Chapter 4
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4.1 Introduction

Research is directed towards the solution of a problem. Research is defined as the systematic and objective analysis and recording of controlled observations that may lead to the development of generalisations, principles or theories, resulting in prediction and possibly ultimate control of events (Best and Khan, 1999). The quality of a research depends upon numerous considerations. A methodology is essential to the development of the problem and to the derivation of an effective approach to the solution. Methodology refers to the study design through which validity of results is to be established. The success of the study depends on the suitability of methods selected for the study and the tools and techniques used for collection of data. The selection of method or study depends upon the nature of the problem selected and the kind of data necessary for its solution.

Methodology includes the description of the techniques or methods, variables selected for the study and the tools the researcher has used for collecting, organising, analysing and interpreting data. The details of procedures adopted for the study are explained under the following heads.

4.2 Method adopted for the study

4.3 Design selected

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4.5 Sample selected for the study

4.6 Tools, techniques and materials used for collection of data

4.7 Description of tools, techniques and materials

4.8 Data collection procedures

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4.2 Method Selected for the Study

The experimental method is adopted for the study. The experimental method was adopted to compare the effectiveness of the critical pedagogy combined with constructivist approach in learning commerce at the higher secondary level with that of the activity based approach.

4.2.1 Experimental Method

Experimentation is an attempt to control all essential factors except a single variable which is manipulated or changed with a view to determining and measuring the effect of its operation. This kind of observation of phenomena under controlled conditions is called the experiment. Experimental method involves the active manipulation of an independent variable to observe changes in the dependant variable. In the experimental method, the Investigator has to follow an experimental design. An experimental design is a blueprint of the procedures that enables the researcher to test the hypothesis by reaching valid conclusions about the relationships between independent and dependant variables (Best and Khan, 1999).
4.3 Design Selected

In the present study, ‘pre-test post-test non equivalent group design’ has been adopted. Two intact classroom groups, namely, Experimental group and Control group were considered. The reason for this is that in a school situation it is practically not possible to upset class schedules, to gather subjects to obtain a sufficiently large sample or to reorganise classes in order to employ randomisation procedure to get equivalent experimental and control groups.

The Investigator has made use of two non-equivalent intact classroom groups, one an experimental group and the other a control group. To compensate for the lack of equivalency between two groups, the Investigator has applied the technique of Analysis of Co-variance.

A pre-test was administered to the two groups at first. These groups were then randomly assigned to treatment. The experimental treatment was given to the experimental group and the activity-based instruction to the control group. The post-test was given to two groups. The pre-test and post-test were designed to indicate the effect before and after the treatment. The difference between pre-test and post-test scores were compared with the help of appropriate statistical techniques to ascertain the relative effectiveness of the experimental treatment and the activity-based instruction. The layout of the design is

Experimental group  O_1  X  O_2  
Control group       O_3  C  O_4
In the design $O_1$ and $O_3$ are pre-tests and $O_2$ and $O_4$ are post-tests. X is the experimental group which is instructed through critical pedagogy combined with constructivist approach. C is the control group which is instructed through an activity based approach. An outline of the experimental procedure is given in figure 4.1.

**Fig. 4.1 Non equivalent Pre-test Post-test Design**
4.4 Variables of the Study

Variables are the conditions or characteristics that the experimenter manipulates, controls or observes (Best and Khan, 1999). Independent variables and dependent variables are dealt with in this section.

4.4.1 Independent Variables

Independent variables are the conditions or characteristics that the experimenter manipulates or controls in his/her attempt to ascertain their relationship to observed phenomena (Best and Khan, 1999). Two strategies of independent variable selected for the present study are:

1. Critical Pedagogy Combined with Constructivist Approach
2. Activity-based Approach

4.4.2 Dependent Variables

Dependent variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes or changes independent variable (Best and Khan, 1999). For the present study, the dependent variables include:

1. Achievement
2. Retention power
3. Social and Emotional Skills

4.5 Sample Selected for the Study

The population comprises students of higher secondary schools in Kerala. The sample selected is the representative of the population. The sample consists of students of Class XII. Two groups each from New Higher Secondary School,
Nellimoodu and Government Medical College Higher Secondary School, Thiruvananthapuram were selected for the study. A group of 156 students from Thiruvananthapuram district was taken as sample. The sample selected is purposive in nature. After removing the absentees either in pre-test or in the post-test, the sample size was reduced to 140. Figure 4.2 presents the details of the sample selected for the study.

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**Fig. 4.2 Sample Selected for the Study**
Details of the experimental and control groups are given in table 4.1.

Table 4.1
Break-up of the Sample Selected for the Study

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of school</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New Higher Secondary School, Nellimoodu, Thiruvananthapuram</td>
<td>24</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>2</td>
<td>Government Medical College Higher Secondary School, Thiruvananthapuram</td>
<td>46</td>
<td>46</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>70</td>
<td>70</td>
<td>140</td>
</tr>
</tbody>
</table>

4.6 Tools, Techniques and Materials Used for Collection of Data

1. Prerequisite Test
2. Formative Assessment Tools
3. Summative Assessment Tools (Achievement Tests)
   a) Achievement Test - I (Fixed Response Type)
   b) Achievement Test - II (Free Response Type)
4. Social and Emotional Skills Inventory
5. Lesson Transcripts based on Critical Pedagogy Combined with Constructivist Approach
6. Focus Group Discussions
7. Lesson Transcripts based on Activity-based Approach
4.7 Description of Tools, Techniques and Materials

4.7.1 Prerequisite Test

The Investigator prepared a test to assess the entry behaviour of the students prior to the initiation of the treatment phase. Attempt was made to equip the students with the prerequisites needed to learn the content which were not known to them. A detailed analysis of the unit ‘Marketing Management’ was done and necessary prerequisites needed for learning the unit were determined. Experts scrutinised the result of the analysis and necessary modifications were made. Then, items to test prerequisites were developed and experts scrutinised them. Since the test was prepared after a thorough analysis and scrutiny, the content validity of the test was ensured.

Twenty five objective type test items were prepared by the Investigator for the prerequisite test, each item having one score for the correct response. A compensatory learning programme was carried out in order to help the students attain all the necessary prerequisites. The test and the scoring key are given as appendix - I.

4.7.2 Formative Assessment Tools

The Investigator prepared formative assessment tools for assessing the performance of the students during the classroom transaction. Formative assessment tools consist of;

1. Test items: These are used to measure the level of achievement of concepts after each topic was taught.
2. Rubric: Rubric is a list of indicators of different levels of criterion being used to assess a performance. It is usually a scale ranging from minimum to maximum level. It is needed to assess the quality and quantity of each student’s performance for each criterion. It is used for performance assessment, portfolio assessment, self assessment and peer assessment.

3. Scoring guide: It is a guide which shows the scoring elements on one side and range of performance levels on the other side. It is used for measuring the quality of performance.

The formative assessment tools are used because the formative assessment forms an integral part of the learning-teaching process. Formative assessment ensures meaningful learning through the development of invaluable skills.

According to Brookhart (2007), formative classroom assessment gives teachers information which facilitates instructional decisions and gives pupils information on how to improve their work. The three key elements for the formative assessment process is given as follows.

(1) It informs teaching practice

(2) Instructional decisions are made based on this information

(3) Students receive scaffolded assistance on how to improve their work.

Scotland provides an excellent example of precisely this kind of implementation in practical settings. Between 2002 and 2008, the Scottish Government developed and implemented a project called “Assessment is For Learning (AiFL) in schools across the nation. Two issues arise from the model:

(1) Formative and summative assessment practices may be aligned and do not create tension within the system. Indeed the reality is that when taken
together, they provide key information that informs both classroom decision making (as originally experienced by Bloom, Hastings and Madaus, 1971) and also decisions made regarding the whole system (Scriven, 1967).

2) The assessment of learning (or summative) side of the model emphasises information used to improve the whole school system and the process of schooling across districts.

In short, formative and summative assessment may be beneficially aligned within the same system but summative assessment should not be used as the primary source of data to determine the focus of any classroom intervention.

Formative assessment is a process based on high-quality interaction between the teacher and the student and crucially between peers (the collaborative zone of proximal development)

4.7.2.1 The Principles of Formative Assessment Process

The connection between formative assessment process and lifelong learning has been clearly established by the Organisation for Economic Co-operation and Development (OECD, 2005; Stiggins, 2007). In the formative assessment classroom, students build their understanding of new concepts and work together to assess the quality of their own work and that of their peers against well defined criteria. When students are actively engaged in such activities, they develop invaluable skills for lifelong learning.

The starting point for the work on formative assessment was the idea of providing feedback. However, not all feedback is formative. Feedback becomes formative when learners are:
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- engaged in a process which focuses on meta-cognitive strategies that can be generalised to performance more generally
- supported in their effort to think about their own thinking
- understood the relationship between their previous performance, their current understanding and clearly defined success criteria
- positioned as the agent improving and initiating their own learning

A key finding arising from the OECD study was that higher levels of student achievement and greater equity of student outcomes are among the goals promoted by Formative Assessment. The OECD study (2005) clearly delineates the formative assessment process.

Element I : Establishment of a classroom culture that encourages interaction and the use of assessment tools.

Element II : Establishment of learning goals and the tracking of individual student progress towards those goals.

Element III : Use of varied instruction methods to meet diverse student needs.

Element IV : Use of varied approaches to assess student understanding

Element V : Feedback on student performance and adaptation of instruction to meet identified needs.

Elements VI : Active involvement of students in the learning process.

The formative assessment process is founded upon eight key principles that demand high-quality interaction among students, teachers and parents or carers.

Students need:
• to be able to understand clearly what they are trying to learn and what is expected of them

• to be given immediate feedback about the quality of their work and what they can do to make it better

• to be given advice on how to sustain improvement

• to be fully involved in deciding what needs to be done next

• to be aware of who can give them help if they need it and have full access to such help

• to be able to build knowledge of themselves as learners, and become meta-cognitive.

• to take more responsibility for their learning and participate more in the process of learning

• to engage parents and carers in the learning process

Following figure presents the alignment of formative and summative assessment.

