely grain storage and drying of vegetables. Out of the list so prepared 20 to 25 farmwomen were selected from each village using the random number. These groups of selected farmwomen were administered the knowledge test specially prepared for this study. On the basis of scores obtained by the respondents, homogeneous groups of 15 farmwomen were taken from each village. To achieve this, homogeneity selected farmwomen were administered the knowledge test. On the basis of scores obtained within a range of 10 to 13 scores out of 50 scores in case of grain storage and 12 to 15 out of 55 scores in drying of vegetable practice, the homogeneous group was drawn. This constituted the final sample of 300 farmwomen which was used for the study.
Individuals differ with respect to their learning ability. Research studies have shown that personal characteristics, such as age and socio-economic status, affect the learning as well as retention. Most of the work has been done under the laboratory conditions in which school children are the subjects. Secondly, a number of studies have been done in the field of adoption where socio-economic status as an affecting factor has been studied, but the effect of socio-economic status on learning and retention which are the pre-requisites of adoption has not been studied. With a view to find out the effect of age and socio-economic status of people under field conditions the gain and retention of knowledge were studied.

Age: Three categories of age were framed for this study, viz. (i) 16 to 30 years - young, (ii) 31 to 45 years - middle, and (iii) above 45 years - old.

Socio-economic status: With a view to find out the socio-economic status of the respondents and to categorize them, efforts were made to use an appropriate, reliable and valid socio-economic status scale. The investigator studied the available scales, especially the following ones:

(1) Kuppuswamy, B.; (2) Kuppuswamy, B. and Srinivas, M.N.; (3) Lewis, O. and Dhillon, H.S.; (4) Rahadkar, W.B.; and (5) Udai Pareek and Trivedi, G. ³

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³ Udai Pareek and Trivedi, G. Manual of the socio-economic status scale (rural), Manasayan, Delhi.
In view of the objectives and the nature of the study it was felt that socio-economic status scale (rural) developed by Udai Pareek and Trivedi could best serve the purpose since the validity and reliability of this test is very high. The inventory of items included in this scale are given below, and also appear as part II of the interview schedule (Appendix I).

1. Caste
2. Occupation
3. Education
4. Social participation
5. Land
6. House
7. Farm power
8. Material possession
9. Family type and size

This scale was primarily standardized in the villages near Delhi, but was subsequently modified to make it suitable for use in other parts of the country. The scale consisted of nine main items which were found to be significant for indicating socio-economic status of rural family. The scale had the added advantage of simplicity in administering it. Further, care was taken to include those items on which quantitative information could be objectively collected.
After collecting the needed information about the rural family on nine different information categories and their scores, it is easy to calculate the total scores received by the person and to categorize him on the five point scale by putting him in category A, B, C, D or E. Originally the five categories suggested by Trivedi were:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Category</th>
<th>Scores on the scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Upper class</td>
<td>Above 43</td>
</tr>
<tr>
<td>B</td>
<td>Upper middle class</td>
<td>33 to 42</td>
</tr>
<tr>
<td>C</td>
<td>Middle class</td>
<td>24 to 32</td>
</tr>
<tr>
<td>D</td>
<td>Lower middle class</td>
<td>15 to 23</td>
</tr>
<tr>
<td>E</td>
<td>Lower class</td>
<td>Below 13</td>
</tr>
</tbody>
</table>

Instead of having these categories, B, C and D were combined together so as to have only the middle class category for the present study. Although the categories have been changed but the criteria for categorization was not changed. This change in categories was made from the viewpoint of convenience. These categories were as under:

<table>
<thead>
<tr>
<th>Category</th>
<th>Scores on the scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 High class</td>
<td>39 to 54</td>
</tr>
<tr>
<td>2 Middle class</td>
<td>23 to 38</td>
</tr>
<tr>
<td>3 Low class</td>
<td>Below 22</td>
</tr>
</tbody>
</table>
While conducting the interviews, information was collected from all the 300 homemakers with the help of this scale and then they were categorized in the three categories mentioned above.

**Selection of Homemaking Practices**

Relevant, useful and directly applicable subject matter significantly helps the learner to learn faster, and effectively and so also to retain the learnt subject matter for a longer period. This may be because of accelerated motivation and receptivity on the part of the learner. While selecting the subject matter for homemaking practices for the present study, care was taken to select those practices which were significant for the group under reference.

