CHAPTER-III

PLAN AND PROCEDURE OF THE STUDY

3.0.0 Introduction

Just as an architect is said to design building free of faults and in considerations of better utilization of funds, saving of time and energy etc in the same fashion a researcher has to design a research project for successful completion of the study. How effective any investigations turns out to be, depends upon the methodology followed. The plan of research study is very important for the conduct of any research work. Without an intelligent planning the difficulties to be encountered during the course of work cannot be anticipated and solved. Planning improves the possibility of better performance in all jobs. Methodology, in fact, is an idea of the whole work or the blueprint of the study. Like the blueprint for the proper construction of massive building, in the field of research, clear and systematic statement of the various research procedures is needed.

Methodology refers to advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in the analysis, keeping in view the objective of the research and the availability of resources. Preparation of the methodology should be done with great care as any error in it may upset the entire project.

Methodology provides information regarding decisions of what, where, when, which, how much and by what means the study was carried out.

The present chapter deals with the various steps in this study. The research procedure has been categorized under the following heads:

- Method of the study
- Sample of the Study
- Tools and Techniques of data collection
- Construction of the tool, administration and scoring of the tool
- Statistical techniques to be used for the analysis and interpretation of the data
3.1.0 Method of the Study

The present research falls under the category of curriculum development study which is a kind of descriptive method. Descriptive research studies are designed to obtain pertinent and precise conclusive information concerning the current status of phenomenon and wherever possible to draw valid general idea from the facts discovered. It is used not just for data collection but for its classification, analysis, comparison and interpretation. Developmental research as opposed to simple instructional development has been defined as “the systematic study of designing, developing and evaluating instructional programs processes and products that must meet the criteria of internal consistency and effectiveness.” (Seels and Richey, 1994)

3.2.0 Sample of the Study

Selection of the sample is an integral part of every research project and its success depends upon the right selection of the sample, so great care was taken in the selection of the sample. Sampling makes economical and accurate inferences because the study of the total population is not possible and it is also impracticable because the practical limitation, cost, time and other factors, are usually operative in the situation, stand in the way of studying the total population. A purposive sampling was applied for selection of school and selection of learning disabled children.

Since the present study deals exclusively with learning disabled populations; the purposive method sampling has been used. The sample was taken from P.V. Girls Inter College, Shakumbhari Inter College, C.B.V. Girls Inter College, Radhaballabh Inter College and Tulsi Devi Inter College of Agra city. The sample consists of 500 Home Science students from X classes, out of which 23 students were found learning disabled. These students formed the total sample.

3.2.1 Criteria for Identifying Learning Disabled Students

To identify learning disabled students in regular schools, the investigator used exclusion–inclusion criteria. (Sharma (1991) and Mahajan (1994) used this method for identification)
• **Exclusion Criteria** (*Children with following characteristics were not included in the sample*)
  
  (i) Children having sensorial handicaps.
  
  (ii) Children scoring below 25th percentile on Raven’s Progressive Matrices A, B, C, D & E.
  
  (iii) Children scoring 50% or above on the diagnostic test of learning disability.
  
  (iv) Children scoring below 50% on learning problem checklist.

• **Inclusion Criteria** (*Children with following characteristics were included in the sample*)

  (i) Children scoring above 25th percentile on Raven’s Progressive Matrices A, B, C, D & E.
  
  (ii) Students scoring below 50% on diagnostic test of learning disability.
  
  (iii) Students scoring above 50% on learning problem checklist.

3.3.0 Tools & Techniques of Data Collection

Following tools were used in present investigations:

• Diagnostic test of Learning Disability (DTLD)

• Checklist for Learning Disabled Children (CLDC)

• Raven Progressive Matrices Test A, B, C, D and E (RPMT)

• Achievement test in Home Science (ATHS)

3.4.0 Construction of the Tool

A meaningful and applicable research needs valid, reliable, suitable, interpretative, economical and usable tool to meet the requirement of the study. Most educational researches lead to the gathering of data by means of some standardized test or self constructed tool. Tool serves an important purpose in research by providing a good base to the researcher for collecting data. The selection and adaptation of research instrument are the critical step of any investigator, which need deep insight of overall field of investigation. According to Best (2001), “Skill in choice and use of research instrument is crucial to the success of the study and validity of its result and conclusions.”
3.4.1 Diagnostic Test of Learning Disability (DTLD)

As there were no readymade tools available to observe the learning disabled students of high school for this study. Therefore researcher constructed self made tool to categorize students as learning disabled and non disabled.