Curriculum Learning and Teaching

Assessment

Fig.4.3 - Alignment of Formative and Summative Assessment

The classroom assessment involves high quality interaction, based on thoughtful questions, careful listening and reflective responses. Assessment comprises the following.

- **Assessment as learning** - It helps to set their own learning goals, identify and reflect on their own evidence of learning.

- **Assessment for learning** - The pupils, teachers and parents are clear about what is to be learned and what success would be like. The pupils and the teachers are given timely feedback about the quality of their work and how to make it better and they are fully involved in deciding the next steps in their learning and identifying who can help.

- **Assessment of learning** - The teachers use a range of evidences from day-to-day activities to check the progress of the pupil. Teachers talk and work together to share standards in and across schools. They use assessment information to monitor the provision of progress of their establishment and to plan for improvement.

The assessment as learning and the assessment for learning forms formative assessment and assessment of learning denotes summative assessment. Formative assessment takes the evidences in the form of performance assessment and portfolio assessment. Performance assessment is done to assess the actual performance of the students during classroom transaction but portfolio assessment is done with a help of products developed by the students as a result of the classroom transaction. Portfolio assessment is dealt with separately, which is given below.
4.7.2.2 Portfolio Assessment

A Portfolio is a profile of the learning initiatives of a student over a period of time. It may include all aspects of his/her learning related activities. The sum total of a student’s effort to learn, the context of learning, his/her own reaction to these contexts and all other related issues are documented in the student’s portfolio. In short, it is a collection of the work of the student over a period of time. A portfolio may include the following.

1. the work done by the child
2. the feedback given by the teacher
3. the observation made by the student on his/her own learning
4. a record of activities undertaken by the student at home or out of classroom contexts
5. observation of parents

There is no rule as such as to what should or should not be included in a portfolio. The aim is to provide a comprehensive profile of a student as a learner. As the file which includes a year’s work is bulky, a separate file which might include the best works of the student over a period of time, the observations of the teacher and the reflections of the child regarding the same, can be used for the purpose of evaluation. But this type of evaluation should be used in order to help the learner reflect on and improve his/her efforts. Also it should help the teacher develop better insights into the different styles of learning of the students.
4.7.2.3 **Items that can be included in a Portfolio**

- Completed homework in class assignments
- Tests (teacher made, curriculum supplied)
- Composition (essays, reports)
- Presentations (recordings, observations)
- Investigations, inventions, projects
- Logs or journals
- Observation checklists (teacher, classmates)
- Visual arts (drawings, paintings, sculptures, pottery)
- Self reflection and analysis of checklists
- Group products
- Evidence of social and emotional skills
- Evidence of work habits and attitude
- Anecdotal records, narrative reports
- Standardised test results
- Photos, autobiographic sketches

4.7.2.4 **Why portfolios?**

1. Portfolios give students the opportunity to direct their own learning
2. Portfolios can be used to determine levels of achievement of students
3. Portfolios can be used to determine students’ growth over time
4. Portfolios can be used to understand how students think, reason, organise, investigate and communicate

5. Portfolios provide an effective way of collecting and demonstrating achievement on a broad range of outcomes that cannot be assessed as effectively with paper and pencil method

6. Portfolios can be used to communicate efforts of students and their progress towards accomplishing learning goals and accomplishments

7. Portfolios can be used to evaluate and improve curriculum and instruction

4.7.2.5 How portfolio will be assessed?

1. The portfolio process - The teacher explains to the students the categories of work samples to be included in the portfolio

2. Rubrics - The teacher develop rubrics to assess the work samples of the students. The students may participate in developing the rubrics

3. Assignments - The students complete assignments knowing that some or all of them will be included in the final portfolio

4. Self assessment - The students reflect on and self assess the quality of their own work and progress towards their learning goals.

4.7.2.6 Steps followed in preparing Formative Assessment Tools for the unit ‘Marketing Management’

In the present study, formative assessment plays the primary role in the learning-teaching process. The steps followed in formative assessment are given below.
1. **Analysis of learning units**

The major unit on ‘Marketing Management’ was divided into four sub-units. These sub-units were analysed keeping in view the objectives, learning activities and assessment with the aim of designing the learning-teaching process more specific.

2. **Preparation of table of cognitive process skills**

Table of cognitive process skills for each sub-unit was prepared based on the guidelines suggested by Anderson and Krathwohl, 1999 through his book “A Revision of Bloom’s Taxonomy of Educational Objectives”. Each element of content was analysed in cognitive process dimension in order to have a meaningful learning among students.

Then, a two-dimensional table was prepared with the content and cognitive process dimension. A frame of the table showing the content and cognitive process skills prepared for the first sub-unit is given in table 4.2. The table of cognitive process dimension for the other 3 sub-units are given as appendix - II.

*Table 4.2*

Two Dimensional Table with Content and Cognitive Process Skills

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Sub units</th>
<th>Cognitive Process Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Remember</td>
</tr>
<tr>
<td>1</td>
<td>Markets &amp; their classification</td>
<td>x</td>
</tr>
<tr>
<td>2</td>
<td>Marketing &amp; Marketing Management</td>
<td>x</td>
</tr>
<tr>
<td>3</td>
<td>Marketing &amp; selling</td>
<td>x</td>
</tr>
<tr>
<td>4</td>
<td>Role of marketing from the point of view of marketeers, consumers &amp; the society</td>
<td>x</td>
</tr>
</tbody>
</table>
3. Preparation of Guidelines

When applying performance assessment and portfolio assessment together as part of formative assessment in the classroom, teachers must organise the assessment carefully and systematically. The following guidelines are to be considered while making assessment.

- The teacher must create an environment, which is conducive to collaborative assessment (Glazer and Brown, 1993).

  If children should feel free to provide their best performances, and to assess their growth, a risk free environment must be created. Learners must feel that their opinions, ideas, and responses carry weight. This will allow the teacher to see a more authentic performance, therefore, providing the teacher with a more realistic picture of the learner’s capabilities.

- The teacher and the learner must be trained in data collection.

  Teacher and learners need to understand the nature of the collaborative assessment process. Both parties should be involved in the decision-making. Teachers need to show learners how to be good collectors of the data, which represents their efforts in the classroom (Glazer and Brown, 1993). Teacher should allow the learners to gather data and monitor their collection over time to make sure they understand the process.

- The teacher and learner child must establish a clear purpose for the assessment

  Performance assessment and portfolio assessment are often used for diagnosis and grading. Each of these forms of assessment can work together to provide information about how a child performs a specific task. The assessment is for a purpose, either to diagnose a learner’s strengths and weaknesses or to certify mastery of an individual performance criterion.
The strengths and weaknesses can be identified through observation and the collection of data, and then remediation can be developed (Airasian, 1994). In the end, the products can be used to illustrate how the learner has progressed toward the achievement of the stated goal or purpose.

- The teacher and learner must determine the scoring and assessment criteria for the learner’s performance and work.

In order to determine the criteria to be used to assess a learner’s performance, the teacher and learner must first decide what is to be included in the assessment. The assessment criteria should be prepared through a discussion with the learners and they should be thoroughly convinced of the assessment criteria. The important point to remember is that assessment should be an ongoing process, and linked to the purposes provided initially. The process of evaluating the learner is as important as the products one evaluates (Mathies and Uphoff, 1992).

- The teacher must provide an appropriate setting in which the performance or task can be demonstrated and stored.

Depending upon the nature of the performance, or the work the learner undertakes, the teacher should observe the learner’s behaviour as it naturally occurs in the classroom or in a particular setting created for a specific performance (Airasian, 1994). The teacher needs to determine in advance where and how to store portfolio information (Fisher and King, 1995).

4. **Preparation of assessment tools**

The assessment tools such as test items, rubrics which consist of evaluation criteria and standards for performance assessment, portfolio assessment, self assessment and peer assessment and scoring guides were prepared and finalised in consultation with experts. Rubrics available at international level were taken in certain cases and modified in order to suit the Kerala context.
Rubrics were finalised by the Investigator with the involvement of students. Stiggins (2004) explained that ‘involving students in developing classroom assignments helps students gain a clear understanding of how their work will be judged. Participating in the development of rubrics helps students begin to assume responsibility for their own learning by building understanding of the criteria teachers consider in giving grades’. These tools were used for assessing the assessment tasks. One of the assessment tasks executed in sub-unit 4 and the suitable assessment tool in the form of scoring guide is given in Table 4.3. The other assessment tools used in the unit are given as appendix - III.

Performance task:- Working as a team from an advertising agency, study food product that you eat everyday in terms of its market, targeting school students. Plan and present an attractive and truthful advertisement aimed at your classmates to induce them to eat more of your product. Promote your product by appealing to their individual needs and wants. Use various techniques to convince your viewers that your product is worth buying but make sure that your claims are accurate and your techniques realistic.
### Table 4.3
**Sample Scoring Guide**

<table>
<thead>
<tr>
<th>Scoring element</th>
<th>Performance Levels</th>
</tr>
</thead>
</table>
| 1. Did the advertisement focus on the qualities or the ingredients of the product | 1. principal focus was on the ingredients of the product  
| | 2. ingredients are only one of many elements given on advertisement  
| | 3. ingredients are mentioned but they are hidden by other elements.  
| | 4. ingredients are totally ignored |
| 2. Did the advertisement appeal to individual’s needs and wants | 1. message grabbed by the whole class  
| | 2. message grabbed by some students  
| | 3. message grabbed by few students  
| | 4. message was not communicable |
| 3. Did the advertisement make use of techniques to convince viewers | 1. techniques were very much suitable and distinctive one  
| | 2. techniques were cheap imitations of advertisements on TV  
| | 3. techniques were a little impressive as it is not really a part of the design.  
| | 4. no techniques |
| 4. Did the advertisement appear realistic in its techniques | 1. very realistic  
| | 2. not so much realistic  
| | 3. many unrealistic elements are there  
| | 4. hard to find out real one |
| 5. Did the advertisement make the target audience want to buy the product | 1. members of the audience rush out to buy the product  
| | 2. members enquire about the product, but will buy only later  
| | 3. members responded positively but buy later  
| | 4. Probably not |
| 6. Did the advertisement have the intended impact on the audience | 1. the advertisement was right on the target  
| | 2. some elements reached the target, not all  
| | 3. a large part of the audience were lost  
| | 4. majority of the audience didn’t get the message |
4.7.2.7 Items included in the Portfolio for the unit ‘Marketing Management’

Portfolio assessment, as a form of formative assessment was used on the experimental group by the Investigator while teaching the unit ‘Marketing Management’. A separate notebook was kept by the students for recording all the learning processes the students engaged themselves in, both individual and group work. The final outcome of the learning processes were recorded and filed by each student. Each student maintained a file for keeping the notebook, the learning products and the learning evidences they collected from their locality and from newspapers, magazines and the internet.