During eight years of field work, the investigator had ample opportunity to work with the people and know their needs. The investigator conducted a preliminary survey with the farmwomen to find out the two most important and significant areas in which they wanted improvements. As a result of this survey the two homemaking practices, i.e. grain storage and drying of vegetables, were found important by the farmwomen where they wanted to learn new improved methods. Discussions were also held with the extension personnel and it was concluded that the
more important and burning problems of the area were to save grain from damages by pests and provide nutrition to the people through vegetables round the year.

**Drying of Vegetables**

Vegetables constitute an important part of our diet as these provide essential nutrients like vitamins, minerals, protein and cellulose to the body. Unfortunately owing to several reasons, the consumption of vegetables is very low in our country as against the recommended allowances suggested by ICMR. The first reason is the nonavailability of vegetables round the year. Secondly, people do not consume vegetables because of high cost and existing superstitions. As a result of these, majority of our population, especially vulnerable group, suffer from many dietary deficiency diseases, especially of vitamin and mineral deficiency.

The alternative to fresh vegetable is dried vegetable. It is reported that during the process of dehydration the water or moisture content is reduced to such a level that bacteriological and chemical changes are prevented.


Prescott stated that dehydrated vegetables generally contain less than 10 per cent of water. Except moisture other nutrients, like vitamin A, vitamin B complex, minerals like iron and calcium, and proteins remain present in the dried vegetables. The only vitamin which is destroyed during drying is vitamin C or ascorbic acid. Thus these dried vegetables can very conveniently replace the fresh vegetables.

In the developed countries several mechanical methods are being employed for drying of vegetables, while in India and other developing countries only sun-drying is prevalent and feasible. Therefore, the improvement in the existing practices with the farm families can be very conveniently made. In view of the convenience and the prevalence of drying of vegetable among farm families this homemaking practice was selected to constitute the subject matter for this study.

Grain Storage

The second selected homemaking practice was grain storage. Its vital significance in our economy is obvious

as unsatisfactory storage practices are responsible for a loss of about 13 million tonnes of food grain every year which is almost twice the quantity imported during the recent years of scarcity. This loss due to grain infestation alone accounts for 10 per cent loss of the total produce\textsuperscript{7}. The nutritional quality of the food is also low. If this loss can be checked the food problem can be solved to a great extent. In order to check this loss the scientific and safe methods of grain storage should be introduced.

Under Indian conditions the farmwoman looks after the grain storage along with many other farm operations. A number of researchers\textsuperscript{8} have reported that larger participation of farmwoman is in storing the grain (77.7 per cent) against other operations, like transplanting, weeding, hoeing, etc. Since farmwoman is found to be involved in this practice and also this practice is prevalent among majority of people, it was decided to include this practice as subject matter for the present study. There is a need and urgency to teach the subject matter effectively to the farmwomen so that substantial losses may be prevented and in turn the food problem may be solved considerably.

\textsuperscript{7} Committee on losses of food grains. Op. cit.
There are several types of containers which are used for storing grains and so also the chemicals for food grain. For the purpose of this study the improved version of earthen pot has been used as 70 to 80 per cent of rural families in Udaipur district use earthen pot which is known as 'kothi'. And out of the different chemicals E.D.B. ampules and Celphos tablets have been used, as these are easy to be used, are easily available and are effective.

Knowledge Test

Bloom has categorized learning as cognitive, affective and psychomotor. These terms may be defined briefly as knowledge, values and manual skills. In order to measure the cognitive aspect of learning (the knowledge gained and the knowledge retained) in the present study a knowledge test was developed in two selected homemaking practices.

For developing the knowledge test, lot of discussions were made with subject matter specialists in the two areas, namely plant protection and foods and nutrition. Twelve

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major aspects were identified in the case of drying of vegetables and thirteen aspects regarding grain storage practice.

**Drying of vegetables:**

1. Types of vegetables to be dried
2. Reasons for drying the vegetables
3. Precautions during dehydration
4. Congenial conditions for drying
5. Changes which occur during dehydration
6. Selection of vegetables
7. Prepreparation
8. Blanching procedure
9. Timings for blanching
10. Advantages of blanching
11. Drying and storage of dried vegetables
12. Cooking of dried vegetables

**Grain storage practice:**

1. Name of insects
2. Congenial period for growth of insects
3. Reasons for grain infestation
4. Information regarding kothi
5. Maintenance of kothi
6. Storing grain
7. Use of fumigant
8. Name of fumigant
9. Physical properties of fumigant
10. Procedure for using fumigant
11. Dose of fumigant per quintal of grain
12. Time of opening the kothi after fumigation
13. Precautions
Each of these aspects was further divided into a number of questions to take care of the specific subject matter. A score was assigned to each correct alternative. Respondents knowing the correct answer scored one mark while others not knowing the subject matter obtained zero. A total of 55 scores were assigned for drying of vegetables and 50 scores for grain storage (Appendix I).