3.4.1.1 Content

The content for the diagnostic test was determined by taking into consideration the areas of academics and language. The seven areas recognised by the Ohio department of education (Orlanslay, 1992) are oral expression, reading skills, written expression, and listening comparison, reading comprehension, maths calculation and maths reasoning. Most of the definitions of learning disabilities concur that learning disabled has difficulty with reading, writing and arithmetic. The investigator has chosen five areas namely written expression, reading comprehension, mathematics calculation, reasoning analysis and analysis ability.

3.4.1.2 Format of First Draft

A first draft test consisting of 65 items were prepared. The items were prepared taking into account the minimum levels of learning required in each of the selected areas. The items were intended to measure the written expression, reading comprehension, mathematics calculation, reasoning analysis and analysis ability of students. All questions were multiple choice containing four alternatives.

3.4.1.3 Experts’ Opinion

The first draft of test was then given to ten experts consisted of distinguished educationist from the area of education and psychology. Their responses and suggestions were used for giving final shape to the test.

3.4.1.4 Preparation of Second Draft (Editing and Revision)

On the basis of experts’ opinion and suggestions, the researcher improved the first draft of the test and edited it accordingly. After editing and revision of the first draft, second draft was prepared on the basis suggestion and expert’s opinion. Some items were deleted, some were replaced and language of some items was revised. After it there were 45 items in second draft. The draft was printed. It consisted of five sections. Necessary
directions were printed on the first page of each section. Separate answer sheet were also prepared.

3.4.1.5 Tryout on A Small Group

Pilot study was conducted to ensure that the tests developed content effectively reflect the levels of achievement of the students of the respective classes and also to ensure the feasibility of the test administration in the terms of language used, instructions, numerical items, total time requirement and such other factors. Test was administered on a small group of 30 students. The student answers were examined with a view to locate the changes needed in the test. The scoring was done giving one point credit for each correct response.

3.4.1.6 Item Analysis

It is the process of establishing the suitability of an item for inclusion in the final test. The quality of each item was ascertained by analyzing two important characteristics of items namely (i) Difficulty index (ii) Discriminating power.

For the present study Stanley method was used to calculate the difficulty power. The answers sheet of each section of the test was analyzed separately. Items having difficulty index between 0.27 and 0.75 and discriminating power above 0.27 were selected for the final test.

3.4.1.7 Distracter Analysis

Since the test consists of multiple choice items, there is every chance for guessing answers. If the distracters are properly given, guessing can be eliminated. The difficulty level was taken as 0.69 (according to Lord, 1952). Therefore, distracter analysis was done to eliminate defective distracters based on the difficulty index and discriminating power.

3.4.1.8 Final Draft

On the basis of suggestions given by experts and experience gained through small group tryout some changes were made. There were 42 items in test after modification. 42 items were selected for the final test based also on the difficulty index and discriminating power of items. These selected items were arranged according to the
difficulty level of the items in each section. The time limit for completing the test was fixed at 40 minutes. The final draft was printed in the form of booklet with necessary instructions and separate answer sheets were printed for answering the test. (See Appendix B)

### 3.4.1.9 Validity of the Test

The validity of a test means the degree to which the test actually measures which is its purpose to measure. The validity provides a direct check on how well the test fulfils the functions. Many a times it tells of more than the degree to which the test is fulfilling its functions. The tool was developed using the proper steps of tool development and in consultation with subject experts the tool consists of construct validity. According to Best (2001), “Skill in choice and use of research instrument is crucial to the success of the study and validity of its results and conclusions.”