The selected works of the students only be kept in the portfolio. Along with it, the observations of the teacher and the reflections of the students were also kept and were used for assessment for learning. The students have the freedom to select the best products for placing in the portfolio out of the following items:

1. Group products such as presentations made in the classroom
2. Assignments
3. Evidences of tests
4. Study reports, tools for survey, graphical representations of results
5. Products of social interventions like reports for awareness programmes, posters prepared and used for display
6. Seminar report on consumerism and culture
7. A report of case study
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8. Product of debate on consumerism

9. Project report

10. Evidences of self evaluation of social skills

11. Evidences of self evaluation of emotional skills

12. Observation of parents

13. Observation and scaffolding made by the teachers

14. Evidences of reflections made by the students.

A sample student portfolio rubric used as assessment for learning is given in table 4.4. A sample portfolio of a student is given as appendix - IV.
### Table 4.4
**Sample Portfolio Rubric**

<table>
<thead>
<tr>
<th>No.</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Required Items</td>
<td>All required items are included, with a significant number of additions</td>
<td>All required items are included, with a few additions</td>
<td>All required items are included</td>
<td>A significant number of required items are missing</td>
</tr>
<tr>
<td>2. Concepts</td>
<td>Items clearly demonstrate that the desired learning outcome of the unit have been achieved. The student has gained a significant understanding of the concepts and applications</td>
<td>Items clearly demonstrate most of the desired learning outcomes of the unit. The student has gained a general understanding of the concepts and applications</td>
<td>Items demonstrate some of the desired learning outcomes of the unit. The student has gained some understanding of the concepts and has attempted to apply them</td>
<td>Items do not demonstrate basic learning outcomes of the unit. The student has limited understanding of the concepts</td>
</tr>
<tr>
<td>3. Reflection/Critique</td>
<td>Reflections illustrate the ability to effectively critique work, and to suggest great constructive practical alternatives</td>
<td>Reflections illustrate the ability to critique work, and to suggest constructive practical alternatives</td>
<td>Reflections illustrate an attempt to critique work, and to suggest alternatives</td>
<td>Reflections illustrate a minimal ability to critique work.</td>
</tr>
<tr>
<td>4. Overall Presentation</td>
<td>Items are clearly introduced, well organised, and creatively displayed, showing connection between items</td>
<td>Items are introduced and well organized, showing some connection between items</td>
<td>Items are introduced and some what organised, showing some connection between items</td>
<td>Items are not introduced and lack organisation</td>
</tr>
</tbody>
</table>
4.7.3 Summative Assessment Tools (Achievement Tests)

Summative assessment is concerned with gathering information about learning after the learning has occurred, usually for the purpose of assigning the final quality and quantity of student achievement. Hence the Investigator used achievement test as a means of summative assessment. Two interrelated but different assessment instruments are employed to examine achievement and retention levels of the students. A similar case was found in the study conducted by Karaduman and Gultekin (2007). Both of the assessment tools (achievement tests) grounded their questions from the unit ‘Marketing Management’.

The first tool is an Achievement Test which consists of fixed response type items only. It includes 50 multiple choice questions. The second tool is another Achievement Test which consists of free response type items only. It includes 10 open-ended questions. Since the evaluation process with reference to Critical Pedagogy and Constructivist Approach is not solely based on timed tests and assumed as the reflection of the learning of the learners, the Investigator used second achievement test consisting of free response type items in addition to the achievement test based on fixed response type items. In terms of evaluation procedures, the constructivist learning principles challenges the traditional evaluation procedures and employed authentic evaluation techniques. Through the second achievement test, the free expression of the students regarding the content can be evaluated by the Investigator. This helps him/her to get a very clear picture of the extent of cognitive process skills that have enhanced among the learners after the experiment. Students got enough chances to respond to various contexts, in writing and it helps the Investigator to measure the depth of
the level of objectives attained by the students in terms of assessment criteria. The achievement test was constructed;

(1) to judge the outcome of learning in terms of specific objectives.

(2) to assess the process of learning in terms of specific objectives.

(3) to assess the outcome of instructional strategies adopted.

(4) to assess the performance and provide data for giving scores.

(5) to determine the extent to which goals and objectives have been met and desired outcomes achieved.

(6) To assess the entry behaviour and criterion behaviour by considering the achievement test as pre-test and post-test respectively.

The description of the achievement tests consisting of development of test plan, construction of test items and validation of the test are given below.

4.7.3.1 Achievement Test - I (Fixed Response Type)

This is used because learning of commerce requires the students to acquire various concepts and construct knowledge relating to commercial aspects. The Investigator has prepared and standardised the achievement test. The steps followed in the preparation of achievement test is given as follows.

I. Developing a Test Plan

A test plan was prepared keeping in view the test domain and the content to be measured. The following points were planned accordingly.
a. **Selection of standard and topics for the study**

A major chapter named ‘Marketing Management’ from the subject ‘Business Studies’ of Class XII was selected for the study. The chapter is divided into four teaching modules.

1. Marketing concepts and its effect on marketeers, consumers and society as a whole.
2. Functions of marketing
3. Concept of marketing mix and its elements

b. **Selecting the test domain**

The observable and measurable behaviours under cognitive domain of Revised Bloom’s Taxonomy was selected for the present study.

- **Taxonomy of objectives under cognitive domain**

The achievement test was constructed mainly to judge the process and outcome of learning in terms of specific objectives. It is effective when the behaviours to be assessed are clearly defined.

A framework for categorising educational objectives was published by Bloom et al. (1956) as The Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook I: Cognitive Domain. This has provided a basis for test design and curriculum development throughout the world.
(Chung, 1994; Lewy and Bathory 1994; Postlethwaite,1994). According to this, the objectives are classified under six heads which were arranged in a cumulative hierarchy. This means that mastery of a more complex category requires prior mastery of all the less complex categories below it- a stringent standard. The six-level description of thinking in cognitive domain are arranged as knowledge, comprehension, application, analysis, synthesis and evaluation (Bloom and Krathwohl, 1956). This is arranged from the most simple to the most complex level.

The present world is a different place and the taxonomy meet the need for the basic planning tool in education about how children develop and learn and how teachers plan for and teach and make teacher assessment, teacher self-assessment and student assessment in a better way. Education has recognised that teaching and learning encompasses more than just thinking. It also involves the feelings and beliefs of students and teachers as well as the social and cultural environment of the classroom. This increases in knowledge support the need for a revision.

1 Revised Bloom’s Taxonomy

In 1999, Anderson, a former student of Bloom, Krathwohl and their colleagues published an updated version of Bloom’s Taxonomy that takes into account a broader range of factors that have an impact on teaching and learning. It was a group effort of Cognitive Psychologists, Curriculum Theorists and Instructional Researchers and Testing and Assessment Specialists. The groups met to discuss the revision and laid some plans many times. The final revised
draft manuscript was the focus of discussion at a meeting held in Syracuse in October 1994. Changes occurred in their broad categories—emphasis, terminology and structure.

I  Four changes in Emphasis

1. The revision’s primary focus is on the taxonomy in use.

   The revision emphasises the use of taxonomy in planning curriculum, instruction, assessment and their alignment. The original framework focused mainly on assessment, providing extensive examples of test items for each of the six categories. The revision not only demonstrates that Bloom’s perception were realistic but also modifies the taxonomy in ways intended to make it increasingly and more broadly effective.

2. The revision is aimed at a broader audience, emphasising teachers.

   The revision is designed to be of use to teachers at all grade levels.

3. Sample assessment tasks are included primarily to convey meaning.

   The revision includes sample assessment tasks for example, performance task and test items primarily to help illustrate and clarify the meaning of the various categories.

4. The revision emphasises the sub-categories.

   The sub-categories of knowledge dimension and cognitive process dimensions were given due focus in the revised taxonomy.

II. Four changes in Terminology

1. Major category titles were made consistent with how objectives are framed.

   The revision made a slight adjustment to the original terms to provide consistency with the way objectives are framed, which was missing in the
original framework. Educational objectives indicate that the student should be able to do something (verb) to or with something (noun); a verb-noun relationship.

2. The knowledge sub-categories were renamed and reorganised.

The knowledge sub-categories are re-framed as four types of knowledge, namely, factual knowledge, conceptual knowledge, procedural knowledge and meta-cognitive knowledge.

Knowledge Dimension Defined

a) Factual knowledge encompasses the basic elements that experts use in communicating about their academic discipline, understanding it and organising it systematically.

b) Conceptual knowledge includes knowledge of categories and classifications and the relationships between them. Conceptual knowledge includes schemas, mental models, or implicit or explicit theories in different cognitive psychological models.

c) Procedural knowledge is the “knowledge of how” to do something. The “something” might range from completing fairly routine exercises to solving novel problems.

d) Meta-cognitive knowledge is knowledge about cognition in general as well as awareness of and knowledge about one’s own cognition. One of the hallmarks of theory and research on learning since the publication of the original Handbook is the emphasis on making students more aware of and responsible for their own knowledge and thought. The major types and sub-types of knowledge are given in table 4.5.
Table 4.5

The Knowledge Dimension

<table>
<thead>
<tr>
<th>Major Types</th>
<th>Subtypes</th>
</tr>
</thead>
</table>
| **A. Factual Knowledge** - The basic elements students must know to be acquainted with a discipline or to solve problems in it. | **Aa.** Knowledge of terminology  
**Ab.** Knowledge of specific details and elements. |
| **B Conceptual Knowledge** - The inter relationship among the basic elements within a larger structure that enable them to function together. | **Ba.** Knowledge of classifications and categories  
**Bb.** Knowledge of principles and generalisations.  
**Bc.** Knowledge of theories, models and structures |
| **C Procedural Knowledge** - How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods. | **Ca.** Knowledge of subject-specific skills and algorithms.  
**Cb.** Knowledge of subject-specific techniques and methods.  
**Cc.** Knowledge of criteria for determining when to use appropriate procedures. |
| **D Metacognitive Knowledge** - Knowledge of cognition in general as well as awareness and knowledge of one’s own cognition. | **Da.** Strategic Knowledge  
**Db.** Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge  
**Dc.** Self knowledge |

3. Sub categories of the cognitive process categories were replaced by verbs.

The verbs selected met two criteria

(1) they represented cognitive processes incorporated within cognitive theory and research.

