CHAPTER IV

METHODOLOGY

4.1 METHOD ADOPTED FOR THE STUDY

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METHODOLOGY

Methodology describes the procedure or technique used by the investigator for conducting an investigation and it outlines the details of the description of the research variables and procedures. Method is a set of procedures and techniques for gathering and analysing data (Strauss & Corbin, 1998, p.3). It refers to the study design through which the validity of elements is to be established. A suitable method helps the researcher to explore the various dimensions of the study. The reliability and validity of the findings also depends upon the method adopted and hence methodology occupies a very prominent place in the field of any research.

The present study was intended to develop a strategy based on Experiential learning for enhancing Leadership quality, Business interest and Achievement in commerce of students at higher secondary level. The details of the methodology adopted for the study are presented as follows:-

4.1 Method Adopted

The present study was intended to develop a strategy based on Experiential learning for enhancing Leadership quality, Business interest and Achievement in commerce of students at higher secondary level. In order to find out the effectiveness of the developed strategy, Experimental method was adopted.
Experimental method is a systematic and logical method of hypothesis testing under carefully controlled conditions. It is the most sophisticated, exact and powerful method for discovering and developing an organized body of knowledge. It is the only type of research that directly attempts to influence a particular variable, and can really test hypothesis about cause and effect relationship. The results of experimental research permit prediction and it provides for much control and therefore establishes a systematic and logical association between manipulated factors and observed effects.

**Design selected**

“Experimental design is the blue print of the procedures that enables the researcher to test hypotheses by reaching valid conclusions about the relationship between independent and dependent variables”(Best & Kahn, 2008). It attempts to ensure valid casual inferences from randomized experiments conducted within practical constraints of available resources and time.

In the present study, pre-test post-test non-equivalent group design was used. One group is usually referred as the Experimental group and the other group as the Control group. This design is often used in class room experiments when experimental and control groups are such naturally
assembled groups as intact classes, which may be similar (Best & Kahn, 2008).

4.2 Variables in the study

“Variables are the conditions or characteristics that the experimenter manipulates, controls or observes” (Best & Kahn, 2008). Variables are those attributes or objects, events, things and being, which vary and can be measured. For an experimental study, there are independent variables, dependent variables and extraneous variables. In the present study, the variables involved are,

4.2.1 Independent variables

“The independent variables are the conditions or characteristics that the experimenter manipulate or control in his attempt to ascertain their relationship to observed phenomenon” (Best & Kahn, 2008). The independent variables of this study were, Developed Strategy based on Experiential learning and existing Activity oriented method.

4.2.2 Dependent Variables

The dependent variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes or change the independent variables (Best & Kahn, 2008). In the present study, Leadership quality, Business interest and Achievement in commerce are the dependent variables.
4.2.3 Extraneous Variables

There is every chance of many extraneous variables to affect the experiment. Among them, previous Achievement in commerce, general mental ability, age level of the students, time of instruction etc. are considered as the major extraneous variables affecting the experiment.

4.3 Population of the study

Polit and Hungler (1999) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. For the present study, the investigator selected all the students studying in standard XII in the Higher Secondary schools of Kerala as the population of the study.

4.3.1 Sample selected for the study

A sample is a small group of cases drawn from and used to represent the large group or whole population under investigation. Therefore sample size is the number of people or objects in the selected sample (Manheim & Rich, 1995). The population consisted of all the Higher Secondary school students studying in standard XII affiliated to Kerala state syllabus. The investigator decided to adopt stratified random sampling method keeping in view the experimental nature of the study, its demands and limitations.

The investigator selected 240 students belonging to four divisions of standard XII (Two divisions from Govt. Boys HSS, Adoor and two
divisions from S.N.V H.S.S, Angadickal). Out of the selected two divisions of standard XII from each school, one division was considered as the Experimental group and the other was considered as the Control group.

The initial sample consisted of 250 students. By removing the absentees in pre-test and post-test, the total number of students included in the study was reduced to 240, out of which 120 students belongs to experimental and 120 students belongs to control group. The break-up of the sample selected for the study is given in Table 4.1

**Table 4.1**

*Breakup of the sample for the study*

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Name of the school</th>
<th>Boys/Girls/ co-education</th>
<th>Type of school</th>
<th>No. of students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. Boys H.S.S., Adoor</td>
<td>Co-edn</td>
<td>Govt</td>
<td>EG, CG</td>
<td>120</td>
</tr>
<tr>
<td>2</td>
<td>S.N.V H.S.S Angadickal</td>
<td>Co-edn</td>
<td>Aided</td>
<td>60, 60</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>120, 120</strong></td>
<td><strong>240</strong></td>
</tr>
</tbody>
</table>

**4.4 Tools used for the study**

The selection of suitable tools is of vital importance for a successful research. In order to carry out any type of research, data must be gathered and different tools must be employed to aid in the acquisition of data.
These tools employ distinctive ways of describing and quantifying the data and are particularly appropriate for yielding information of the kind and in the form that can be most effectively used.

The tools used in the study are:-

4.4.1 Questionnaire for assessing the present status of teaching Commerce at Higher Secondary level

4.4.2 Lesson Transcripts on the developed strategy based on Experiential Learning (Prepared by the investigator)

4.4.3 Lesson Transcripts on Existing Activity Oriented Method (Prepared by the investigator)

4.4.4 Leadership Quality Scale (Prepared by the investigator)

4.4.5 Business Interest Inventory (Prepared by the investigator)

4.4.6 Achievement Test in Commerce (Prepared by the investigator)

4.4.7 Raven’s Standard Progressive Matrices

**4.4.1 Questionnaire for assessing the present status of teaching Commerce at higher secondary level**

The questionnaire on the present status of teaching commerce at higher secondary level was prepared by the investigator in consultation with experts and teachers in the field of commerce and education. It was
intended to collect information from Higher Secondary Commerce teachers about the present status of teaching commerce at higher secondary level.

As a prelude to the development of questionnaire, the investigator had discussions with the teachers who were handling commerce at Higher Secondary level. It helped the investigator to develop a questionnaire that deals with several problems faced by the teachers.

The questionnaire contains two sections. - section 1 deals with personal information about the teachers such as name, qualification, teaching experience etc. and section 2 deals with information regarding teaching of commerce, containing areas like the internal environment of the school, availability of e-learning facilities, learning strategies, training and development programmes provided by the authority, activities related to teaching commerce and support material. Initially there were 25 items related to the two sections with the consultation of experts after considering the validity of questionnaire.

The draft questionnaire was tried out on 10 teachers and it helped the investigator to know the pros and cons of the questionnaire. Based on the feedback, necessary modifications were made in the questionnaire. The number of items in various categories of the questionnaire (section II) is given on the Table below.
Table 4.2
Break up of Number of items in various Categories in the Questionnaire

<table>
<thead>
<tr>
<th>Sl no.</th>
<th>Categories</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Method of teaching</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Classroom activities</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Resources and support materials</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Training/Seminars</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Others</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>

A copy of the final form of the questionnaire is given as Appendix I

The investigator gave questionnaire to 25 commerce teachers at Higher Secondary level. Teachers marked their opinion as ‘Yes’ or ‘No’ by putting a tick mark in the appropriate column. The responses were collected and scored.

The data collected was then analysed and is given in the next chapter.

4.4.2 Lesson Transcripts on the developed strategy based on Experiential Learning

After going through the literature on Leadership quality, business interest and Experiential learning, the investigator developed a learning strategy based on Experiential learning for enhancing Leadership Quality,
Business Interest and Achievement in Commerce of students at Higher Secondary level.

The details of the procedure adopted for the development of the strategy is presented as follows:-

4.4.2.1 Experiential Learning Strategies

Weinstein and Mayer (1986) defined learning strategies broadly as "behaviours and thoughts that a learner engages in during learning which are intended to influence the learner's encoding process". It focuses on making the students more active learners by teaching them how to learn and how to use what they have learned, to solve problems and become successful. Williams & Burden (1997) indicated that when students are involved in a learning task, they have several resources which they use in different ways to finish or solve the task, so this can be termed process of learning strategy. It helps to make learning meaningful.