### 3.4.1.10 Validity of the Diagnostic Test

The face validity was established by the judgement of experts in test construction.

### 3.4.1.11 Empirical or Statistical Validity

The statistical validity of written expression, reading comprehension and analysis ability test were calculated by correlating the scores of the test with marks obtained for the first terminal examination in language. The empirical validity of the mathematics calculation and reasoning were calculated by correlating the scores of the test with marks obtained for the first terminal examinations for mathematics. Product moment was used for measuring statistical validity. The correlation coefficient was 0.73. The obtained value indicates that the test had high empirical validity.

### 3.4.1.12 Reliability of the Diagnostic Test

Reliability refers to the consistency of scores or measurement which is reflected in the reproducibility of the scores. A test is said to be consistent over a given period of time when all the individuals retain their same scores on two separate testing with the same test. Anatski (1968), “Reliability means consistency of scores obtained with the test on different sets of equivalent items under variable examination conditions”. The test-
retest method was used to estimate reliability of the test. The reliability was determined by using product moment method. The obtained score is 0.77. This shows high reliability.

3.4.1.13 Objectivity of the Diagnostic Test

The objectivity of a test affects both the validity and reliability of it. In the diagnostic test prepared inclusion of only objective type items ensured objectivity except written expression.

3.4.1.14 Practicability

The present test was easy to administer as it was in the booklet form. It was economical, as it was reusable. The answer sheets were provided separately. Time needed for scoring was minimized as the window stencil method was adopted.

3.4.1.15 Administration of the Tool

The necessary permission from school authorities were obtained before administration of test. After striking a good rapport, the tool was administered on home science students of secondary school. The researcher gave the instructions to students before distributing the tool and also noted their gesture, face making, expressions, concentration and duration of time. The researcher tried to make the conversations with the respondent interesting and meaningful.

3.4.1.16 Scoring of the Tool

After administration of the diagnostic test, the results obtained were analyzed by the investigator, enabling her to point out the weakness of the students. The right responses were assigned one mark and wrong responses were given zero mark and the right response of Section A was assigned 5 marks for each question.

3.4.2 Checklist for Learning Disabled Children (CLDC)

Once the child starts school, signs of learning disability can become more apparent more readily. Teacher may note the learning problems in students. The researcher interacted with some of the senior teachers to understand the learning problem of students for preparing the item for the learning problem checklist. The first draft of checklist consisting of 40 items was prepared Out of 40 items, 32 were selected for the
final checklist on the basis of experts’ suggestions and opinion. These items were
categorized under different areas of learning difficulties like academic symptoms,
classroom behaviour and motor response. (See Appendix C)

3.4.2.1 Validity and Reliability

Validity of the learning problem checklist was determined on the basis of face
validity. Validity was determined on the basis of experts’ opinions that were requested to
examine the tool according to the set objectives. The test has a retest reliability of 0.65.
The right responses (Yes) were assigned one mark and wrong responses (NO) were given
zero mark.

3.4.3 Raven’s Progressive Matrices A, B, C, D and E

This is a non-verbal group test. It is administered to measure a person’s capacity
to apprehend meaningless figures presented for observation, see the relations, between
them, conceive the nature of the figures completing each system of relation presented and
so develop a systematic method of reasoning (Raven, 1960). The test is intended for
pupils above 11 years of age. The test consists of 60 problems divided into five sets of 12
each. In each set, the first problem is the easiest one and the consecutive problems
become gradually difficult in each set. The order of the tests provides the standard
training in the method of working. The five sets provided five opportunities for grasping
the method and five progressive assessment of a person’s capacity for intellectual
activity. The tests are meant to evaluate the person’s ability to discern and utilise a logical
relationship presented by non-verbal materials. The problem requires in varying degrees,
analytical and integrating operations of the kind called ‘insight through visual activity’.
The test is intended to cover the whole range of intellectual development of a child.

Everyone irrespective of his age is given exactly the same series of problems in
the same order and asked to work at his/her own speed, without interruption from the
beginning to the end of the test. A person’s total score provides an idea of his/her
intellectual capacity, whatever be his/her nationality or education.