(2) they were the type of processes commonly encountered in statements of objectives and unit plans of teachers.

The cognitive process dimension is given in Table 4.6.
Table 4.6
The Cognitive Process Dimension

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Remember</strong></td>
<td>Retrieve relevant knowledge from long-term memory</td>
</tr>
<tr>
<td><strong>1.1 Recognizing</strong></td>
<td>Identifying</td>
</tr>
<tr>
<td><strong>1.2 Recalling</strong></td>
<td>Retrieving</td>
</tr>
<tr>
<td><strong>2. Understand</strong></td>
<td>Construct meaning from instructional messages, including oral, written, and graphic communication</td>
</tr>
<tr>
<td><strong>2.1 Interpreting</strong></td>
<td>Clarifying, paraphrasing, representing, translating</td>
</tr>
<tr>
<td><strong>2.2 Exemplifying</strong></td>
<td>Illustrating, instantiating</td>
</tr>
<tr>
<td><strong>2.3 Classifying</strong></td>
<td>Categorising, subsuming</td>
</tr>
<tr>
<td><strong>2.4 Summarising</strong></td>
<td>Abstracting, generalising</td>
</tr>
<tr>
<td><strong>2.5 Inferring</strong></td>
<td>Concluding, extrapolating, interpolating, predicting</td>
</tr>
<tr>
<td><strong>2.6 Comparing</strong></td>
<td>Contrasting, mapping, matching</td>
</tr>
<tr>
<td><strong>2.7 Explaining</strong></td>
<td>Constructing models</td>
</tr>
<tr>
<td><strong>3. Apply</strong></td>
<td>Carry out or use a procedure in a given situation</td>
</tr>
<tr>
<td><strong>3.1 Executing</strong></td>
<td>Carrying out</td>
</tr>
<tr>
<td><strong>3.2 Implementing</strong></td>
<td>Using</td>
</tr>
<tr>
<td><strong>4. Analyse</strong></td>
<td>Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose.</td>
</tr>
<tr>
<td><strong>4.1 Differentiating</strong></td>
<td>Discriminating, distinguishing, focusing, selecting</td>
</tr>
<tr>
<td><strong>4.2 Organising</strong></td>
<td>Finding coherence, integrating, outlining, parsing, structuring</td>
</tr>
<tr>
<td><strong>4.3 Attributing</strong></td>
<td>Deconstructing</td>
</tr>
<tr>
<td><strong>5. Evaluate</strong></td>
<td>Make judgements based on criteria and standards</td>
</tr>
<tr>
<td><strong>5.1 Checking</strong></td>
<td>Coordinating, detecting, monitoring, testing</td>
</tr>
<tr>
<td><strong>5.2 Critiquing</strong></td>
<td>Judging</td>
</tr>
<tr>
<td><strong>6. Create</strong></td>
<td>Put elements together to form a coherent or functional whole; reorganise elements into a new pattern or structure.</td>
</tr>
<tr>
<td><strong>6.1 Generating</strong></td>
<td>Hypothesising</td>
</tr>
<tr>
<td><strong>6.2 Planning</strong></td>
<td>Designing</td>
</tr>
<tr>
<td><strong>6.3 Producing</strong></td>
<td>Constructing</td>
</tr>
</tbody>
</table>
4. Comprehension and synthesis were re-titled

The word ‘understand’ is used because this group gave more weight to the universal usage of the term in selecting names for the categories. ‘Synthesis’ is renamed as ‘create’.

III Four changes in Structure

1. The noun and verb components of objectives became separate dimensions.

The noun aspect retained the label ‘knowledge’, and became separate dimension with four categories as factual, conceptual, procedural and Meta-cognitive. The verb aspects of six categories formed cognitive process dimension as remember, understand, apply, analyse, evaluate and create.

2. The two dimensions are the basis for our analytical tool, the taxonomy table.

The relationship of knowledge dimension and cognitive process dimension are depicted in a two-dimensional structure called the taxonomy table which is given in table 4.7. The cells of taxonomy table help to examine the objectives, instructional activities and assessment tasks.

Table 4.7
The Taxonomy Table

<table>
<thead>
<tr>
<th>The Knowledge Dimension</th>
<th>The Cognitive Process Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Remember</td>
</tr>
<tr>
<td>A. Factual Knowledge</td>
<td></td>
</tr>
<tr>
<td>B. Conceptual Knowledge</td>
<td></td>
</tr>
<tr>
<td>C. Procedural Knowledge</td>
<td></td>
</tr>
<tr>
<td>D. Meta-Cognitive</td>
<td></td>
</tr>
</tbody>
</table>


3. The process categories do not form a cumulative hierarchy.

The revised framework is a hierarchy in the sense that the six major categories of the cognitive process dimension are presumed to be ordered in terms of increasing complexity. In order to conform to the language that teachers use, the six categories are allowed to overlap on a scale of judged complexity. Therefore the revision places much greater importance on teacher-usage than on developing a strict hierarchy.

4. The order of *synthesis/create* and *evaluation/evaluate* was interchanged.

The revised taxonomy interchanged the order of the top two cognitive process categories placing ‘create’ as the most complex category instead of ‘evaluate’. The summary of the structural changes from the original framework to the revision is given in figure 4.4.

![Fig.4.4 Summary of the Structural Changes from the Original Framework to the Revision](image-url)
Considering the viability of using critical pedagogy and constructivist approach to activate learning from an array of students and the reliability of using Bloom’s taxonomy to promote higher order thinking skills, the Investigator used two-dimensional taxonomy table (Table 4.7) to plan the coordination of objectives, learning activities and assessment for the practical application of the present study. It serves as a quick reference tool for planning the lessons.

Countries have recognised that a broad range of competencies are needed to prepare children for an unpredictable future to meet the needs of the 21st century. Higher order thinking skills are required to be developed in learners in addition to basic skills because information is expanding at such a rate that individuals require transferable skills to enable them to address different problems in different contexts at different times throughout their lives. The complexity of modern jobs requires people who can comprehend, judge and participate in generating new knowledge and processes. Modern democratic societies require its citizens to assimilate information from multiple sources, determine its truth and use it to make sound judgements. So the challenge of the present study is to reach beyond the comfort zone by helping the students to develop higher order thinking skills throughout the unit of study. Hence the Investigator planned the lesson by following two main steps, which are given in detail under the head ‘Development of lesson transcripts’.

1. Selecting the content and planning the knowledge to be constructed.

2. Using the taxonomy table to plan the synchronisation of objectives, learning activities and assessment.
Based on the above stated revised Bloom’s taxonomy of the cognitive domain, the Investigator prepared the test, keeping in view:

1. The types of knowledge such as Factual, Conceptual, Procedural and Meta-cognitive expected from the unit.
2. Cognitive process skills such as Remembering, Understanding, Applying, Analysing, Evaluating and Creating.

II. Construction of Test Items and Pilot Testing

a. Preparation of test items for draft achievement test - I

In this achievement test, only multiple choice questions were selected because their efficiency and reliability tend to be high. Multiple choice questions are the most versatile of all objective test items in that they can be used to measure both simple and complex objectives at all grade levels and in all subject matter areas. Objective test cover more fully the content of an instructional unit because many questions can be asked.

Multiple choice questions are designed for objective measurement of the outcome and it contains a stem and four responses, one of which is the best answer (Airasian, 1994). Clarity, precision and relevance of the items were considered while preparing the test items. The Investigator developed the test items keeping in view the content, objectives and the blueprint.

The test construction requires expertise in the area. The items so prepared were given to a panel of experts consisting of experts in the subject, experts in pedagogy and practising higher secondary teachers for scrutiny. They reviewed the test items keeping in view the objectives, content and blueprint. 100 questions
were prepared before pilot study. On the basis of the suggestions given by experts, some questions were deleted and some have been modified. Finally 86 test items were selected in the draft achievement test. The Investigator prepared a scoring key for the draft achievement test. Each question carries one score. The draft achievement test and its scoring key were given as appendix - V

b. Pilot Testing

The draft achievement test was subjected to pilot testing. The draft test was administered in four schools on a sample of 160 students of class XII. The schools selected have the same features of sample taken for experimental study. It includes both rural and urban and both government and government-aided schools. The details of the schools and number of students to which the test was administered is given in table 4.8.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Schools</th>
<th>No of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Govt. GHSS, Manacaud, TVM.</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>RKD NSS HSS, Sasthamangalam, TVM.</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>Govt. Medical College HSS, TVM.</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>New HSS, Nellimood, Neyattinkara, TVM.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>160</strong></td>
</tr>
</tbody>
</table>

Even though the experts reviewed the test items and made suggestions, the drafted items may contain an error or subtle ambiguity, or may be too hard or too easy for the students. Only a pilot study can reveal whether the item will work as intended. Hence the Investigator administered the draft achievement test in order to identify the appropriateness of the items in the test.
After getting permission from the school authorities, the Investigator, with the help of the subject teacher administered the test to 160 students who had already learned the topic. Brief instructions for completion were clearly and prominently indicated. Participants had to write the letter A, B, C, D preceding the appropriate answer to the questions to indicate their choice (Babbie, 1975). Sufficient time was given to the students to complete the test. Response sheets were collected and scored strictly in accordance with the scoring key prepared for evaluation.