In Experiential learning, students are engaged intellectually, emotionally, socially, soulfully and physically. Experiential learning involves a number of steps that offer student hands on, collaborative and reflective learning experience which helps them to fully learn new skills and knowledge (Haynes, 2007). Experiential learning strategy helps to satisfy the objectives of learning through group discussion, buzz session, problem
solving, simulation, co-operative learning, project based learning and role playing etc.

4.4.2.2 Key Principles of Experiential Learning

1. Learning is more efficient when the subject matter is relevant to the personal interests of the students

2. Learning which is threatening to the self (e.g., new attitudes or perspectives) are more easily assimilated and faster when external threats are at a minimum

3. Self-initiated learning is the most lasting and pervasive.

4. Students should have complete control over the entire learning process, its nature and direction

5. Self-evaluation should be the principle method of assessment.

4.4.2.3 Major Elements in Experiential learning activities

- **Meaning Making**

  Learning through real life experience allows students to relate their knowledge to their daily lives. Hence, students can easily assimilate their knowledge and hence to apply what they have learned. Providing a context and giving students situations make them know the meaning of the tasks.

- **Paradigm Shifting**

  This refers to the change of students’ implicit ideas, assumptions and beliefs. Experiential learning activities allow students to visualise, to
understand and to enact the assumption and implications of different ideas and perspectives which can later help students’ character development.

- **Self-Understanding**
  
  By reflecting on their own performance regularly and in a guided manner, students pay more attention to their own thinking. This kind of meta-thinking is especially important in personal change and growth.

**4.4.2.4 Teachers’ role in Experiential Learning**

1. The teacher will set a positive atmosphere for learning

2. The teacher will act as a guide. This allows students to make mistakes and learn from them throughout the whole process. The teacher will clarify the concepts and the purposes of each stage whenever needed.

3. The teacher will give students, learning resources and information both before and during the task when students are stuck.

4. The teacher will provide students with freedom for experimentation during the task, so that they are able to discover the solutions.

5. The teacher will share feelings and thoughts with learners but is not dominating. This enables students to reflect on their own.
4.4.2.5 Strategies on Experiential Learning

Based on learning theories put forward to Kolb (1984), Boud & Walker (1992), Dean (1993) and Joplin (1981) the investigator developed the strategy.

4.4.2.5.1 Kolb’s model on Experiential Learning

Kolb (1984) presented the four-stage cyclic process, and the four stages are namely Concrete experience, Reflection, Abstract conceptualisation and Active experimentation. He also related Experiential learning and learning styles. He highlights the difference among individual personalities and learning preference may result in the inclination towards a particular stage. According to Kolb, experiential learning can be described as a four-stage process, in which an individual can start from any stage but the sequence of the stages remains the same. Two stages (Concrete Experience and Abstract Conceptualisation) in the cycle involves experience while the other two (Reflection and Active Experimentation) involves the transformation.

- Concrete Experience: Doing. Through participation in learning activities, students get hands-on experience on problem-solving tasks. The experience is personal and involves individual affections.

- Reflection: Observing. Students recall their memory or look at records of the learning activities, they review and reflect on the process either
individually or in a group. Learners observe others’ behaviours during the activities as well.

- **Abstract Conceptualisation:** *Thinking.* Students generalise knowledge and theory from the previous experience based on the reflection.

- **Active Experimentation:** *Planning.* Students then modify existing concepts and knowledge with the new theory they come up with and apply in later occasions.

### 4.4.2.5.2 Boud and Walker’s stages of experiential learning

According to Boud and Walker (1992), Experiential learning is a series of stages where there is some kind of preparation done before a learning event, the actual experience itself and then reflection to debrief the learner on what took place. This incorporates two important aspects of Kolb’s model like experience and reflection. It also adds a third: preparation for the event that they feel is important in having learning take place. “Greater use can be made of learning events if the learners prepare beforehand” (p.165).

When considering preparation for a learning event, the facilitator needs to focus on what experiences the learners bring and what they want to learn. Learners bring with them ‘intent’ which may or may not be able to be articulated and which influences their approach to the event (Boud & Walker, 1992, p.166).
4.4.2.5.3 Deans’ process model of experiential learning

Dean (1993) presents a process model of Experiential learning in adult education as a series of stages in the process of developing and implementing an experiential learning activity.

1. Planning- Getting ready to start
2. Involvement – getting started
3. Internalisation- Learning by doing
4. Reflection- making meaning
5. Generalisation-making connections
6. Application- transfer of learning
7. Follow-up-Assessment & planning

Dean found Experiential learning as a process through which the facilitator goes through to develop the learning experience. The central concepts of his model relates to the other theories of experiential learning in that there needs to be some kind of experience(involvement and internalisation) and a reflection on that experience.

4.4.2.5.4 Joplin’s five stage model

Joplin (1981) follows the action-reflection process, however, she adds three other stages that are similar to Boud and Walker’s and Dean’s models. Her first stage is focus, which defines the task to be completed and focuses
the learner’s attention on that task. Second is action, where the students must become involved with the subject matter in a physical, mental or emotional manner. The third and fourth stages are support and feedback. These are present throughout the learning experience and are provided by the instructor or follow learners. The fifth and last stage is debriefed, where the learners and facilitator sort and order the information and reflect on its implications.

4.4.2.6 Development of the strategy based on Experiential learning.

The major objective of the present study is to develop a strategy based on Experiential learning for enhancing Leadership quality, Business interest and achievement in commerce at higher secondary level. Research studies shows that experiential learning strategies can overcome the learning difficulties and school failure. Related literature has given significant evidence to the need for an Experiential learning strategy for commerce education at higher secondary level. Also various educational boards and curriculum planners have recommended the importance of Experiential learning strategy for higher secondary commerce students. The problems faced by the commerce students due to conventional classroom teaching forced the investigator to develop a strategy based on Experiential learning to cope with the changing and challenging curriculum.
Experiential learning strategy is designed by the investigator after attending a lot of training programmes, seminars, workshops related to experiential learning. Also the strategies put forward by Kolb, Boud and Walker, Dean, Laura Joplin etc were referred for designing the strategy.

After thoroughly analysing the theoretical constructs of Experiential Learning, Leadership quality, Business interest and various innovative learning strategies, the investigator developed a strategy based on Experiential learning for enhancing Leadership quality, Business interest and Achievement in commerce. The different steps involved in developing the strategy based on Experiential Learning are given as follows:

Step 1: Assessing the learners and the contexts of learning

Step 2: Identifying the Goals of the Strategy

Step 3: Selecting the content and conducting Content Analysis

Step 4: Designing the strategy

Step 5: Developing Lesson format

Step 6: Trying out the Developed strategy

Step 7: Evaluating the strategy
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**Fig 4.1** Steps in developing the strategy based on Experiential Learning.

The description of each step is given below.

**Step 1: Assessing the learners and the contexts of learning**

A learning strategy will be successful only if it is developed in accordance with the characteristics of the target group (learners). For that,
before developing the strategy the investigator assessed the learners and the contexts of the learning.

While assessing the learners the investigator considered the following criteria:

a. The age level, education and the learning needs of the learner

b. The previous knowledge of the learner regarding about the topic

c. The obstacles experienced by the learner while learning the concerned subject

d. Learner’s interaction with learning environment

e. The academic motivation received by the learner

In addition to these, while developing a learning strategy, the investigator also considered the contexts of the learning. It involves both performance contexts as well as learning context. Performance context is the context in which the learners will use their acquired skills and knowledge after the instruction is completed. Learning context is the set of circumstances that are relevant when someone needs to learn something.