In a study on the effect of timing on predictability Raven’s test scores, Tampuarti
(1969) arrived at the conclusion that twenty minutes seem to be the most satisfactory time
span to complete the test, for the purposes of prediction of the intelligence of pupils at the
secondary level. The test has retest reliability varying with the age from 0.83 to 0.93. It correlates 0.82 with the Term and Merrill scale and has been found to have a ‘g’ saturation of 0.82 (Raven 1960p2). This test is a popular measure used in Indian Schools. Scoring of the test was done according to norms given in the manual. These students who got score above 25th percentile were selected for the sample. (See Appendix D)

3.4.4 Achievement Test in Home Science (ATHS)

It is content based achievement test. Achievement test attempts to measure what an individual has learnt or what is his or her present level of performance. Most tests used in schools are achievement test. They are particularly helpful in determining individual or group status in academic learning. Achievement scores are used in placing, advancing or retaining students at particular grade levels.

3.4.4.1 Format of First Draft

To prepare the achievement test of Home Science the researcher has carefully studied the text books of Home Science prescribed for class 10th. The researcher then framed questions from these topics. These questions were taken in the achievement test. A first draft question paper consisted of 80 multiple choice items.

3.4.4.2 Experts’ Opinion

The first draft of test was then given to 10 Home Scientist. The items were scrutinized by them and modifications were made according to their suggestions. Irrelevant items were removed from the test on the basis of ambiguity of language and understanding the specific terms.

3.4.4.3 Preparation of Second Draft (Editing and Revision)

On the basis of experts’ opinion and suggestions, the researcher improved the first draft of the test and edited it accordingly. After editing and revision of the first draft, second draft was prepared on the basis suggestion and expert’s opinion. Some items were deleted, some were replaced and language of some items was revised. After it there were 58 items in second draft. The draft was printed. It consisted of five sections. Necessary directions were printed on the first page of each section. Separate answer sheet were provided.
3.4.4.4 **Tryout on A Small Group**

Pilot study was conducted to ensure that the tests developed content effectively reflect the levels of achievement of the students of the respective classes and also to ensure the feasibility of the test administration in the terms of language used, instructions, numerical items, total time requirement and such other factors. Test was administered on a small group of 30 students. The student answers were examined with a view to locate the changes needed in the test. The scoring was done giving one point credit for each correct response.

3.4.4.5 **Item Analysis**

It is the process of establishing the suitability of an item for inclusion in the final test. The quality of each item was ascertained by analyzing two important characteristics of item namely (i) Difficulty index (ii) Discriminating power.

For the present study Stanley method was used to calculate the difficulty power. The answers sheet of each section of the test was analyzed separately. Items having difficulty index between 0.27 and 0.75 and discriminating power above 0.27 were selected for the final test.

3.4.4.6 **Distracter Analysis**

As the test consists of multiple choice items, there is every chance for guessing power. Guessing can be eliminated with use of distracter analysis. The difficulty level was taken as 0.69 (according to Lord, 1952). It was done to eliminate defective distracter based on the difficulty index and discriminating power.

3.4.4.7 **Final Draft**

On the basis of suggestions given by experts and experience gained through small group tryout some changes were made. There were 53 items in test after modification. But 50 items were selected for the final test based also on the difficulty index and discriminating power of items and for statistically convenient. These selected items were arranged according to the difficulty level of the items in the each section. The time limit for completing the test was fixed to be 40 minutes. The final draft was printed in the form of booklet with necessary instructions and separate answer sheet were printed for answering the test. (See Appendix E)
3.4.4.8 Validity of the Achievement Test

Content validity is the representative or sampling adequacy of the content, the substance of the matter and topics of measuring instrument (Mark, 1996). The different subunits of the content were carefully examined for ensuring content validity. The content validity was established by the judgement of experts in Home Science test construction.

3.4.4.9 Statistical Validity

It was calculated by correlating scores of the achievement test with marks obtained for the first terminal home science examination. The correlation coefficient obtained was 0.85. The obtained value indicates that the test had very high empirical validity. Product moment was used for measuring statistical validity.