The pilot study helped the Investigator to find out the difficulty of each item, to identify distractors which do not appear plausible, to assist in determining the precision of the test, to suggest the number of test items for the final test, and to identify the time required for most students to complete the test through the analysis of student responses.

c. Item Analysis

The quality of each test item was determined by analysing two important features of the items - the difficulty index and the discriminating power. Kelley’s method (1939) was used to calculate the difficulty index and discriminating power. For the purpose of item analysis, the response sheets were arranged in the descending order. The responses of the top scoring 27% of sheets and the bottom scoring 27% were used for item analysis. The number of examinees getting the same items correct in the top or upper group (U) and the number of examinees getting the same items correct in the bottom or lower group (L) were identified. A standard formula was applied for calculating the difficulty index and the discriminating power.
(a) Discriminating Power

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

where \( N \) is total number of students either in upper group or lower group.

b. Difficulty Index

\[ Di = \]

The item having difficulty index value between 0.3 and 0.7 and discriminating power value above 0.3 were selected for the final achievement test. Difficulty index is a measure of the proportion of examinees who responded correctly to an item. Discrimination power is a measure of how well the item discriminates between examinees who are knowledgeable in the content area and those who are not.

III. Preparation of Final Achievement Test - I

The final achievement test was prepared on the basis of a design by giving proper weightage to content, objectives and difficulty level, which is given below.

The Design of the Test

The design consists of weightage to content, weightage to objectives, weightage to type of questions, weightage to difficulty level and blue print.

1. Weightage to Content for Achievement Test - I

A detailed analysis of the content provides a summary of the concepts and knowledge expected from the syllabus expressed in content terms. The weightage to content is given in table 4.9.
Table 4.9

Weightage to Content for Achievement Test - I

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Content</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Marketing concepts &amp; its effect on marketeers, consumers and society</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>Functions of marketing</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>Concept of marketing mix and its elements</td>
<td>19</td>
</tr>
<tr>
<td>4.</td>
<td>Advertisement and personal selling, its influence on society, marketeers &amp; consumers</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

2. Weightage to Objectives for Achievement Test - I

The test was designed to assess the achievement of students in the cognitive domain. The objectives selected for test construction are remembering, understanding, applying, analysing, evaluating and creating. The weightage to objectives is given in table 4.10.

Table 4.10

Weightage to Objectives for Achievement Test - I

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Objectives</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remembering</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Understanding</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Applying</td>
<td>11</td>
</tr>
<tr>
<td>4.</td>
<td>Analysing</td>
<td>17</td>
</tr>
<tr>
<td>5.</td>
<td>Evaluating</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>Creating</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>
3. Weightage to Type of Questions for Achievement Test - I

The Investigator selected objective type test items only in this achievement test. The purpose of the test is to judge whether the learners gained the outcome of learning.

4. Weightage to Difficulty Level for Achievement Test - I

Based on the difficulty level the items in the test were classified into easy, average and difficult. The weightage to difficulty level is given in table 4.11.

*Table 4.11*

**Weightage to Difficulty Level for Achievement Test - I**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Difficulty level</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Easy</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Difficult</td>
<td>8</td>
</tr>
</tbody>
</table>

5. Blueprint of Final Achievement Test - I

Based on the weightages given to content and objectives, blueprint was prepared. It gives an overall picture of the design of the test. Only objective form of questions were selected for the achievement test. The blueprint is given in 4.12.
### Table 4.12

**Blueprint of sssAchievement Test - I**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Content</th>
<th>Remembering</th>
<th>Understanding</th>
<th>Applying</th>
<th>Analysing</th>
<th>Evaluating</th>
<th>Creating</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marketing concepts &amp; its effect on marketeers, consumers and society</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>Functions of marketing</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>Concept of marketing mix and its elements</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>-</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>4.</td>
<td>Advertisement and personal selling, its influence on society, marketeers &amp; consumers</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>10</strong></td>
<td><strong>11</strong></td>
<td><strong>17</strong></td>
<td><strong>5</strong></td>
<td><strong>3</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>
The final achievement test consists of 50 multiple choice test items carrying one score each. A copy of final achievement test and its scoring key were given as appendix - VI.

IV Validation of the Achievement Test

The two most important consideration of a well constructed achievement test are validity and reliability (Gronlund, 1993). Achievement test results should accurately measure individual differences or achievement and should always foster learning. To fulfil these purposes, a test must be valid and reliable. Hence the Investigator measured both the validity and reliability of the constructed achievement test.

1. Reliability of the Achievement Test

The reliability of the achievement test was established by using split-half method. A sample of 100 students studying in two divisions of class XII was used for the purpose. The obtained ‘r’ value was correlated using the Spearman- Brown-Prophery formula. The coefficient of correlation obtained was 0.81. This indicated that the test yields reliable measure of achievement

2. Validity of the Achievement Test

Content validity is the most important property of any measuring instrument (Borg and Gall, 1989). Content validity is the expert judgement of the degree to which test items faithfully represent the content to be tested. The degree to which test content is valid is assessed “by an objective comparison of the test items with curricular content” (Borg and Gall 1989). The Investigator ensured the content validity of the achievement test by keeping in view the weightages given
for content and objectives. The test was prepared on the basis of the valid opinion given by experts on the subject. The validity of the test was estimated with the help of the last unit test conducted by the school. The coefficient of correlation obtained was 0.71 which indicates a valid tool for measuring achievement.

4.7.3.2 Achievement Test - II (Free Response Type)

In order to get a more clear picture of the reflection of learning of the learners and to assess the extent of cognitive process skills that have enhanced among the students in a very clear manner, this achievement test was used by the Investigator. The steps followed in preparing the test is given below.

1. Developing a test plan

A test plan was prepared keeping in view the test domain and the content to be measured. The following points were planned accordingly.

   a) Selection of standard and topics for the study.

   The same topics and the same standard detailed under Achievement test - I is followed here.

   b) Selecting the test domain

   The Cognitive domain of revised Bloom’s Taxonomy detailed earlier was taken into consideration.

II Construction of test items

a. Preparation of test items

The Investigator developed a draft achievement test containing 15 free response type questions keeping in view the principles of critical pedagogy and constructivism. The test items were developed considering the learning outcomes
being tested. This achievement test was reviewed by a panel of experts consisting of experts on the subject and practising teachers and 5 questions were eliminated on their recommendations. Necessary modifications were made in the questions as per the suggestions given by the experts. The draft achievement test - II is given as appendix - VII.

b. Preparation of assessment criteria

Assessment criteria are descriptions of what the learner has to do in order to demonstrate that the learning outcomes have been achieved. The learning outcomes being tested, the assessment task, the attributes of successful performance of the task and conversion of the requirements into clear assessable criteria are to be considered for the preparation of assessment criteria.

The assessment criteria for the test items were prepared by the Investigator in consultation with the panel of experts. The assessment criteria were finalised by incorporating the suggestions given by the experts and answer scripts were valued according to the assessment criteria.

III Preparation of Final Achievement Test - II

The final achievement test - II consists of 10 free response questions. This was prepared on the basis of a design by giving proper weightages to content, objectives and difficulty level.

The Design of the Test

The design of the final achievement test consists of weightage to content (Table 4.13), weightage to objectives (Table 4.14), weightage to type of questions (Table 4.15), weightage to difficulty level (Table 4.16) and blue print (Table 4.17).
### Table 4.13

**Weightage to Content for Achievement Test - II**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Content</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Marketing concepts &amp; its effect on marketeers, consumers and society</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Functions of marketing</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>Concept of marketing mix and its elements</td>
<td>12</td>
</tr>
<tr>
<td>4.</td>
<td>Advertisement and personal selling, its influence on society, marketeers &amp; consumers</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

### Table 4.14

**Weightage to Objectives for Achievement Test - II**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Objectives</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remembering</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Understanding</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Applying</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Analysing</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>Evaluating</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Creating</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

### Table 4.15

**Weightage to Type of Questions for Achievement Test - II**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Type of questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Short Answer</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Essay</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

### Table 4.16

**Weightage to Difficulty Level for Achievement Test - II**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Difficulty level</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Easy</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Average</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Difficult</td>
<td>15</td>
</tr>
</tbody>
</table>
### Table 4.17

**Blueprint of Achievement Test - II**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Content</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Remembering</td>
</tr>
<tr>
<td>1.</td>
<td>Marketing concepts &amp; its effect on marketeers, consumers and society</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>2.</td>
<td>Functions of marketing</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Concept of marketing mix and its elements</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Advertisement and personal selling its influence on society, marketer &amp; consumers</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

Note: The number given in bracket denotes the serial number of the questions. The number given outside bracket denotes the total score.
The final achievement test - II containing 10 free response type questions and their assessment criteria are given as appendix - VIII.

IV Validation of the test

Content validity is the expert judgement of the degree to which test items faithfully represent the content to be tested. The Investigator ensured the content validity of the achievement test by keeping in view the weightages given for content and objectives. The test was prepared on the basis of the valid opinion given by subject experts. The thorough analysis and scrutiny made in the preparation of the test ensures its content validity.

4.7.4 Social and Emotional Skills Inventory (SES Inventory)

The following are the steps followed in the construction of SES Inventory.

I Developing a test plan

A test plan was developed that would define the purpose of the test, the target group and the major components of the attributes of critical pedagogy and constructivist approach under affective domain. The purpose of the test is to help participants to reflect on their own social and emotional skills at two points of time. The target group was the students of commerce at the higher secondary level. The five fold categorisation of the social and emotional aspects of learning developed by Goleman (1996), namely, Self awareness, Managing feelings, Motivation, Empathy and Social skills, was taken in this study and each aspect is subdivided into skills and then still further into a series of learning outcomes.
Social and Emotional skills

Social and emotional skills are the skills of making positive relationships with other people, of understanding and managing ourselves and our own emotions, thoughts, and behaviours, and understanding and responding to the emotions and behaviours of others in ways that are in the best long-term interest of ourselves and others.

The five-fold categorisation deals with five aspects which have been 'unpacked' into a wide range of universal learning outcomes and to more specific ones which are appropriate for particular age groups and particular learning opportunities used in the curriculum materials. The five fold categorisation comprises the following.