In this study the investigator selected the target group as the students studying Commerce in Standard XII of Higher Secondary schools of Kerala. Through certain informal discussion with these students, the investigator gained some information regarding the needs of the learners,
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their previous knowledge, their interaction with the learning environment, the difficulties experienced by them in learning commerce and the academic motivation they receive from their environment.

**Step 2: Identifying the Goals of the Strategy**

A strategy is basically a goal oriented action. Hence before developing a strategy the investigator identified the goals of the strategy.

In this study, students of standard XII belonging to the Higher Secondary schools following Kerala state syllabus were taken as the target group. The major goal of the strategy is to help the students to enhance Leadership quality, Business interest and Achievement in commerce.

**Step 3: Selecting the Content and conducting Content Analysis**

The investigator selected the topics included in the Kerala State Higher Secondary school commerce syllabus of standard XII for attaining the goals of the strategy based on Experiential learning. In this syllabus of standard XII, the investigator selected two business studies units, “Nature and significance of management” and “Principles of management, Planning and Organizing”.

The investigator made a thorough analysis of the content and the related problems were identified by making use of guidelines in the Teachers Hand Book (Standard XII) prepared by SCERT. The problems
related to content are specific for each of the selected sub units. After the problems were identified, the investigator prepared the list of objectives.

**Content and Curricular Objectives of Selected Units in Commerce**

**Unit -1.Nature and Significance of management**

Sub unit 1.1: Management: Need and Importance

*Problems related to the content:*-

- What is the meaning of management?

- What will be the primary goal of business organisation?

- How can we achieve business goals?

- What is the role of business in economic growth?

- What are the important external and internal changes that affect business?

*Objectives:*-

- Identify the meaning of management.

- Understand the primary goal of business organisation.

- Get an idea about different ways to achieve business goals.

- Identify the relationship between business and economic growth.

- Recognise various changes that affect business.
Sub Unit 1.2: Nature and Features of Management.

Problems related to the content:-

- What are the various activities performed by a manager?
- What are the various features of management?
- Whether management is art or science?
- Shall we consider management as a profession?

Objectives

- Identify the various activities performed by a manager.
- Understand the features of management.
- Relate the term management with science.
- Identify that management is an art and profession.

Sub Unit 1.3: Management and administration

Problems related to the content:-

- What is the meaning of the term Administration?
- Can we consider management and Administration as the two sides of the same coin?
- Is there any difference between management and Administration?

Objectives

- Understand the meaning of Administration
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- Identify that some thinkers consider management and Administration as the two sides of the same coin
- Differentiate Management and administration on the basis of the thought of some management thinkers

Sub Unit 1.4: Levels of Management

Problems related to the content
- What are the different levels of management?
- Give examples for the Employees who is included in each levels.
- Draw a chart which depicts the different levels of management
- What are the different functions performed by each level?

Objectives
- Understand the different levels of management.
- Identify the employers which are included in different levels.
- Know to arrange the job positions on the basis of different levels of management.
- Identify the different functions performed by each level.

Sub Unit 1.5: Functions of management

Problems related to the content
- What is POSDCORB?
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- What do you mean by the process of management?
- What are the elements of management?

Objectives

- Identify the elements in POSDCORB
- Understand the process of management.
- Understand the various elements of management.

Sub Unit 1.6: Co-ordination, elements and importance.

Problems related to the content

- What is co-ordination?
- What is the relevance of co-ordination in business?
- What are the elements of co-ordination?

Objectives

- Understand the meaning of co-ordination.
- Understand the relevance of co-ordination.
- Identify the elements of co-ordination.

Unit -2. Principles of Management

Sub unit 2.1: Principles of management-meaning, nature and importance
Problems related to the content:

- What is the meaning of principles of management?
- What is the importance of principles of management?
- What are the characteristics of principles of management?
- What obstruct in the proper utilizing of resources?

Objectives:-

- Understand the meaning of principles of management.
- Recognise the importance of management principles.
- Identify the characteristics of principles of management.
- Find out the obstacles in the proper utilization of resources and application of management principles.

Sub Unit 2.2: Fayol’s Principles of management

Problems related to the content:-

- What are the problems faced in management function?
- What are the fourteen management principles of Fayol?
- How management principles are applied against each problem?
- What is the result after the application of Management principles?
Objectives:-

- Find out the problems faced in management function
- Get an idea about the 14 management principles by Fayol
- Applying management principles towards each problem.
- Recognise the results after applying management principles.

Sub Unit 2.3: Scientific management meaning and principles

Problems related to the content:-

- What is the importance of employee’s suggestions in the working of a company?
- Is there any need to scientific selection and training to the workers?
- What is the importance of Division of work and supervision among workers?
- What is the meaning of scientific management?
- What are the scientific management principles by F. W Taylor?

Objectives:-

- Identify the importance of suggestions of employee in the working of a company.
- Understand the need for scientific selection and training of workers.
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- Identify the importance of Division of work and supervision among workers.

- Recognize the meaning of scientific management

- Get an idea about the scientific management principles of F.W Taylor.

Sub Unit 2.4: Techniques of scientific management

Problems related to the content:-

- Is there any importance of assigning task to the factory workers?

- How can the management avoid unnecessary movement of men and materials inside the factory?

- What is Differential Piece wage system?

Objectives:-

- Identify the importance of assigning task to workers

- Identify the various components of work study

- Recognise the meaning of differential piece wage system

Step 4: Designing the Strategy

In this step, the investigator designed the phases of the strategy based on Experiential learning for enhancing Leadership quality, Business interest and Achievement in commerce of Higher Secondary XII school
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students. There are seven phases in the transaction of a lesson according to the strategy and they are given below:

Phase 1. Preparation
Phase 2. Presentation
Phase 3. Interaction
Phase 4. Internalisation
Phase 5. Knowledge Construction
Phase 6. Application
Phase 7. Review

Fig 4.2 Phases of the developed strategy

The description of the phases is given below:-
Phase 1: Preparation

Preparation is the basic stage for introducing any activity. Effective preparation provides better outputs in the future stage. Systematic and careful planning will reflect in the entire process of preparation. In this phase, the teacher provides an interesting activity for familiarising the targeted task or unit. For this teacher ask certain questions about the already learnt topic.

Phase 2: Presentation

Presentation is the most valuable process in an activity. Effective presentation can make better results in the later stage. In this phase, the teacher provides better possibilities to familiarise already designed tasks. Here teacher presents the targeted task in an effective manner. It may be in the form of a Handout or in the form of Power Point Presentation and Video clips etc.

Phase 3: Interaction

Interaction stage is another important stage in dealing with Experiential learning. The real impact of the learner can be obtained at this stage. The response rate of the learners will reflect their power of grasping the targeted input. After the presentation, the teacher provides opportunities for better interaction. Class room interaction is a two way process between the teacher and students. Here the teacher provides more
coverage to clear the doubts of the learner and encourage the learners in the way of better enrichment.

**Phase 4: Internalisation**

Internalisation is the process in which the learner attains the targeted objectives of the task. After better interaction the teacher provides better clarifications, additions, subtraction and modifications of the targeted goal. Internalisation can be tested through asking thought provoking questions, it can also be charged through interpersonal and intra personal communicative situation.

**Phase 5: Knowledge construction**

After the internalisation of the targeted learning experiences, the students consult their own knowledge about the task with teacher. In this phase each learner should go through the targeted task and make attempts of their own way for constructing knowledge. The process of construction can be charged with proper guidance.

**Phase 6: Application**

Application of the acquired knowledge is really a challenging task. A comprehensive effort is required from the part of the learner to perform this task efficiently. While applying knowledge the learner should go deep into various levels of acquisition. It is the real ways of testing, how far the learner acquired progress in the entire teaching learning activity. After
acquiring knowledge the teacher provide a new task for applying the already acquired knowledge in a new situation.

**Phase 7: Review**

In this phase, the teacher explore the possibilities of better reviewing techniques.

**Follow up activity**

After concluding the topic the teacher assigned some task to the students. It enables the learner to collect additional information with regard to the area under study and collect new information and utilize them for better understanding.