3.4.4.10 Reliability of the Test

The test-retest method was used to estimate reliability of the test. The reliability was determined by using product moment method. The obtained score is 0.87. This shows very high reliability.

3.4.4.11 Objectivity of the Test

In achievement test prepared the inclusion of only objective type items ensured objectivity. Using scoring key for evaluation also ensured objectivity.

3.4.4.12 Practicability of the Test

The prepared achievement test was simple and easy to administer. It was economical as it was reusable, since the answer sheets were provided separately. The window stencil method was adopted for scoring the test. The test has good practicability.

3.4.4.13 Administration of Final Draft

To administer the test on the girls, permission was taken from the principal of the selected schools then the test was distributed to girls in the class. The researcher gave the instructions to students before distributing the test. The researcher tried to make the conversations with the respondent interesting and meaningful. On the completion of the test by every student the researcher collected back the answer script.
3.4.14 Scoring of the Test

After administration of achievement test, the result obtained were analysed by the investigator, enable her to figure out the weakness of the students. The right responses were assigned one mark and wrong responses were given zero mark.

3.4.5 Evaluation of Half Yearly Exam Answer Books

Answers books of half yearly examinations of learning disabled students were also studied to find out the areas of weakness.

3.4.6 Development of Instructional Material

For the development of instructional material following steps were used according to present research based on Saylor and Alexender (1981). They were given as below:

3.4.6.1 Identification of the Problem Areas in Home Science

To identify the problem areas of learning disabled students having Home Science subject the achievement test was used. They had difficulty in answers related to certain topics like identifying the diagram, location of them, labelling of given figure; remembering and retention capacity was found low in those topics which had been taught by the teacher earlier in the class. Psychomotor skills like stitching, embroidery, cutting and drafting were also found poor. Therefore, on the basis of above, the researcher tried to remove difficulties in above areas by developing instructional material for learning disabled students having Home Science subjects. There was found a gap between the intellectual potentiality and actual performance of these students.

3.4.6.2 Formulation of the Objectives

To develop instructional material for minimizing learning disabilities in order to facilitate the learner in-

- Organizing information.
- Remembering and expression the information.
- Reading, writing, comprehending and reasoning.
- The psychomotor skills.
3.4.6.3 Specific Objectives

For developing the above abilities following specific objectives were formulated to enable students.

- Describe and apply the elements of arts and principles of design in daily activities.
- Use of units of different measurements and apply in daily activities.
- Use different type of stitches with efficiency in making seam.
- Make beautiful samples of different type of embroidery.
- Identify the different fibers and fabrics used in daily clothes and sources of fibers.
- Make drafting of Petticoat.
- Describe different nutrients, its deficiency diseases, symptoms, side effects of overdose of any nutrients and its sources in foods.
- Use of different sources of balanced diet and include it in their diet.
- Explain the skeletal system and joints; Identify and draw bones & joints diagram.
- Locate and identify the digestive organs.
- Draw different digestive organs.
- Explain anemia disease, symptoms, cause of its deficiency and prevention of this disease.
- Describe symptoms, sources, causes and prevention of kwashiorkor and rickets.
- Describe importance of immunization in human health and prevention from diseases.

3.4.6.4 Development of Content Outline

After formulation of the objectives, the content outline suitable for the attainment of objectives had been developed. The contents were analyzed and arranged sequentially according to areas. These were as follows:
• **Home Management**
  o Concept and importance of element of arts like line, size, texture and color.
  o Concept and meaning of principles of design, their characteristics, function and importance of principles like proportion, harmony, emphasis and balance.
  o Concept and importance of units of measurements in Home Management, units of measurements like length, general measure and measuring liquid substance.

• **Clothing & Textile**
  o Name of stitches, method and uses of different type of stitching.
  o Importance of embroidery, types of embroidery, tools used in embroidery and methods to draw pattern for embroidery, different types of embroidery stitching.
  o Name of fibers, its classification, manufacture, structure, function and characteristics of cellulosic, animal, mineral, manmade and chemical fibers.
  o Material required for measurements, measurements and methods of Drafting of petticoat.