The knowledge test was constructed in English and translated in Hindi, and was pretested with 15 farmwomen not included in the sample to adjudge the applicability of the knowledge test for clarity of the language and coverage of subject matter. The suggestions were incorporated accordingly.

The knowledge test so developed was administered to the respondents three times. First it was administered to find out the existing knowledge of the respondent to establish the benchmark prior to exposure to the audio-visual aid. Then it was administered immediately after the exposure to the audio-visual aid to find out the immediate gain in knowledge. The difference in scores before and after the exposure indicated the gain in knowledge. Again the test was given for the third time after fifteen days of the exposure to find out the knowledge retained. The difference between scores obtained after 15 days and initial score was used to know the extent of subject matter retained.
Selection of Audio-Visual Aids

A large variety of teaching aids are available to the extension worker to do the teaching job under the field conditions. The first task for the investigator was to select a set of teaching aids which can effectively handle the subject matter under reference, easily available to the extension worker under field conditions, which are not very costly and are adaptable to the local conditions. With this objective in mind lot of study was made by the investigator to understand the characteristics, advantages and limitations and the procedure of preparing and handling the aids. After becoming familiar with the various aspects of teaching aids and in view of the subject matter under study it was decided to have a combination of modern as well as traditional aids and so also projected as well as non-projected teaching aids. Finally, the following teaching aids were selected to act as vehicle for the present study:

Modern : Radio
Traditional : Puppet
           : Kavad
Projected : Slide
Non-projected : Flipbook
Although the classification and selection are arbitrary yet a cross section of different types of aids were included to study the relative effectiveness.

Preparation and Use of Audio-Visual Aids

All the audio-visual aids were planned and prepared by the investigator with the help of experts. Only one audio-visual aid was exposed in two selected villages for each homemaking practice (Table 1). Thus two sets of each aid were prepared for the selected homemaking practices, e.g., two slide sets one for grain storage and another for drying of vegetables were developed. The outline for each practice was prepared after a thorough and extensive reading and discussions with the subject matter specialists. The basic scripts on subject matter were then finalized for developing the aids. Rural background was considered while organizing illustrations and captions for the aids.

On the basis of finalized scripts a stimulating verbal commentary in Hindi was written for each aid and was practised before presentation (Appendix II). Common words from the local dialect were incorporated in the commentary.
Pretesting of Audio-Visual Aids

All the prepared audio-visual aids were pretested with rural homemakers in order to find out the clarity in illustrations, language, sequence of the content and time taken for exposure of each aid. Suggestions were incorporated accordingly for final aid.

Slide: The 2" x 2" photographic coloured slide sets were developed for both the homemaking practices. The coloured Kodak films were used for developing the slides. The situation for each point was arranged and photograph was taken in the real village situations. A village woman was selected and was guided to perform various steps in both the homemaking practices. Each step was then picturized for making the slide. Efforts were made to make the slide sets as interesting and life like as possible by including the human beings and their actions. Drawings and diagrams were incorporated as and when required. In all, there were 21 slides for drying of vegetables and 28 slides for grain storage practices.

Exposure of the Aid: The slide show was arranged for the selected respondents in the village during night. Each slide was projected for a considerable time in proper sequence. Important point in each slide was emphasized in such a way that the respondent could remember the visual message more effectively.
A stimulating commentary in Hindi with natural flow was presented along with the exposure of each slide. The commentary was given in very effective voice so as to capture the attention of audience. A brief discussion was arranged after the exposure of the slides. The respondents then were interviewed immediately after the show was over, to find out the immediate gain in knowledge.

Radio: Out of the three popular modes of radio presentation, i.e., straight talk, dialogue and dramatic presentation, dialogue mode was selected as it is the most suitable and interesting way of presenting educational message to the rural masses11. The radio scripts in Hindi of 15 minutes duration for each homemaking practice was written and recorded at the All India Radio Station, Udaipur. One person from the staff of the Radio Station participated in the recording of dialogue.

Exposure of the Aid: On the scheduled day of broadcasting the investigator took a transistor set to the village. At the fixed time, the respondents listened to the talk carefully. The radio talks were also recorded on the tape recorder for using the same talk in the second village

on the scheduled day. A brief discussion was arranged after the talk. The respondents were interviewed immediately after the discussion.