**Step 5 Developing Lesson format**

A lesson plan is an organized statement of general and specific educational goals together with the specific means by which these goals are to be attained by the learners under the guidance of the teacher on a given day. It is a written version of short excerpts of classroom discourse. The model lesson format based on the developed strategy for enhancing leadership quality, business interest and achievement in commerce of students at Higher Secondary level is given as below.
Model Lesson Format based on Developed Experiential Learning Strategy

Name of the Teacher: Date:
Name of the School: Standard:
Name of the Subject: Strength:
Name of the Unit: Nature and significance of management Period:
Name of the Topic: Communication Duration: 45 Minutes

Content overview: Communication meaning and components
Curriculum objective: 1. Acquire meaning of communication
2. To identify various elements or components of Communication

Content Analysis

i. Terms: Communication, Sender, Message, Channel, Response, Encoding, Decoding

ii. Concept: Communication is the exchange of ideas between two or more person. There are generally six components of communication

iii. Learning Strategy: Group discussion, General discussion

iv. Learning materials: Usual classroom aids, Pictures

Previous knowledge: Communication is one of the elements of direction. Directing is the function of management.
<table>
<thead>
<tr>
<th>Phases</th>
<th>Activity</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Teacher wishes the students good morning students. Are you ready to start the class. The teachers divided the class into four groups and give them four pieces of paper containing different pictures and ask each group to present the topic given in picture.</td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>Group 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group 2</td>
<td></td>
</tr>
</tbody>
</table>
Each of the group presented their topics. Then the teacher introduced the topic communication, as the process of exchanging information and understanding between two or more parties.

Teacher shows all the pictures and asks the students, that what are the basic elements of communication process or which are the elements included in a process of communication?

Then the teachers explain the various elements in communication process as sender, message, receiver, channel and response. Then the teacher asks the group to write down various elements involved in the picture of communication.

The students actively participate in the interaction and understand the meaning of communication.
Knowledge construction

The teachers ask the group to differentiate the elements in the four different pictures.
### Application

Here the message, sender, receiver, response and channel are different.

Each group presents their viewpoints and teaches concluded the topic by giving an explanation:

- **Message**: Subject matter of communication
- **Sender**: Communicator, who sends the message
- **Receiver**: The persons who sends the message
- **Response**: The feedback from receiver
- **Channel**: the mode in which communication is processed

Decoding: Translating the message for the purpose of understanding

Encoding: The sender translates the message

The teacher repeated the meaning and elements of Communication.

### Follow up activity

Give an assignment on modes of communication

The students understand different elements of communication.

### Review

The students recognise the meaning and elements of communication.

### Step 6 Tryout of the Developed strategy

Here the developed strategy was applied among Higher Secondary school students of standard XII. The investigator selected a class of standard
XII from two schools in Pathanamthitta district and taught them four lessons, one topic each from each unit through the developed strategy. On the basis of the feedback, some modifications were made.

**Step 7 Evaluating the strategy**

The developed strategy was evaluated by commerce teachers who were present at the class during the tryout of the developed strategy. Along with this, the investigator himself approached some commerce teachers of various Higher Secondary schools of Pathanamthitta District and gave them a demonstration of the developed strategy. The teachers are requested to use this strategy which they are taking classes in standard XII. After two weeks the investigator gave them a strategy appraisal questionnaire for evaluating the developed strategy.

**Strategy appraisal questionnaire for teachers**

A strategy appraisal questionnaire was prepared for collecting the feedback regarding the developed strategy based on Experiential learning. It consists of 12 statements selected from an initial pool of 20 statements regarding the objectives, content and learning experience provided by the strategy. The respondents have to write down their opinion in Yes or No format. For validation, the questionnaire was given to the same team of experts who validated the strategy under study. The responses to the
questionnaire prepared for this purpose were subjected to percentage analysis and the results are given in the table below.

Table 4.3

*Response of commerce teachers collected through strategy appraisal questionnaire for teachers*

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Statements</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you think that this strategy will make Commerce teaching more interesting?</td>
<td>85 15</td>
</tr>
<tr>
<td>2</td>
<td>Does the strategy help to make better Classroom interaction?</td>
<td>90 10</td>
</tr>
<tr>
<td>3</td>
<td>Does the strategy help to develop leadership qualities among students?</td>
<td>80 20</td>
</tr>
<tr>
<td>4</td>
<td>Does the strategy help to develop business interest among students?</td>
<td>75 25</td>
</tr>
<tr>
<td>5</td>
<td>Does Self evaluation possible under this strategy?</td>
<td>82 18</td>
</tr>
<tr>
<td>6</td>
<td>Is this strategy feasible in your school settings?</td>
<td>80 20</td>
</tr>
<tr>
<td>7</td>
<td>Do students acquire knowledge independently through this strategy?</td>
<td>75 25</td>
</tr>
<tr>
<td>8</td>
<td>Do you think that by learning through this Strategy, learned concepts will be retained for a longer period?</td>
<td>78 22</td>
</tr>
<tr>
<td>9</td>
<td>Does this strategy give quick feedback from the students?</td>
<td>75 25</td>
</tr>
<tr>
<td>10</td>
<td>Do you think classroom activities are time bound in this strategy?</td>
<td>80 20</td>
</tr>
<tr>
<td>11</td>
<td>Does this strategy develop specific skills among students?</td>
<td>85 15</td>
</tr>
<tr>
<td>12</td>
<td>Do you think that students are motivated by this strategy?</td>
<td>80 20</td>
</tr>
</tbody>
</table>

85% of the commerce teachers believed that the strategy is more interesting. 90% of the teachers believed that this strategy made a better
classroom interaction. 80% found that this strategy helps to develop leadership quality and 75% found that it will develop business interest among students. 82% said that self evaluation is possible. 80% agreed that this strategy is feasible in their school settings. 75% believed that their students acquired knowledge independently. 78% of the teachers reported that this strategy helps to retain the learned concepts for a longer period. 75% of the teachers said that they got quick feedback from students. 80% of the teachers agreed that the classroom activities are time bound in this strategy. 85% of the teacher concluded that this strategy will develop specific skills among students. 80% of the teachers believed that this strategy will motivate the students.

4.4.2.7 Preparation of Lesson Transcripts on Developed Strategy based on Experiential Learning

For preparing the lesson transcripts, the units selected were, “Nature and significance of management”, “Principles of management”, “Planning” and “organising” from Standard XII Commerce syllabus of Kerala. The investigator conducted a careful pedagogic analysis of these units and identified the facts, concepts, principles, theories to be developed. On the basis of the tryout, experiences of the investigator and suggestions obtained from teachers and experts, 15 lesson transcripts were prepared based on the Developed Strategy. For validation of these lesson transcripts
prepared for Standard XII, they were given to some experts in the field of teacher education as well as Commerce education. Based on their comments and suggestions, the investigator modified them. Thus lesson transcripts on Developed Strategy based on Experiential learning from Commerce topics of Standard XII were prepared. Sample lesson transcripts are given as Appendices II A & B.

4.4.3 Lesson Transcripts based on Existing Activity Oriented Method

Fifteen lesson transcripts were also prepared based on the Activity Oriented Method, which is currently practiced in the higher secondary schools of Kerala. Lesson transcripts for the same contents- “Nature and significance of management” and “Principles of management, Planning and Organising” - were prepared based on the existing Activity oriented method. Fifteen lesson transcripts were prepared with each lesson having 45 minutes duration. The lesson transcripts were prepared by taking into account the curricular objectives, the mental process etc. During the class, sufficient explanations were given regarding the facts, concepts, principles, rules etc. Appropriate learning activities were used to transact the content area with sufficient use of learning aids. Sample lesson transcripts based on Existing Activity Oriented Method are given as Appendices III- A and III B.
4.4.4 Leadership Quality scale

“Leadership is a process whereby intentional influence is exerted by one person over others in order to guide, structure and facilitate organisational activities and relationships” (Yukl, 2002, p. 7). After reviewing various books, journals, etc. related on leadership quality, the investigator constructed the leadership quality scale to assess the leadership quality among higher secondary commerce students. The researcher selected 9 components of leadership quality for preparing items for leadership quality scale. The identified components are:-

1. Self confidence
2. Assertiveness
3. Emotional stability
4. Task orientation
5. Sincerity
6. High tolerance
7. Co-operation
8. Managing ability
9. Motivation
4.4.4.1 Preparation of the draft form of Leadership Quality Scale

Based on the components identified the investigator prepared 60 items. The investigator adopted Likert method to construct Leadership quality Scale. The items were prepared in the form of statements with five ratings—Always, Most of the time, Sometimes, Seldom and Never.