1. **Self awareness**

   It implies knowing one’s internal state, preferences, resources and intuitions. It is composed of the following personal elements.

   1. **Understanding one’s** - recognising one’s emotions and their effects
      feelings
   2. **Knowing oneself** - knowing one’s strength and limits, having a strong sense of self worth and capabilities

2. **Managing feelings**

   It implies knowing one’s ability to manage one’s internal states, impulses and resources. It is composed of the following elements.

   1. **Self control** - keeping disruptive emotions and impulses in check.
2. **Trust worthiness** - maintaining standard of honesty and integrity
3. **Conscientiousness** - taking responsibility for personal performance
4. **Adaptability** - flexibility in handling change
5. **Innovation** - being comfortable with novel ideas, approaches and information

3. **Motivation**

   It refers to the emotional tendencies that guide or facilitate reaching one’s goals in life. This consists of

   1. **Achievement desire** - Striving to improve or meet a standard of excellence
   2. **Commitment** - Aligning with the goals of the group or organisation
   3. **Initiative** - Readiness to act on opportunities
   4. **Optimism** - Persistence in pursuing one’s goals despite obstacles and set backs.

4. **Empathy**

   It implies one’s quality of awareness of the feelings, needs and concerns of others. This is composed of:

   1. **Understanding others** - sensing the feelings and perspectives of others and taking an active interest in their concerns.
   2. **Developing others** - sensing the development needs of others and fostering their abilities.
   3. **Service orientation** - anticipating, recognising and meeting the needs of others.
   4. **Leverage diversities** - cultivating opportunities through different kinds of people.
5. Political awareness - reading the emotional currents and power relationships of a group.

5. Social skills

This covers one’s ability to adapt to enduring awareness of the feelings, needs and concerns of others. This is composed of:

1. Influence - wielding effective tactics for persuasion
2. Communication - listening openly and sending convincing messages
3. Conflict Management - negotiating and resolving disagreements
4. Leadership - inspiring and guiding individuals and groups
5. Change catalyst - initiating or managing change
6. Building bonds - nurturing instrumental relationships
7. Collaboration and Co-operation - working with others towards shared goal
8. Team capabilities - creating groups, synergy in pursuing collective goals.

A group of items for the inventory was generated after a careful review of the behavioral characteristics and disposition associated with each skill described above.

When a class aims at enhancing social and emotional skills, it is necessary that the teachers should be constantly asking themselves how they can encourage pupils to take ownership. Ideas might include:

- providing opportunities for pupils to plan and deliver learning opportunities both to their peers and to pupils younger to them
• involving pupils in the identification of criteria that demonstrate success
• involving pupils in the evaluation of their learning
• providing choice as to how activities and tasks are completed and information presented
• providing opportunities for pupils to be involved in developing and running peer support
• systems such as mentoring, counselling, buddyng, peer mediation and so on
• providing opportunities for pupils to take part in community activities outside school that involve social and emotional learning.
• allowing pupils to determine their own questions for enquiry and debate
• providing opportunities for pupils to determine class and playground rules and routines, and ground rules
• providing opportunities for pupils to explore how they might establish a classroom environment and ethos that promotes good learning and emotional well-being

Participation can take pupils beyond just receiving what is offered through the 'taught' curriculum. It challenges and supports them to become active agents in shaping and influencing school provision. Social and emotional skills underpin effective learning by helping all pupils to do the following.

• learn to manage their impulses, helping them settle quickly, concentrate and not disrupt others.
• build warm relationships, which help them to care what others (e.g. staff and peers) think and to respond positively to them.

• manage strong and uncomfortable emotions such as anger and frustration, and become more resilient, which helps them rise to the challenges of the learning process and stick to it if things get tough.

• learn to feel good about themselves, which reduces the likelihood of disruptive behaviour and increases capacity for independent learning.

• manage anxiety and stress, including tests and examinations.

• learn to empathise, for example with the desire of other pupils to learn, which helps them contribute to a positive learning environment.

• reflect on long term goals, which helps them see the point of learning, raise their aspirations and become more able to resist negative pressure from others.

• feel optimistic about themselves and their ability to learn, which improves their motivation to work hard and attend classes regularly.

2. Construction of test items and pilot testing

a. Preparation of test items

Items describing the specific behaviours and dispositions associated with each of the skill area were constructed. The items constructed are clear representations of a specific dimension on critical pedagogy and constructivist approach which is appropriate for students of the higher secondary level. A pool of 50 items was constructed for the draft inventory. It consists of 25 items under social skills and 25 items under emotional skills which is given as appendix-IX
The draft inventory which consists of likert-type items with rating provides the respondents with five choices to rate ranging from ‘(0) Never (1) Rarely (2) Sometimes (3) Often (4) Most often’ and with clearly written directions for completing the inventory. Items are statements that describe the behaviour pattern and disposition of students. The skill area headings such as social skills, emotional skills were removed to prevent the participants from being influenced by the labels of the various skills. The various items are randomly arranged.

b. Pilot testing

In order to make the test items clear in its wording, for ease of completion and clarity of direction, a pilot study was conducted on 100 higher secondary school students. Based on the feedback the Investigator modified and selected the item for the draft inventory. The details of the schools selected and the number of students to which pilot testing was administered are given in table 4.18.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Schools</th>
<th>No of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RKD, NSS HSS, Sasthamangalam, TVM.</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Govt. Medical College HSS, TVM.</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>New HSS, Nellimood, Neyattinkara, TVM.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 4.18
Sample Selected for Pilot testing of SES Inventory

c. Item analysis

It is a process of establishing the suitability of an item for inclusion in the final test. The quality of an item was ascertained by analysing the ‘t’ value. The items representing each skill area were analysed separately. For the purpose of
Methodology

item analysis, the response sheets were arranged in the descending order under each skill area. The response of the top scoring 27% of sheets and the bottom scoring 27% in each skill area was used for item analysis.

According to Edwards (1957), these two groups provide criterion groups in terms of which to evaluate the individual statements, a ratio of ‘t’ was found out in evaluating the responses of high and low groups to the individual statements. The value of ‘t’ is a measure of the extent to which a given statement differentiates between the high and low groups. ‘t’ value ≥ 1.96 indicates that the average response of the high and low groups to a statement differs significantly.

d. Finalisation of test items

40 statements with the largest ‘t’ values (t>1.96); 20 items from each area were selected for the final form of SES inventory. The final form of SES Inventory was also given as Appendix - X.

These test items were given to a panel of experts for scrutiny. They scrutinized the test items keeping in view whether the items belong to the skill area concerned, its clarity, readability and the relevance. Necessary modifications were made accordingly. Finally, 40 items were selected for the study.

III Validation of the Inventory

a. Reliability of the Inventory

A test is reliable to the extent that it measures whatever it is measuring consistently. In tests that have a high coefficient of reliability, errors of measurement have been reduced to a minimum. The reliability is usually expressed
as a correlation coefficient. In the present study, reliability was estimated by using split-half method using Spearman-Brown-Prophery formula. A sample of 100 pupils studying in two divisions of class XII was used for the purpose. Here the odd numbered items were treated as one half of the test and scored separately and all the even numbered items were treated as another half and scored. The scores of the halves in each section were correlated and the reliability of the test was found to be 0.81 for social skills and 0.83 for emotional skills.

b. Validity of the Inventory

A test is valid if it measures what it claims to measure. Content validity refers to the degree to which the test actually measures or is specifically related to the traits for which it was designed. It shows how adequately the test samples the universe of knowledge and skills that a student is expected to master. The Investigator ensured content validity of this inventory in such that the construct being measured is clearly defined and the items used to measure the construct are representatives of the construct’s domain.

4.7.5 Lesson Transcripts based on Critical Pedagogy Combined with Constructivist Approach

After analysing the Business Studies text book of Standard XII in the Kerala syllabus deeply, the unit ‘Marketing Management’ was selected for the present experimental study.

The Investigator prepared the lesson transcripts for the topic based on the combination of the steps proposed in Revised Blooms Taxonomy and Yager’s Constructivist Model. The Investigator used two dimensional taxonomy table,
Methodology

according to Revised Blooms Taxonomy, for planning the synchronisation of objectives, learning activities and assessment for each module. It serves as a quick reference tool for planning the lessons. The two dimensions represent the types of knowledge and the cognitive process skills. The learning teaching process was planned by following sequence developed by Yager. It includes Introduction, Exploration, Explanations and solutions, and Taking action. The procedure adopted in the preparation of lesson transcripts are given as follows.

4.7.5.1 Planning of the unit

The Investigator prepared a comprehensive plan covering different aspects of lesson transcripts and proposed activities on the basis of critical pedagogy combined with constructivist approach. It includes the following.

1. Selection of the topic

The topic was selected after a detailed examination of the content of higher secondary Business Studies curriculum and from the Investigator’s own field of study.

2. Writing assumptions about the learner

Since the lesson transcripts and proposed activities were planned to be prepared for the students of standard XII Commerce students, the Investigator has tried her maximum to collect details about the characteristics in terms of age, intellectual level, general scholastic abilities, potential of learning, the locale of students and the social issues concerned with marketing existing in their locality. For the purpose, the Investigator depended on cumulative
records, scores of achievement tests and focus group discussion with parents, teachers and students.

3. Fixing the instructional objectives and entry behaviour of learners

The Investigator has set the definite instructional objectives and stated it clearly in behavioural terms that is expected from the learners after the transaction of the lesson transcripts on the basis of critical pedagogy combined with constructivist approach. The Investigator collected details about the entry behaviour of the learners by applying an achievement test as a prerequisite test.