**Flip Book:** The two flip books were prepared for both the homemaking practices. These flip books consisted of brief colourful visual messages on drawing sheets of convenient size (20" x 15"). These sheets were then arranged in logical order and bound on spiral cords. The flip book on 'drying of vegetable' contained 13 leaves, while 'grain storage practices' had 19 leaves.

**Exposure of the Aid:** The respondents were exposed to each sheet, accompanied by stimulating verbal commentary in proper sequence emphasizing the important points of improved homemaking practices in such a way that the respondent could remember the visual message more effectively. After the brief discussion the respondents were interviewed for assessing the gain in knowledge.

**Puppet:** Among the four popular types of puppet, i.e., string puppet, shadow puppet, rod puppet and hand or glove puppet, the last one was selected for the study on account of several reasons. The hand or glove puppet is easy to prepare and simple to manipulate. According to Pantopuck

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PUPPET

DRYING OF VEGETABLES

GRAIN STORAGE
also glove puppets are not difficult to make and the plays can be written and acted successfully by amateurs. It is comparatively cheap. This type of puppet can be used in rural conditions where elaborate stage preparation is not possible. Only a cot covered with dark coloured bed cover can serve the purpose of stage. The puppeteer sits behind the screen and holds his arms up so that the audience could only see the puppets which appeared above the screen. The puppeteer could not be seen by the audience. He plays all parts from manipulating the puppets to supply of voices to different characters.

The puppet plays were written for both the practices in Hindi incorporating dialogues in local dialect (Appendix IV). There were three female characters in drying of vegetables practice and one female and two male characters in grain storage practice. In writing the play care was taken that short speeches and quick dialogues were included as these are easy to present. Scenes were so arranged that each puppet had to wear the same costume throughout the play. The play was full of action so as to keep alive the interests of the audience. The songs and musical effects were given as and when required.
Exposure of the Aid: For presenting the puppet show the investigator took the help of the puppeteer from the team of Bhartiya Lok Kala Mandal, Udaipur, as it was not possible to present these two puppet shows without the help of another character. The shows were arranged at night for the selected respondents in the village. It was observed that the respondents were highly amused and delighted during the play. At the end of the show they discussed with the investigator. After the discussion the investigator interviewed the respondents for finding out the gain in knowledge.

**Kavad:** Kavad is a popular local folk traditional medium used for entertainment and religious purpose in Rajasthan and Madhya Pradesh. In structure it is a kind of story box made of light wood. It contains quite a number of folding doors; colourful figures and mythological episodes and incarnations of gods and goddesses are painted on each door. The visuals painted on the doors of the Kavad are unfolded by the 'kavadaya bhat' to the curiosity of the audience as he proceeds with the narration of the story.

For the present study, a Kavad (15" x 9" x 7") was made with three folding doors on each side. The illustrations for both the homemaking practices were developed on the card sheet of 9 x 7 inches to be used on the Kavad
KAVAD
DRYING OF VEGETABLES

FOLDED KAVAD

UNFOLDED KAVAD
doors instead of paintings on the door itself. In all there were 13 cards for drying of vegetables and 19 cards for grain storage practice. After use these cards are removed and several other sets of educational messages can be pasted on the same kavad.

The next step for this aid was to develop the musical narration for both the homemaking practices so that kavad can be used in its traditional form. This also provided opportunity to find out the effect of poetry over prose (Appendix V).

Exposure of the Aid: On the scheduled day the respondents were collected at one place in the afternoon. The kavad was placed on a raised platform so that every one in the audience could conveniently see the illustrations. The investigator started teaching them by opening door one by one along with the musical narration. The audience was always curious to know what followed on the next door.

The respondents watched the illustrations with rapt attention and it was obvious that they happily received the new message through this familiar and age-old medium of entertainment. A brief discussion was arranged after the show and they were interviewed for finding out the gain in knowledge.
Research Tool

Personal interview technique was used for collecting the data. The interview technique was preferred over others because of several added advantages. Since the majority of the respondents selected for study were illiterate, questionnaire technique would not have helped in collecting valid and reliable information. Moreover, the rural people with their background cannot understand the language and meaning of the content of the questionnaire nor are they in a position to give the answers specifically. Interviews provide a situation where face to face discussion can take place and the interviewer finds an opportunity to motivate the respondent to react, can establish rapport with the respondent who in turn can feel free to give answers. Further, some of the aspects, if not clear, may be easily explained to their advantage. Many times misunderstanding and contradictions may creep in, which can be easily removed.