Students were asked to mark their responses according to their attitude as per instructions. The answer scripts were collected and the scores were calculated according to the table given below.
Table 4.4
Scores given to various response of the Leadership Quality Scale

<table>
<thead>
<tr>
<th>Response</th>
<th>Response Letter</th>
<th>Scores for positive statement</th>
<th>Scores for negative statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>A</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Most of the time</td>
<td>B</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>C</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Seldom</td>
<td>D</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>E</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Proper instructions were given to the students. The scale was administered to 370 students studying in standard XII in the higher secondary Schools mentioned in table 4.5. The test forms were given to the students and they were asked to write alphabets corresponding to each item in the appropriate space provided. After collecting back the test booklets, the scoring was made. The Malayalam and English versions of the draft form of Leadership quality scale given as appendix IV A & IV B. The response sheet (Draft) of the leadership quality scale is given as appendix IV C.
Table 4.5

_Distribution of the sample for tryout of Leadership Quality Scale_

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the School</th>
<th>Type of Management</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. Girls H.S.S Adoor</td>
<td>Govt</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>M.G.M. H.S.S, Thumpamon</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Govt.H.S.S, Omalloor</td>
<td>Govt</td>
<td>54</td>
</tr>
<tr>
<td>4</td>
<td>N.S.S H.S.S, Choorakodu</td>
<td>Aided</td>
<td>55</td>
</tr>
<tr>
<td>5</td>
<td>Govt.H.S.S, Thumpamon North</td>
<td>Govt</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>N.S.S. H.S.S , Thattayil</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>Govt. H.S.S , Thottakonam</td>
<td>Govt</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>370</strong></td>
</tr>
</tbody>
</table>

**Item Analysis**

Item analysis is a technique for determining the quality of each item. For item analysis, the procedure suggested by Edward (1950) was used. The response sheets of 370 students were arranged in descending order of total scores. The response sheets of highest 27 percent and lowest 27 percent were used as extreme groups for item analysis.

4.4.4.2 Preparation of Final form of Leadership Quality Scale

For the preparation of final form of leadership quality scale, the items having ‘t’ value equal or above 1.75 were selected, as the ‘t’ value is
a measure of the extent to which a given statement differentiate between the high and low groups. Edwards (1957) opined that “as a crude and approximate rule of thumb, we may regard any ‘t’ value equal to or greater than 1.75 as indicating that the average response of the high and low groups to a statements differs significantly”. After computing the ‘t’ value, 40 items were selected. Thus the final form of the Leadership Quality Scale with 40 items was prepared.

**Screening of the statements**

The draft items were given to experts to evaluate the content accuracy, coverage and for addition, deletion or modification of the items. Items from the initial draft were selected on the basis of expert suggestions. Thus there were 60 items in the draft and 40 items on the final scale.

**Scoring procedure**

Corresponding to each statements, five options are given to write the responses regarding the leadership Quality Scale as A,B,C,D and E from which the subject has to select the option which reflects his/ her opinion. The ‘t’ value for each statement are also given as appendix IV D. The Malayalam and English versions of the final form of Leadership Quality Scale are given as Appendix IV E & IV F. The copy of the Response sheet (FInal) is given as Appendix IV- G.
Table 4.6

Component wise distribution of items

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Components</th>
<th>Questions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Self confidence</td>
<td>6,8,13,17,18,31,32,43,45,50</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Assertiveness</td>
<td>1,14,40</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Emotional stability</td>
<td>4,5,29,30</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Task orientation</td>
<td>11,12,28,33</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Sincerity</td>
<td>10,15,20,25,34,47,</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>High tolerance</td>
<td>19,22,23,21</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Co-operation</td>
<td>16,26,27,35,38,42,46</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Managing Ability</td>
<td>3,37,39,48,49</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Motivation</td>
<td>2,7,9,24,36,41,44</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

Determination of validity

Content validity is the validity of a test determined against the course content. Content validity refers to the degree which the test actually measures, or is specifically related to the traits for which it was designed. Content validity is based upon careful examination of standard textbooks, objectives and the judgments of subject matter specialists. The criterion of content validity is often assessed by a panel of experts in the field who judge its adequacy but there is no numerical way to express it. The
prepared Leadership quality Scale was given to a set of experts to determine its content validity.

**Determination of Reliability**

Reliability is the term technically defined as the extent to errors of measurement instrument. In lay terms, this means the extent to which a test is dependable, stable and consistent, when given to different people and or administered on different occasion (International Dictionary of Education, 1977).

The reliability of the leadership quality scale was found by split half method. The scale was divided into two equivalent comparable halves, and each half was considered as a separate test. The odd items and even items were considered separately to develop the half tests. The reliability of half test was calculated by Karl Pearson’s product moment. Spilt half reliability was found to be 0.423. This shows that the prepared scale has high reliability.

**4.4.5 Business interest inventory**

Inventory is a list, record or catalog containing list of traits, preferences, attitudes, interests or abilities used to evaluate personal characteristics or skills. An interest inventory is a self assessment tool, used in career planning that assesses one's likes and dislikes of a variety of
activities, objects, and types of persons; the premise is that people in the same career have similar interests.

Business interest inventory is used to measure the interest of students in business studies and business. In this study the investigator developed a business interest inventory to measure the student’s business interest. Instruments and procedure items for the business interest inventory were developed based on a current literature review of both situational and individual interest. It was found that a person with business interest will have the following preferences.

1. Learning Ability
2. Subject competency
3. Practicability
4. Market awareness
5. Economic reforms
6. Social obligation
7. Creativity
The procedure adopted by the investigator in preparing Business Interest Inventory is described in the following section.

4.4.5.1 Preparation of draft form of Business Interest Inventory

After discussion with experts in the field of commerce and education, the investigator prepared the draft form of Business Interest Inventory containing 50 statements. It was then again given to a group of experts for comments and suggestions. As per the comments and suggestions received, some of the statements were deleted and others were modified. Thus the draft form of Business Interest Inventory consisted of 45 items. Each item is to measure the Business interest of the students.
These 45 statements were arranged randomly. The five possible responses were,

a. Always
b. Most of the Time
c. Sometimes
d. Seldom
e. Never

Corresponding to each statement, space is given to write the responses regarding the Business interest as A, B, C, D and E. The Malayalam and English versions of the draft Business interest inventory are given as Appendices V-A & V-B and its response sheet is given as Appendix V-C.

Table 4.7
Scores given to various response of the Business Interest

<table>
<thead>
<tr>
<th>Response</th>
<th>Response Letter</th>
<th>Scores for positive Statement</th>
<th>Scores for negative statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>A</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Most of the time</td>
<td>B</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>C</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Seldom</td>
<td>D</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>E</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
Methodology

Procedure for administering and scoring of the draft form of Business Interest Inventory

The draft form of Business Interest Inventory was a self-administering one. Instruction to the students was given in the draft inventory. The inventory was administered to 370 students studying in standard XII in the Higher Secondary Schools mentioned in Table 4.8. The test forms were given to the students and they were asked to write alphabets corresponding to each response in the appropriate space provided. After collecting back the test booklets, the scoring was made. The scores of all the items were summated to obtain the business interest inventory score of an individual.