4. Developing specific outlines of the content

Here the Investigator developed the specific themes on the topic ‘Marketing Management’ on the basis of the basic assumptions about the learners, social issues concerned with marketing existing in their locality, their entry behaviour, objectives to be realised in the form of terminal behaviour and the Business Studies text book of Standard XII. For the purpose, the investigator resorted to the help of

a. Personal experiences and observation of the related course

The Investigator is an academician in this field, who keeps in touch with the teachers and students of commerce at the higher secondary level and knows the pulse of the commerce course. As part of Investigator’s profession, the Investigator coordinates the training of commerce teachers and makes visits to schools in order to know the effectiveness of commerce learning at the higher secondary level.
b. Conducting Focus group discussions

Two Focus group discussions were carried out for drawing out an outline of detailed content of the unit concerned. This helped the Investigator to develop the lesson transcripts and associated activities used for teaching the experimental group.

i. Focus Group Discussion consisting of experts, experienced higher secondary teachers of commerce and the Investigator was held for fixing the themes in the unit and for integrating the pedagogy which incorporates the features of constructivism and critical pedagogy with content. The schedule and the list of members is given as appendix - XI.

ii. Focus Group Discussion consisting of parents, teachers, students and the Investigator was held for knowing the locale of the students and the social issues concerned with marketing existing in their locality. The schedule and the list of members is given as appendix - XII.

c. The analysis of the prescribed syllabus of the unit

A study of curriculum of Business Studies and textbooks, reference books, industrial sites and social issues existing in the locality of the students were made use of for analysing the syllabus of the unit concerned. Help from experts in the subject such as the experts from universities, colleges and experienced practising teachers were sought for the purpose.

4.7.5.2 Developing Lesson Transcripts based on Critical Pedagogy Combined with Constructivist Approach

It includes actual preparation of lesson transcripts on the basis of critical pedagogy combined with constructivist approach. Here the unit is divided into
four meaningful sub-units, which consist of thirty two lesson plans prepared in the form of four modules, namely:

1. Marketing concepts & its effect on marketeers, consumers and society as a whole

2. Functions of Marketing

3. Concept of marketing mix & its elements

4. Advertisement and personal selling, its influence on society, marketeers and consumers

A plan showing the analysis of each module in terms of the taxonomy table based on objectives, learning activities and assessment was prepared first. A sample plan showing the analysis of first module is given in table 4.19. Other plans are given as appendix - XIII. The content of each module was analysed in terms of types of knowledge and the cognitive process skills. The learning activities and assessment were elaborated in detailed on the basis of objectives of the module. The lesson transcripts were developed accordingly and given as appendix - XIV.
Plan of Analysis of Marketing Management - Module 1
(Markets, Marketing, Selling, Marketing Management, Meaning and its effect on Marketeers, Consumers and Society)

<table>
<thead>
<tr>
<th>The Knowledge Dimension</th>
<th>The Cognitive Process Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Remember 2 Understand 3 Apply 4 Analyse 5 Evaluate 6 Create</td>
</tr>
<tr>
<td>A. Factual Knowledge</td>
<td>Activities for Objective 1</td>
</tr>
<tr>
<td>B. Conceptual Knowledge</td>
<td>Objective 1 Activities for Objective 1 Assess 1</td>
</tr>
<tr>
<td></td>
<td>Activities for Objective 1</td>
</tr>
<tr>
<td></td>
<td>Objective 3 Activities for Objective 3 Assess 3</td>
</tr>
<tr>
<td></td>
<td>Activities for Objective 1</td>
</tr>
<tr>
<td></td>
<td>Objective 3 Activities for Objective 3 Assess 3</td>
</tr>
<tr>
<td>C. Procedural Knowledge</td>
<td>Activities for Objective 3</td>
</tr>
<tr>
<td>D. Meta-Cognitive Knowledge</td>
<td>Objective 2 Activities for Objective 2</td>
</tr>
<tr>
<td></td>
<td>Activities for Objective 2&amp;3 Assess 2</td>
</tr>
<tr>
<td></td>
<td>Objective 2 Assess 4</td>
</tr>
</tbody>
</table>

Objectives
1. To understand the meaning of markets, marketing management, marketing and selling, its differences and the classification of markets.
2. To understand and evaluate the influences, markets and marketing have on students’ senses and how those influences work on them.
3. To evaluate the role of marketing from the point of view of marketeers, consumers and society.
4. To create and carry out social intervention programmes for overcoming issues of excessive consumerism.
Based on it, a detailed module was framed which consisted of a title, theme, key issues to be addressed, objectives to be achieved, types of knowledge to be constructed, learning activities, cognitive process skills, assessments and conclusion.

The major points of the plan is detailed below.

1. Types of knowledge and cognitive process skills

The lesson transcripts were developed in such a way that the knowledge to be constructed by the students was classified into factual, conceptual, procedural and meta-cognitive. The process skills to be developed among students were also noted in the lesson transcripts.

2. Learning activities

The investigator prepared the learning activities on the basis of critical pedagogy combined with constructivist approach using Yager’s Constructivist Model and Revised Bloom’s Taxonomy.

3. Assessment and feedback

A number of assessment tasks were included so that students could learn from experience. The responses of the students should be observed by the teacher and the feedback of the peers and the teacher were noted in the lesson transcripts.

The initial draft of the lesson transcripts was submitted to the experts and supervising teacher for evaluation. They suggested the following modifications, to make it more learner friendly.

a. More learning experiences are to be provided from the social realities of the students.
b. More learning experiences are to be provided to cater for the needs of all students

c. Scope for critical questioning and critical thinking may be increased

d. More chances may be provided for sharing the experiences of learners and for reacting to the injustices existing in society.

The modules were modified accordingly.

4.7.6 Techniques used for preparation of Lesson transcripts

Two Focus group discussions were carried out for drawing out an outline of content of the unit concerned which is given below.

4.7.6.1 Focus Group Discussion - 1

A Focus Group Discussion consisting of experts and experienced higher secondary teachers of commerce for fixing the themes in the unit and for integrating the pedagogy which incorporates the features of constructivism and critical pedagogy with content, was conducted by the Investigator.

A Focus Group Discussion is a form of qualitative research tool in which a group of people are asked about their perception, opinion, belief and attitude towards a product, service, concept, advertisement, idea or packaging. Questions are asked in an interactive group setting where participants are free to talk with the other members of the groups. Focus groups are powerful means to evaluate services or to test new ideas. It is a valid and reliable technique for collecting data.
The Investigator organised the focus group discussion in order to:

1. Discuss and identify the problems that the teachers face in adopting a pedagogy to suit the needs of society with the existing curriculum.

2. Discuss the challenges that the Investigator faced during the research and for eliciting suggestions for fixing the themes, for locating the social issues/pedagogic issues connected to the unit and learning strategies for transacting the unit.

Eight members participated in the focus group discussion. The group included an expert on the subject, six higher secondary commerce teachers and the Investigator. The discussion started with the presentation of the objectives of the discussion. It continued with the discussion on the problems that the teachers face in adopting a pedagogy to suit the needs of society with the existing syllabus. The Investigator has noted the major points and then presented the challenges about the research and gave a detailed presentation of the features of constructivism and critical pedagogy. The expert gave suggestions on how to fix the themes and the pedagogy to be used for transacting the unit concerned in order to meet the social objectives of education. The subject teachers opined the learning strategies and the themes be included in the syllabus that it would make the students become creative and critical in their thinking and help them live as social beings. The group discussed the scope of implementing critical pedagogy combined with constructivist pedagogy for learning this unit. Several valuable points that are helpful for the study have emerged during the discussions.
4.7.6.2 Focus Group Discussion - II

The Investigator organised a Focus Group Discussion consisting of parents, teachers and students to know the locale of the students and the social issues concerned with marketing existing in their locality in order to;

1. Discuss and identify the key issues concerned with marketing existing in students’ locality.

2. Discuss linking the classroom processes with the community to close the gap between textual knowledge and real life knowledge.

3. Discuss the challenges that the Investigator faced during the research and for eliciting suggestions for improvement.

26 members who participated in the focus group discussion which includes parents, teachers and students. The discussion started with the presentation of the objectives. The discussion focussed on the following specific points.

1. Views about markets and marketing in the present scenario

2. Influence of markets in the daily lives of the students’ family

3. Why markets become unethical

4. Are markets a blessing or curse to the consumers

5. The impact of advertisements in the lives of the students

6. Whether markets promote over-consumerism

7. Whether marketisation aims at caring for the common good

8. Opinions about addressing the above components in the unit of marketing management and the need for the students to be aware of building up a value based society.
The discussion continued for two hours. The Investigator raised questions for discussion. Challenging presentations were done by the parents, teachers and the students.

The parents expressed their opinions about the above points. That helped to sort out the social problems existing in their locality. The teachers expressed their suggestions on how to make use of learning strategies especially those strategies which include working with community. Students realised the need for learning all these aspects for building a value based society. The lively discussion helped to emerge valuable points which were given under the following heads.

1. Key issues concerned with marketing existing in the locality of students.
2. Linkage of classroom processes with the community.

After collecting the content materials from the above sources, the Investigator prepared the outline of the content and organised it logically and psychologically.

### 4.7.7 Lesson transcripts based on Activity based approach

Activity based approach purports that learning is taught and it purely depends on syllabus. Scope for creativity or critical thinking on the part of students is little in this approach. The topics and the learning objectives are the same that is taught through critical pedagogy combined with constructivist approach. The students were taught the objectives through teacher-directed practices, activities or lectures with a little group work. Here the teacher follows a banking method in his pedagogy. In his ‘Pedagogy of the Oppressed’, Paulo Freire has expatiated at
length on the banking approach. In this approach, the teacher is the key figure, planning, deciding how and what the students should learn, while the students play a passive role in obeying, following and memorising. The teacher is seen as possessing all essential information, while the pupils are regarded as empty vessels needing to be filled with knowledge. The banking approach is so widespread in system of teaching practised today that even when, with the best of intentions a holistic approach is attempted, there is a tendency to slip back into traditional teaching methods. So the present learning practices is based on activity based approach, without changing the curriculum and lack of self support systems and monitoring. The classroom transactions focus on teacher-directed strategies with a little effort of group work. The lesson transcripts comprises objectives and learning process.

4.8 Data Collection Procedures

After finalising the sample and the tools to be used, the Investigator approached the authority of the schools to seek permission for conducting the study. The Investigator met the principals of the schools and class teacher of the respective classes and had discussion with them. The teaching and testing took place during the month of November and December 2010 and January 2011. The tools, techniques and materials were administered through three phases namely,

1. Pre-testing
2. Treatment
3. Post-testing
4.8.1 Pre-testing Phase

In this phase, the tools were administered for collecting data regarding the dependant variables such as academic achievement, retention and social and emotional skills.