• **Food & Nutrition**
  o Nutrients, structure, sources, functions and deficiency diseases due to lack of protein, carbohydrates, fat, vitamins and minerals.
  o Concept of balanced diet, its sources, functions and its importance in different stages of life like infancy, childhood, adolescent, pregnancy and adult and old age and diet according to different working group.

• **Human Physiology**
  o Concept and importance of human skeletal system, structure of bones, its classification, types, parts of bones and number of bones, its function and classification and different parts of human skeleton like head, trunk and extremities.
  o Parts of trunk, location, number of bones in chest, functions, structure of organs located in abdomen, structure and function of spinal cord.
  o Location, Structure and function of shoulder, girdle and pelvic girdle etc.
  o Classification of skull like cranium and face, name, number of bones and location, function of cranium bones and face.
Classification of upper extremities, upper arms and lower arms, its classification, structure and function of shoulder, blades, humorous, carpal and phalanges etc.

Joints: importance and structure and its types and location of joints among different bones.

Concept and importance of digestion in human body

Process of digestion in mouth, structure of teeth, their function and location in mouth.

Location, Structure and functions of other organs like pharynx, gullet, stomach, duodenum, small and large intestine etc.

Location, structure and functions of supporting organs like liver, gall bladder, spleen and pancreas etc.

Health & Hygiene

Concept of Anemia, its causes, symptoms and prevention.

Concept of Rickets and kwashiorkor, its causes, symptoms and prevention.

Concept of Immunization, its schedule and importance in human health.

3.4.6.5 Development of Material

The instructional material was categorized into two types: Self instructional material (SIM) and IT based material.

Self Instructional Material (SIM)

This material was basically designed in the form of programmed learning based instructional material. It was considered appropriate to follow linear programming as given by B. F. Skinner. The frames consisted of stimuli that called for a specific action or set of actions, the learner was to perform after learning from the programme.

The researcher decided to prepare the topics by analyzing the contents that suit the needs of the students with learning disabilities. The content was analyzed in terms of behavioural objectives. The learning material was then divided into frames. Each frame was a small segment of subject matter that called for particular student responses. Frames are presented in units and subunits.
The units are divided into sections for easy reading and better comprehension. For purpose of uniformity the researcher has employed the same scheme of ‘partitioning’ in every unit. Self check exercise under the section ‘Check Your Progress’, have been provided at two / three places in each unit and model answers at the end of each unit. Prompts were provided on the programme frame to guide the student for making correct response. In the last section of each unit, under the heading ‘Let us sum up,’ the whole unit was summarized for purpose of recapitulation and ready reference. The material was provided with activities and experiments to be performed by the students so that the scientific attitude and critical thinking could be developed. These activities also encourage them to have interaction with the teachers and classmates. After each sub-unit and content, formative evaluation questions were given so that the students could check themselves before proceeding to the next unit.

• **IT Based Material**

The instructional material was designed in the form of Video and instructions based Power point presentation to enhance knowledge of learning disabled students related Home Science subject by increased attention span and easy comprehension etc. The video and instructions based power point presentation were prepared with the help of software (PINNACLE-14 Version and Window Microsoft office power point presentation respectively). There were very instructions like moving to next slide, previous slide, home and quit for students to enable them to more at their own pace of learning. Self check exercise under the section ‘Check Your Progress’, have been provided at the end of each topic. Prompts were provided on the programme frame to guide the student for making correct response. Where the response was incorrect, In case of incorrect response, student was asked to make another attempt. Self instructional material, instructions based power point presentation and videos were prepared on the following topics:

• **Home Management**
  - Power point presentation on elements and principles of arts
  - Power point presentation on units of measurements.
• Clothing & Textile
  o Video on making stitches.
  o Video and power point presentation on embroidery.
  o Video and power point presentation on fibers.
  o Video and SIM on draft of petticoat.

• Food & Nutrition
  o SIM and Power point presentation on Nutrients.
  o Power point presentation on balanced diet.