Table 4.8

Distribution of the sample for tryout of the Business Interest Inventory

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the School</th>
<th>Type of Management</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. Girls H.S.S, Adoor</td>
<td>Govt</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>M.G.M. H.S.S, Thumpamon</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Govt. H.S.S, Omalloor</td>
<td>Govt</td>
<td>54</td>
</tr>
<tr>
<td>4</td>
<td>N.S.S H.S.S, Choorakodu</td>
<td>Aided</td>
<td>55</td>
</tr>
<tr>
<td>5</td>
<td>Govt. H.S.S, Thumpamon North</td>
<td>Govt</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>N.S.S. H.S.S, Thattayil</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>Govt. H.S.S, Thottakonam</td>
<td>Govt</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>370</strong></td>
</tr>
</tbody>
</table>
Item Analysis

It is the process of establishing the suitability of an item for inclusion in the final inventory. The quality of each item was ascertained by analyzing the important characteristic of the item, namely the Discriminating power. In item analysis 45 items were selected for the draft form of Business Interest Inventory. The response sheets of 370 students were arranged in descending order of total scores. The response sheets of highest 27 percent and lowest 27 percent used as extreme groups for item analysis. According to Ebel & Frisbie (1996), “27 percent provides the best compromise between two desirable and in consistent aims to make extreme groups as different as possible”. The scores obtained for each item in these extreme groups were used for calculating the discriminating power of each item. The discriminating power was obtained by calculating the ‘t’ value.

4.4.5.2 Preparation of Final Business Interest Inventory

For the preparation of final Business Interest Inventory, the items having ‘t’ value equal or above 1.75 were selected. After computing the ‘t’ value, the best 40 items were selected out of 50 items. Hence the final form of the Business Interest Inventory with 40 items was prepared. The final form of Business Interest Inventory (Malayalam) and its English version are given as Appendices V- E & F. The ‘t’ value for each statement are also given as Appendix V D
Table 4.9

**Component wise distribution of items of final form of Business Interest Inventory**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Components</th>
<th>Questions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learning Ability</td>
<td>3,4,5,8,9,11,16,</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Subject Competency</td>
<td>1,2,6,10,13,14,27,28,39</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Practicability</td>
<td>7,21,22,23</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Market Awareness</td>
<td>15,17,18,20,26,29,33</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Economic Reforms</td>
<td>25,34,38</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Social Obligation</td>
<td>35,36,37,40</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Creativity</td>
<td>12,19,24,30,31,32</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

**Validity**

A test is valid if it measures what it claims to measure. Gronlund (1981) stated that “validity refers to the extent to which the results of a test procedure serve the particular uses for which they are intended.”

**Content Validity**

This implies a process of matching the test items with the objectives. The prepared Business Interest Inventory was given to a set of experts to determine its Content Validity and their comments assured good content validity.
Concurrent validity

The process of correlating test scores with another set of criterion scores. It is a highly appropriate means of validating instruments used for assessment of current attributes.

Reliability

The reliability of the Business Interest Inventory was found by split half method. The reliability of half test was calculated by Karl Pearson’s product moment. Spilt half reliability found to be 0.742. This shows that the Business Interest Inventory has high reliability.

4.4.6 Achievement test in Commerce

Achievement test is an instrument that measures the current status of individuals with respect to proficiency in given areas of knowledge or skill (Gay, 1990).

Since the aim of this study was to develop a strategy based on Experiential learning for enhancing Leadership quality, Business interest and Achievement in commerce at higher secondary school level, the investigator selected the business studies units named “Nature and significance of management” and “Principles of management, Planning and Organizing” of Standard XII. The items were prepared keeping in mind the Taxonomy of Educational Objectives given by Bloom (1956). Along with the fixing up of objectives, the type of questions to be included
in the draft test was determined. Keeping in view of the judged superiority of objective type items, the investigator decided to construct an objective type achievement test. The highly regarded and widely used form of objective test is multiple choice types which is the most flexible and most effective item type. The procedure applied for the preparation and standardization of this test is given below.

4.4.6.1 Preparation of the Draft Achievement Test in Commerce

The investigator thoroughly analysed the contents of the units selected and divided it into four sub units as given in the Table below.

Table 4.10

*Contents on each subunits of Business Studies*

<table>
<thead>
<tr>
<th>Sub unit</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub unit 1</td>
<td>Nature and significance of management</td>
</tr>
<tr>
<td>Sub unit 2</td>
<td>Principles of management</td>
</tr>
<tr>
<td>Sub unit 3</td>
<td>Planning</td>
</tr>
<tr>
<td>Sub unit 4</td>
<td>Organising</td>
</tr>
</tbody>
</table>

The test construction demands vast experiences in the field. Therefore with the support and help of experts and experienced teachers in the field, the investigator was able to prepare the achievement test with multiple- choice items from the selected content. According to Ebel and Frisbie (1991), “Multiple Choice items are adaptable to the measurement
of most important educational outcomes of knowledge, understanding and
cJudgement of ability to solve problems, to recommend appropriate action,
to make predictions”. Keeping this in view, the investigator selected
objective type multiple-choice test items only.

A draft test consisting of 60 multiple choice items was prepared
with necessary instructions on the first page. The items were arranged
according to their increasing order of difficulty. Most of the items were
intended for average students, but neither the gifted nor the dull was
ignored. A copy of the draft test is given as Appendices VI-A. The
response sheet of draft test is also provided as Appendices VI-B and its
answer key as VI-C

**Try out**

The tryout of the draft form of the Achievement test was
administered on a final sample of 370 students of standard XII selected by
random sampling procedure. Prior arrangements were made with the
authorities for the proper conduct of the test, under satisfactory
examination conditions. The investigator tried to maintain similar
conditions, especially regarding the instructions given to the examinees,
time taken etc. The scoring was done according to the scoring key prepared
for this purpose. Sample split up for the tryout is given in table 4.11.
Table 4.11

Breakup of the sample for the Tryout of Achievement test in Commerce

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the School</th>
<th>Type of Management</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. Girls H.S.S, Adoor</td>
<td>Govt</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>M.G.M. H.S.S, Thumpamon</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Govt. H.S.S, Omalloor</td>
<td>Govt</td>
<td>54</td>
</tr>
<tr>
<td>4</td>
<td>N.S.S H.S.S, Choorakodu</td>
<td>Aided</td>
<td>55</td>
</tr>
<tr>
<td>5</td>
<td>Govt. H.S.S, Thumpamon North</td>
<td>Govt</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>N.S.S. H.S.S, Thattayil</td>
<td>Aided</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>Govt. H.S.S, Thottakonam</td>
<td>Govt</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>370</strong></td>
</tr>
</tbody>
</table>

**Item analysis**

Item analysis refers to the application of statistical techniques to assess two characteristics of items, their difficulty and the extent to which they are correlated with other measures (Wood, 1960, p.81). 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 analysing two important characteristics of item, namely

1. Difficulty index
2. Discriminating Power
Based on the scores obtained, response sheets of the students were arranged in descending order from highest to the lowest. The responses of the top scoring 27 percent and the bottom scoring 27 percent were used for item analysis. For the present study the procedure and formula suggested by Ebel & Frisbie (1991) were used to calculate the difficulty index and discriminating power.

Index of the difficulty

\[ DI = \frac{U + L}{2N} \]

Index of discriminating power

\[ DP = \frac{U - L}{N} \]

U= Number of correct responses in the upper group
L= Number of correct responses in the lower group
N=Number of pupils in each group

In the present study, items having difficulty index between 0.25 and 0.70 and discriminating power above 0.30 were considered. The details regarding the difficulty index and discriminating power are given as Appendices VI- D

4.4.6.2 Preparation of the final test

After item analysis, the investigator selected 40 items for the final test. A design and a blueprint for the test was prepared and due weightage was given to different objectives. The weightage given to objectives,
content, difficulty level and the details regarding blueprint are shown below.