The Investigator gave a short introduction of the purpose and scope of the study to the students for ensuring full cooperation from them. The students were requested to adhere strictly to the directions and procedures given in the manuals.

The following steps were followed for administering test.

1. Distribution of printed test booklets to the subjects together with direction regarding the test.
2. Explaining the general directions in the booklet
3. Distribution of answer sheets with necessary directions for writing the answers.
4. Clearing the doubts of subjects, giving directions regarding the time of test, mode of entering responses/writing answers.
5. Collection of test booklets and response sheets/answer sheets after the allotted time of test.

The Investigator administered the pre-test to experimental and control groups for collecting data regarding the dependant variables such as achievement and social and emotional skills by using the following tools.
4.8.1.1 Achievement Test - I (Fixed Response Type)

These achievement tests were developed for the study based on the unit “Marketing Management”. These tests were administered to 140 students of the schools selected representing both experimental and control groups. The scoring of answer sheets were done on the basis of the score key prepared by the Investigator.

4.8.1.2 Achievement Test - II (Free Response Type)

These achievement tests were developed for the study based on the unit “Marketing Management”. These tests were administered to 140 students of the schools selected representing both experimental and control groups. The scoring of answer sheets were done based on the assessment criteria prepared by the Investigator and scrutinised by the experts of the subject.

4.8.1.3 Social and Emotional Skills Inventory

This Inventory was developed for the study for the purpose of helping participants to reflect on their own social and emotional skills before the treatment given. It was administered to 140 students of the schools selected for study.

With the full cooperation of the subject teachers of the schools selected, the Investigator implemented the tests. It took three days to complete the work in each school.
4.8.1.4 Prerequisite Test and Compensatory Learning Programme

A pre-requisite test was developed and administered by the Investigator in order to assess the entry behaviour of the students. Based on the results, a compensatory learning programme was carried out to ensure the attainment of all the identified pre-requisites needed for learning the topic selected. Three periods were utilised for this programme. The strategy adopted for classroom transaction includes group discussion and brainstorming session. Before starting treatment phase the Investigator ensured the attainment of the prerequisites by all students.

4.8.2. Treatment Phase

The experiment was conducted in normal classroom setting. 4 modules were developed. Transaction of lesson transcripts and formative assessments were done in this phase.

4.8.2.1 Transaction of Lesson Transcripts in the Experimental Group

The Investigator is working in SCERT as an academician in the field of commerce at higher secondary level. The classes were taught in the experimental group by the investigator with the lesson transcripts developed. The experimental group was taught through critical pedagogy combined with constructivist approach. As part of revision of curriculum at school level, the Investigator attended various workshops and seminars on constructivism and critical pedagogy at the National and State levels. Therefore it is assumed that the Investigator is knowledgeable on constructivism and critical pedagogy. In the experimental group the teacher follows a problem solving approach in which the teacher has to provide a
framework for thinking to the students, to consider a common problem and search for solutions to this problem. Then the teacher raises questions: why, how and who. The students are led to be active, describing, analysing, suggesting, deciding and planning.

The teacher should be a social integrator and has to take the role of an animator (one who brings the group to life) or a facilitator (one who makes it easier for the group to discuss and plan fruitfully). The teacher has a special responsibility to stimulate students to think critically, to identify their problems and to find new solutions to these problem. In the experimental group, peer learning, collaborative learning and inquiry based learning were promoted. Strategies like debates, seminars, projects especially community service projects, exhibition, assignments and social intervention programmes were carried out for effective classroom transaction.

After explaining the characteristics of the research to the students and teachers in detail, 32 periods of actual teaching was initiated, including formative assessment. Twelve out-of-class hours were utilised for social intervention programmes and community service projects in the experimental group. This teaching practice took place during the months of November and December 2010 and January 2011. The Investigator undertook the lessons in experimental group in tune with the objectives of the lessons. In the experimental group, the activities were developed after getting a feedback about the background of the students. Activities aimed at discovering what the students know and want to know were given priority when they were shared with the class. Other activities that are mentioned in the lesson transcripts and which were relevant to the topic were
undertaken. These activities were carried out on the groups that were precisely established. After each group completed its work, a class discussion on the group work was undertaken and relationships with the realities of life were established. In this manner students were given opportunities to voice their own views in the class. Activities varied according to topics. Students were given chances to classify, hypothesise, examine reports and indicate their opinion regarding the topics.

### 4.8.2.2 Transaction of Lesson Transcripts in the Control Group

The classes were taught in the control group by the Investigator with the developed lesson transcripts. The control group was taught through activity based approach following lecture method with a little effort of group work. The activities and examples given in the sourcebook and textbook prescribed for State Syllabus were made use of in the classes of control group. 32 periods were utilised to transact the same topics in control group also. This teaching practice took place during the months of November and December 2010 and January 2011. The Investigator undertook the lessons in control group in tune with the objectives of the lessons.

### 4.8.2.3 Administration of Formative Assessment Tools

Peer assessment, teacher assessment and self assessment tools were administered for assessing higher order thinking skills, social and emotional skills and the concepts related to the topics of study. By asking questions, assessment by rubrics, portfolio assessment and scoring guides, the teacher identified the potential of each and every student. To what extent the students attained the
process skills and the concepts of each sub-unit have been noted down individually in the record of the teacher. The feedback of the classes taken was noted down in the lesson transcripts itself.

Class discussions provided useful information as to whether the students had grasped the objectives. The Investigator monitored the involvement of the students while working in groups. The observation was a true indicator of their progress. The products of students such as worksheets, assignments, data collected as part of this study made the Investigator to undertake assessment tasks fruitfully. A record of each students’ effort in this regard is kept with the distinction of performance. The reflections of the students throughout the unit, peer assessment and self assessment of students helped the Investigator to do final assessment. The scaffolding given by the teacher, executing more activities, changing the instructional strategies, the collaborative nature of learning, and the portfolio assessment made all students to actively engage in the process of constructing meaning. Thus constructivist learning (or otherwise called meaningful learning) is ensured among all students with the attainment of the process skills and the concepts after each unit. Assessment as learning and assessment for learning go hand in hand with teaching.

In the formative assessment, a criteria was fixed at 80% attainment of cognitive process skills and the concepts for the purpose of achieving the objectives fixed for each module. For the assessment, the investigator used tests, rubrics, student portfolio and scoring guides. Teacher assessment, peer assessment and self assessment helped the Investigator to consolidate the grades for ensuring the achievement of students. The structure of grading followed for formative assessment is given in table 4.20.
Table 4.20

The Structure of Grading for Formative Assessment

<table>
<thead>
<tr>
<th>Grades</th>
<th>Percentage of score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>80% and above</td>
</tr>
<tr>
<td>A</td>
<td>70% to 79%</td>
</tr>
<tr>
<td>B+</td>
<td>60% to 69%</td>
</tr>
<tr>
<td>B</td>
<td>50% to 59%</td>
</tr>
<tr>
<td>C+</td>
<td>40% to 49%</td>
</tr>
<tr>
<td>C</td>
<td>Below 40%</td>
</tr>
</tbody>
</table>

Enrichment activities were given in the form of assignments and projects for gifted students. Those who had not reached the A+ grade were given chances to undergo individual guidance given by the teacher. Also heterogeneous group of students consisting of average, below average and above average students were formed and peer learning was promoted. Peer tutoring was also implemented to help weak students improve their performance. Necessary recaps were done by the teacher after each sub unit.

Students were given chances to know the weak area of the processes needed to acquire the concepts and its application in unfamiliar situations through the intervention made by the teacher throughout the classroom transaction and while going through the products (outcome) of learning. Students were also given chances to go through their mistakes and to modify their products of learning.

4.8.3 Post Testing Phase

At this stage students of both experimental and control groups were underwent post test of achievement and social and emotional skills, which are given below.
4.8.3.1 Achievement Test - I (Fixed Response Type)

These achievement tests were administered to 140 students of the schools selected representing both experimental and control groups. The scoring of answer sheets were done on the basis of the score key prepared by the Investigator.

4.8.3.2 Achievement Test - II (Free Response Type)

These achievement tests were administered to 140 students of the schools selected representing both experimental and control groups. The scoring of answer sheets were done based on the assessment criteria prepared by the Investigator.

4.8.3.3 Social and Emotional Skills Inventory

This Inventory was administered to 140 students of the schools selected for study with the full cooperation of the subject teachers of the selected schools.

4.8.3.4 Retention

The post test of both achievement tests were administered again to 140 students of schools selected after a time gap. The method used to measure the retention is to test the students at the end of the treatment phase and then retest them after twenty days. In this study, in order to compare the retention score of two groups, each student got a pair of scores. From these scores retention score is calculated for each student using the formula

\[
\text{Retention score} = \frac{\text{Scores obtained in the 2\textsuperscript{nd} test}}{\text{Scores obtained in the 1\textsuperscript{st} test}} \times 100
\]
4.9 Statistical Techniques Used for Analysis

The main objective of the study was to compare the effectiveness of critical pedagogy combined with constructivist approach and activity based approach in learning commerce at higher secondary level. The initial status of both experimental and control groups was determined by pre-test scores in a pre-test post-test study. Difference in the initial status of the groups can be removed statistically so that they can be compared as though their initial status had been equated (Best, 1996). For that Analysis of Co-variance (ANCOVA) can be used. It is a statistical technique which enables the Investigator to equate the initial status of the groups in terms of relevant known variables. In the present study the Investigator decided to adopt Critical ratio (CR) and the technique of ANCOVA as the main statistical techniques for ensuring most accurate results when comparing the performances of both experimental and control groups. The following statistical techniques were used for analysing the data.

1. Arithmetic mean
2. Median
3. Standard deviation
4. Skewness
5. Kurtosis
6. Critical Ratio
7. Analysis of Variance
8. Analysis of Co-variance

The details of analysis of data using relevant statistical methods have been dealt with in chapter V.