• Human Physiology
  o SIM and Power point presentation on human skeletal system.
  o SIM and Power point presentation on human digestive system.

• Health & Hygiene
  o Video and power point presentation on anemia.
  o Video and power point presentation on rickets and kwashiorkor.
  o Power point presentation on immunization.

3.4.6.6 Editing of the Material

Collection of relevant materials required for the preparation of instructional material was the first step taken by the researcher. The material referred to pictures, documentaries and other kind of animation related to the topic which had to be further compiled to be figured out in the form of a developed material. All the pictures selected though different sources were edited and appropriate sections were cropped with the help of a software i.e. Adobe Photoshop. The sorted out pictures were then placed according to the sequence on the basis of topics and subjects as were edited by the researcher. The entire videos were developed and edited with the help of software (PINNACLE-14 Version).

3.4.6.7 Experts’ Opinion

The prepared material was further sent for expert’s suggestions. The experts comprised of five teachers of secondary schools, who are specialized persons in the area
of Home Science. The expert’s suggestions were incorporated which made the instructional material more effective and helped the process to accomplish objectives of the research. Instructional material was then suitably edited.

3.4.6.8 Printing of Final Draft

A great care was taken in printing of final draft to ensure:

- Clarity of printing
- Appropriateness of the size of letters.
- Attractiveness
- Clarity of instruction
- Proper layout on each paper
- Adequacy of spacing for writing
- Proper spacing between statements
- Adequacy of space for responding (See Appendix A)

3.4.6.9 Assessing the Efficacy of Developed Material

Developed material was administered on small group of learning disabled students. This exercise was continued for a fortnight. During each of these sessions the researcher was present to observe that the instructions were meticulously followed by the students and to assist wherever needed. Practical sessions were also organized to develop psychomotor skills. To gauge their understanding of the subject matter post test was administered thereafter. The scores of this post achievement test were compared with their pre achievement scores.

3.5.0 Statistical Techniques

The role of statistics in research is to function as a tool for designing research, analyzing its data and drawing conclusions there from. The raw scores obtained from tool of learning disabilities were tabulated and measures of central tendency calculated. In order to arrange and draw out the essence from the collected data and to make the data meaningful, following statistical techniques were used.
3.5.1 Descriptive Statistics

Certain descriptive statistics were computed in order to describe the nature and contribution of scores obtained through various tests. The preferred techniques were:

- **Mean**

  The mean of distribution is commonly understood as the arithmetic average. Arithmetic mean is most widely used in statistical research because it is easy to understand and calculate. If the measure of each item in a series is known the mean can be sieved by adding the measures together and dividing by the number of items. (Formula in Appendix F)

- **Standard Deviation**

  The concept of standard deviation was first suggested by Karl Pearson in 1893. It may be defined as the positive square root of the arithmetic mean of the squares of deviation of given observations from their arithmetic mean. (Formula in Appendix F)

3.5.2 Inferential Statistics

For draw conclusions following inferential statistics were used.

- **Test of Significance**

  ‘t’ test was used to compare the pre and post scores of achievement test in Home Science and for independent and correlated means were employed. (See formula in Appendix F)

3.5.3 Graphic Representation

Another important convincing, appealing and easily understood method of presenting the statistical data is the use of diagrams and graphs. They give a bird’s eye view of a given set of numerical data. They register a meaningful impression on the mind almost before we think. Therefore graphs on score of diagnostic test, pre and post achievement scores were prepared by the researcher.

3.6.0 Overview of the Chapter

In this chapter, the design of the study was outlined. A sequential schedule of the steps involved was given and the purposive method of sampling was found suitable for
learning disabled population. The self made tool as diagnostic test of learning disability (DTLD), checklist for learning disabled children (CLDC), and achievement test in Home Science (ATHS) were constructed. The validity and reliability of the test were reviewed and seemed justifiable. The instructional material was divided into two categories as SIM and IT based material based on program learning on Home Science subjects. The instructional material was prepared for making the subject easier and at the level of learning disabled students and the researcher was tried to present content in attractive manner.