**Weightage given to objectives**

The categories of objectives selected for the preparation of the achievement test were Knowledge, Understanding, Application, Application, Analysis, Synthesis and Evaluation. The details of weightage given to these objectives are given in the table below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Objectives</th>
<th>Score</th>
<th>No. of questions</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge</td>
<td>9</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>2</td>
<td>Understanding</td>
<td>9</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>3</td>
<td>Application</td>
<td>6</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Analysis</td>
<td>6</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Synthesis</td>
<td>5</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>6</td>
<td>Evaluation</td>
<td>5</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>40</strong></td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**Weightage given to content**

When the test was prepared, due weightage was given to each subunit of the content. The whole selected area of the content was divided into
4 sub units. A detailed description of the weightage given to each subunit is shown in the table given below.

Table 4.13

Weightage given to content

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subunit</th>
<th>Marks</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nature and significance of management</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>2</td>
<td>Principles of management</td>
<td>15</td>
<td>37.5</td>
</tr>
<tr>
<td>3</td>
<td>Planning</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Organising</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Weightage given to Difficulty level

The investigator constructed the achievement test by including items by considering bright, average and dull students. The weightage given to difficulty level is given below:

Table 4.14

Weightage given to Difficulty level

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Difficulty level</th>
<th>Marks</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Easy</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>23</td>
<td>57.5</td>
</tr>
<tr>
<td>3</td>
<td>Difficult</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>
Blueprint

The investigator prepared blue print before preparing the final test.

The blue print is given in table below.

Table 4.15

Blueprint

<table>
<thead>
<tr>
<th>No. of questions</th>
<th>Knowledge</th>
<th>Understanding</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub Unit 1</td>
<td>1 (1)</td>
<td>1 (2)</td>
<td>1 (1)</td>
<td>1 (1)</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>9</td>
</tr>
<tr>
<td>Sub Unit 2</td>
<td>1 (5)</td>
<td>1 (5)</td>
<td>1 (1)</td>
<td>1 (3)</td>
<td>1 (1)</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Sub Unit 3</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>1 (1)</td>
<td>1 (1)</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Sub Unit 4</td>
<td>1 (1)</td>
<td>1 (3)</td>
<td>1 (2)</td>
<td>1 (1)</td>
<td>1 (3)</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>40</td>
</tr>
</tbody>
</table>

Number inside the brackets indicates the number of questions and the number outside the bracket indicates marks.
Scoring

Scoring was done as per the scoring key prepared for this purpose. For every right answer score one was provided. The total number of right answers gives the total score. The copy of the final form of the achievement test is given as Appendix VI E. The response sheet of the final form of the test is given as Appendix VI F and its scoring key as Appendix VI G.

Validity

Validity is that quality of a data gathering instructions that enable to measure what it is supposed to measure. So the investigator tried to measure content validity and concurrent validity.

Content validity

Before preparing the test, the investigator thoroughly analysed the content area and adequate weightage was given to the content as well as instructional objectives. Opinion of the experts and teachers in this field were also collected for preparing the test. Also the investigator used standard text books for preparing the items. These all ensured content validity of the test.
Concurrent Validity

The investigator found out the coefficient of Correlation between the scores obtained using the achievement test and the First terminal examination in commerce of the students. It was found to be 0.86. This value shows that the test has good concurrent validity.

Reliability of the Test

The reliability refers to the consistency with which a test measures, what it intends to measure. The investigator used test-retest method to find out the reliability of the test. The tool was administered and repeated after a time interval of two weeks. Co-efficient of correlation was computed between the first and second set of scores. The reliability was found to be 0.83. this shows that the test has high reliability.

4.4.7 Raven’s Standard Progressive Matrices

Raven’s progressive Matrices (1938, 2003) are widely used type of non verbal intelligence tests. The standard Progressive Matrices (SPM) was designed to measure a person’s ability to form perceptual relations and to reason by analogy independent of language and formal schooling and may be used with person ranging in age from 6 years to adult. The matrices measure two complementary components of general intelligence: the ability to think clearly and make sense of complex data, which is known as educative ability; and the ability to store and reproduce information,
known as reproductive ability. It is the first and most widely used of the instruments known as the Raven’s Progressive Matrices. Taking into consideration the opinions of the experts in this field, the investigator decided to use Raven’s Standard Progressive Matrices to measure the general mental ability.

4.4.7.1 Scoring

Raven’s progressive Matrices are multiple choice tests of abstract reasoning. It is published in 1938 and is a non-verbal test administered to measure a person’s capacity to apprehend meaningless figures presented for observation, see the relation between them, conceive the nature of the figure, completing each system of relations presented and so develop a systematic method of reasoning. The (SPM) consists of 60 items arranged in five sets (A, B, C, D & E) of 12 items each. Each item contains a figure, only one of which is correct. Each set involves a different principle or ‘theme’ for obtaining the missing piece, and within a set the items are roughly arranged in increasing order of difficulty. All items are presented in black ink on a white background. In each set, the first problem is the easiest one and the consecutive problems became gradually difficult.

4.4.7.2 Reliability

Test-retest correlations range from a low of 0.46 for an eleven-year interval to a high of 0.97 for a two-day interval. The median test-re-test
value is approximately 0.82. Coefficients close to this median value have been obtained with time intervals of two week to several weeks, with longer intervals associated with smaller values. Raven provided test-retest coefficient for the group as 0.88.

4.4.7.3 Validity

The majority of students which have factor analysed the SPM along with other cognitive tests. Concurrent validity coefficients between the SPM and the Stanford-Binet and Weschler scales range between 0.54 and 0.88, with the majority in the 0.70s and 0.80s.

4.4.7.4 Norms

Norm groups included in the manual are: British children between the ages of 6 and 16; Irish children between the ages of 6 and 12; military and civilian subjects between the ages of 20 and 65.

4.4.7.5 Marking procedure

A student’s score on the scale is the total number of problems solved correctly when allowed to work quickly through the series from the beginning to the end. The total score provides an idea of his intellectual capacity. To record the answers, a record form is available with the Booklets of SPM. A copy of the Scoring card of the Raven’s Standard Progressive Matrices is given as Appendix- VII.
4.5 Procedure adopted for experimentation

The present study was intended to develop a strategy based on Experiential learning for enhancing leadership quality, business interest and achievement in commerce of students at higher secondary level. Before developing the strategy, the investigator contacted teachers handling Commerce (business studies) at Higher Secondary level and found the difficulties experienced by them in transacting this subject. The investigator decided to select students of standard XII as the sample of the study. The investigator approached the principals of the schools in advance and explained the purpose and nature of the study and sought their permission to conduct the experiment.

After analysing the theoretical constructs of Leadership quality and Business interest, the investigator prepared and standardized Leadership quality scale and Business interest inventory. Achievement test in the commerce topics selected was also prepared and standardized. Lesson transcripts based on the developed strategy and existing Activity oriented method were also prepared.

After comparing the previous Achievement in commerce and General Mental Ability of students belonging to Standard XII, the students in one division of each school was considered as the experimental group and the other division as control group. Then the achievement test,
Leadership Quality Scale, Business Interest Inventory were administered as pre-tests in both the experimental and control groups. The rules and procedures prescribed for each type of test were strictly followed. The response sheets were collected back after the allotted time.

Then the investigator conducted classes using the developed strategy based on experiential learning in the experimental group and classes based on Existing activity oriented method in the control group. 15 lesson transcripts in each method were prepared and used. Each lesson transcript was used in a period of 40 minutes duration. The same topics were taught in both the groups. After the completion of experimental treatment, achievement test in commerce, leadership quality scale and business interest inventory were again administered as post-tests to both the groups. One month after the administration of the post tests, the achievement test in commerce was again administered to both groups to assess the retention of achievement in commerce. For this, the investigator used the same achievement test in commerce but the questions were rearranged and the order and wording were slightly changed. The scores obtained were then analyzed statistically.
4.6 Statistical Techniques used for Analysis of Data

In the present study, the relevant data obtained from the pre-test and post-test of both experimental and control group students have been analyzed using appropriate statistical techniques.