The interview schedule comprised three sections. The first part consisted of general information regarding the respondent. The second part contained the socio-economic status scale developed by Trivedi (Appendix I) with the objective to ascertain the socio-economic status of the respondent. Part three of the schedule contained the knowledge test regarding the homemaking practices.
The interviews were conducted in Hindi and local dialect as and when necessary. The time taken for first interview was 30 to 40 minutes but in the second and the third interviews it was 15 to 20 minutes only as the first and the second part of the schedule was not included in the successive interviews.

Statistical Analysis

For the purposes of analysing the data, several statistical models and tools were used. The most important objective of the study was to find out whether each of the audio-visual aids significantly differs in term of effectiveness. To observe these differences the analysis of variance was employed. Analysis of variance was further used to study the effect of age and socio-economic status on learning and retention.

Another objective of the study was to find out relative effectiveness of the five selected audio-visual aids and to rank them in order of their effectiveness. To achieve this relative efficiency index was used.

In order to establish the relationship between gain and retention of knowledge in each of the selected audio visual aid coefficient of correlation was employed.
Other statistics, such as percentages and mean scores were used to classify respondents on the basis of personal characteristics and to find out the initial knowledge's gain in knowledge and retention of knowledge respectively.

Analysis of variance

Statistical data fall into two categories. The first category is of the class of data represented by observation on a population or part of it where no effort is being made to modify or control any of the possible influencing factors. The second category of data results from varying certain factors in order to determine what effect if any of them have on the data.

Analysis of variance in this study was used to find out whether each of the selected aids differs from each other with respect to their effectiveness. Secondly it was used to find out the effect of age and socio-economic status on gain and retention of knowledge. Although it is very difficult to assign cause and effect by observational data and more so when the human beings are the subjects of study, however, the difference within the groups helps in concluding that there is effect of the factors under study. Properly designed experiments can make it possible to
assign cause and effect, but it is difficult to get the
desired information in case of behavioral sciences.

Analysis of variance limits a study of the action of
two or more independent variables simultaneously on an
affected or depended variables. Analysis of variance
determines and indicates whether there is more variability
between the groups than within the groups.

Coefficient of Correlation

It often happens that changes in one variable are
accompanied by changes in another and that a definite
relation exist between the two. This type of change is
termed as correlation between the two variables. When two
variables change together in such a way that an increase
in one variable causes a corresponding increase in other,
the variables are said to be positively correlated. For
instance, in general, we shall expect a strong positive
correlation between the height of human beings and their
weights, and this has in fact been found to exist. On the
other hand should an increase in one variable go in hand
in hand with a decrease in other, these two variables are
said to be negatively correlated. Thirdly if there is no
relationship between two variables they are said to be
independent or uncorrelated.
The intensity of correlation is measured by a coefficient usually indicated by the symbol 'r' which was computed by the formula:

\[ r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} \]

Coefficient of correlation ranges between +1 and -1. A perfect positive correlation is indicated by +1, while perfect negative correlation is expressed by -1.

As a descriptive measure of association, coefficient of correlation is of considerable use in the study of observational data. It should, however, be noted that coefficient only expresses association by itself. It tells us nothing of the causal relationship of the variates. Thus purely from the knowledge that the two variates x and y are correlated, we cannot say whether variation is the cause or result of variation in y. Or whether the results from mutual dependence of the two variates or from common causes affecting both of them.

The coefficient of correlation in this study was employed to find out the relationship between knowledge gained and retained with respect of each aid. In other words efforts were made to find out whether a particular
aid helped in gaining more knowledge and consequently helped in retaining the knowledge.

Efficiency Index

In order to categorize the selected audio-visual aids on relative effectiveness, efficiency index was used. To use this method the mean scores for each aid were arranged in ascending order. The minimum of the mean scores was taken as the base and assigned 100 units and correspondingly an efficiency index as 1. Subsequently the mean score for each of the other aid was compared in relation to the minimum of the score and proportionately the units were assigned. By doing this it was possible to rank these aids ranging between 1 to 5. This method of ranking the aids on relative effectiveness has been used by several authors, namely Kelsey and Hearne, Marks, Rao, and Rao and Rao.

14 Marks, L.G. The eyes have it but each sense plays a part. Fatis Review. European Productivity Agency CEBC, Paris.
16 Rao, C.S.S. and Rao, P.R.M. Effectiveness of selected audio-visual aids in teaching farmers about foliar spray of urea on wheat crop. Indian J. Ext. Edu. 6 (3 & 4): 53; 1970
Level of Significance

As a part of decision making process in the statistical analysis of the data it became necessary to establish a level of significance. This value was used to determine the level at which the null hypothesis could be rejected. The level of significance chosen for this study was arbitrarily at 0.01 and 0.05 level.