1) Arithmetic Mean (M)

Mean is defined as the sum of all the values of items in a series divided by the number of items.

\[ M = \frac{\sum fx}{N} \]

Where,  
\( f \) = Frequency of the class interval
\( x \) = Mid point of the class
\( N \) = Sum of frequencies

2) Standard Deviation (SD)

Standard deviation is the square root of the average of the squares of the deviations of each score from the mean.

\[ SD = \sqrt{\frac{\sum f x^2}{N}} \]

Where,  
\( f \) = Frequency
\( x = x_i - \bar{x} \),

Where;  
\( x_i \) = Mid value of the class interval
\( \bar{x} = \text{Arithmetic Mean} \)

\( N = \text{Total frequency} \)

3) **Standard Error** \((S_{ED})\)

The standard error of the difference between the two sample means is calculated to discover whether two groups differ significantly in mean performance.

\[
S_{ED} = \sqrt{\frac{\sigma^2_1}{N_1} + \frac{\sigma^2_2}{N_2}}
\]

Where,

\( \sigma_1, \sigma_2 = \text{Standard deviation of the two groups} \)

\( N_1, N_2 = \text{Size of the two samples} \)

\( S_{ED} = \text{Standard error of difference between means.} \)

4) **Critical Ratio** \((R)\)

\[
CR = \frac{M_1 - M_2}{S_{ED}}
\]

\( M_1 = \text{Mean of the first sample} \)

\( M_2 = \text{Mean of the second sample} \)

\( S_{ED} = \text{Standard error of the difference between means.} \)

5) **Analysis of Co-variance** \((\text{ANCOVA})\)

The analysis of covariance (ANCOVA) is a powerful statistical tool for test of significance. "Through covariance analysis one is able to effect
adjustments in final or terminal scores which will allow for differences in some initial variable” (Garrett, 1981). The main objective of analysis of co-variance technique is to examine if there is significant difference between the class means in view of the variability within the separate classes.

Let scores of the subjects of the experimental and control groups on pre-test be denoted by \(x_1\) and \(x_2\) those on the Post-test as \(y_1\) and \(y_2\) respectively. \(N_1\) and \(N_2\) denote the total number of subjects in experimental and control groups respectively. Then

\[
\sum x_1 - \text{Sum of the scores on Pre-test obtained by the subjects of the experimental group.}
\]

\[
\sum x_2 - \text{Sum of the scores on Pre-test obtained by the subjects of the control group.}
\]

\[
\sum x = \sum x_1 + \sum x_2
\]

\[
\sum x_i^2 - \text{Sum of the squares of the scores on Pre-test obtained by the subjects of the experimental group.}
\]

\[
\sum x_2^2 - \text{Sum of the squares of the scores on Pre-test obtained by the subjects of the control group.}
\]

\[
\sum x^2 = \sum x_1^2 + \sum x_2^2
\]
\[ \sum y_1 \] - Sum of the scores on Post test obtained by the subject of the experimental group.

\[ \sum y_2 \] - Sum of the scores on Post test obtained by the subject of the control group.

\[ \sum y = \sum y_1 + \sum y_2 \]

\[ \sum y_1^2 \] - Sum of the squares of the scores on Post-test obtained by the subjects of the experimental group.

\[ \sum y_2^2 \] - Sum of the squares of the scores on Pre-test obtained by the subjects of the control group.

\[ \sum y^2 = \sum y_1^2 + \sum y_2^2 \]

\[ \sum x_1 y_2 \] - Sum of the products of the scores on Pre-test and Post-test obtained by the subjects of the control group.

\[ \sum x_y = \sum x_1 y_1 + \sum x_2 y_2 \]

\[ N = Total \] number of subjects in the experimental and control groups.

\[ N = N_1 + N_2 \]

For applying ANCOVA, the procedure suggested and illustrated by Garrett, (1981) was followed. It includes a major step as follows.
Step – I

Determine the correction terms $C_x, C_y$ and $C_{xy}$ being correction on the $x$ scores, the $y$ scores and the $xy$ scores respectively, which are required to make the adjustments of the standard deviation calculated from original measures, taking zero as the assumed mean. They are calculated using the formula.

$$C_x = \frac{(\sum x)^2}{N}$$

$$C_y = \frac{(\sum y)^2}{N}$$

$$C_{xy} = \frac{(\sum x)(\sum y)}{N}$$

Step II

The total sum of squares (SS) for $X$ and $Y$ are calculated using with the formula,

The total sum of squares for $X, SS_x = \sum x^2 - C_x$

The total sum of squares for $Y, SS_y = \sum y^2 - C_y$

The total sum of squares for $XY, SS_{xy} = \sum xy - C_{xy}$

Step III

The sum of squares (SS) among the means of the group are calculate using the formula,
SS among means for $x = \frac{(\sum x_1)^2}{N_1} + \frac{(\sum x_2)^2}{N_2} - C_x$

SS among means for $y = \frac{(\sum y_1)^2}{N_1} + \frac{(\sum y_2)^2}{N_2} - C_y$

SS among means for $x = \frac{(\sum x_1)(\sum y_1)}{N_1} + \frac{(\sum x_2)(\sum y_2)}{N_2} - C_{xy}$

**Step IV**

The sum of squares within groups are calculated using the

Formula for $x = \text{Total SS for } x$-among group means SS for $x$

For $x = \text{Total SS for } y$ - among group means SS for $y$

For $xy = \text{Total SS for } xy$ - among group means SS for $xy$

**Step V**

Calculation of variance for $x$ and $y$ scores are taken separately, the $F$ test is applied to the two sets of scores. This is preliminary analysis of variance to decide whether the scores approach closer to significance.

**Step VI**

The general formula used for the computation of adjusted SS for $y(SS_{yx})$ is

$$SS_{yx} = SS_{y} - \frac{(SS_{yx})^2}{SS_{x}}$$

This is meant for correcting the final $Y$ scores for difference in initial $X$ scores. This is calculated for total $SS$ and within$SS$. Then among means $SS$ is determined by subtracting within $SS$ from total$SS$. 

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From the adjusted sum of squares thus calculated the variance would be computed by dividing each $SS$ for to degrees of freedom. Then $F$ test is applied to the adjusted, among and within variance to determine whether the adjusted means differ significantly.

**Step VII**

From the $SS's$ in $x, y$ and $xy$ it is possible to compare several coefficient of correlations. These are helpful in the interpretation of the result obtained in Step VI. The general formula used is,

$$ r = \frac{SS_{xy}}{SS_x SS_y} $$

It may be applied to the appropriate $SS's$ for total, among means and within groups. The correlation among scores and the correlation among means may be used, in a preliminary way to decide, analysis of co-variance is worthwhile. Regression co-efficient for total, among means and within groups has been calculated using the formula,

$$ b = \frac{SS_{xy}}{SS_x} $$

$b$ within is used in the computation of the adjusted $y$ means in step VIII.
Step VIII

Adjusted \( y \) means are calculated using the formula.

\[
M_{yx} = M_y - b \text{ (within groups)} (M_x - Gen \ M_x)
\]

This step is used to find which means differences, noticed in step VI are significant.

Step IX

For testing the significance of differences among adjusted \( y \) means, the standard error of the difference between two means is calculated using the formula.

\[
S_{ED} = SD_{yx} \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}, \text{ where}
\]

\[
SD_{yx} = \sqrt{MS_{yx} (within)}
\]

Then t value is found from tables and also by substituting in the equation,

\[
t = \frac{D}{S_{ED}}, \text{ where D is the difference between the means. We obtain the level of significance of the difference at 0.05 level or 0.01 level.}
\]

The details of the analysis and interpretation of data using the above mentioned techniques are given in the chapter Analysis and Interpretation.