PREPARATION AND TESTING OF TEACHING MODULES FOR INSTRUCTION IN HINDI LANGUAGE AT SECONDARY LEVEL

Thesis submitted for the award of the degree of

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IN
EDUCATION

By

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CERTIFICATE

I, Dr. K. Karunakaran, do hereby certify that this thesis entitled **"PREPARATION AND TESTING OF TEACHING MODULES FOR INSTRUCTION IN HINDI LANGUAGE AT SECONDARY LEVEL"** is a record of bonafide study and research carried out by **Smt. Remani V.N**., under my supervision and guidance.

Calicut University Campus,
11-07-2008.

Dr. K. KARUNAKARAN
(Supervising Teacher)

DECLARATION

I, Remani V. N., do hereby declare that this thesis entitled **"PREPARATION AND TESTING OF TEACHING MODULES FOR INSTRUCTION IN HINDI LANGUAGE AT SECONDARY LEVEL"** submitted to the University of Calicut for the award of the degree of **Doctor of Philosophy in Education** has not been submitted by me fully or partially for the award of a degree, diploma, title or recognition before.

Calicut University Campus,
11-07-2008.

Remani V.N.

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INTRODUCTION

Chapter I

INTRODUCTION

The importance of the role of teachers is becoming wider and wider in the modern world of science and technology. The world is fast developing in the field of communication and information. All phases of the world such as industry, agriculture, trade and business etc. are subject to changes, where education is not an exception. Though unimaginable development and application of modern equipments and electronic instruments like computer, VCD etc. could supplement the process of teaching and learning, the teacher cannot be replaced by any of the facilities and amenities available in the era of modern age. But all these can influence, no doubt, the efficiency and proficiency of teaching and learning. As such in commensurate with all these changes, influences and effects the ability of the teachers should be elevated and updated. Teachers in all subjects are to be equipped with modern techniques and methods of teaching learning process to overcome the modern scenario. In this connection the teaching process and activities of languages also need innovative changes.

As far as psychologists and educationists are concerned the education system must be more accountable and qualitative. To attain this objective, the teachers should be dedicated and enthusiastic in imparting instruction as only self motivated teachers can motivate learners to learn. In order to attain the coveted goal the teacher should ensure the wholehearted participation of the students. As such language is the only vehicle for communication by which ideas and meanings are conveyed.

The study of language as a discipline has kept pace to some extent with the growing recognition of its importance. For languages other than mother tongue, the acquisition is difficult to some extent. To acquire proficiency in any language, one need to use it meaningfully. In other words one should communicate it effectively. For this, the person must possess certain pre-requisites like knowledge of language elements and certain abilities. The acquisition of the ability to use a language proficiently other than mother tongue, systematic practice is inevitable. If actual language situation and environment are provided second language acquisition is possible in an easy way.

As a result of the efforts made by experts in languages and linguists, the teaching of a language other than mother tongue has got a momentum leading to progress in learning. In order to make the process of learning more effective planned methods and practices including drills are essential ingredients to inculcate the learners and to acquire the concept of learning and understanding its meanings and ideas. Hence proper and suitable classroom situations are to be created by the teachers in order to help the learners acquire the techniques as well as modalities of learning the language. But in the case of mother tongue, natural situations help the learner to learn himself/herself. As far as Hindi, as a second language, is concerned, majority of the teachers is not seen successful in creating effective methods for teaching the language. In this circumstance the authorities, in view of the experts' opinion, organized and conducted a

number of orientation courses, workshops and seminars for the benefit of teachers. But the attempt could not find the expected results. Hence the investigator proposed to prepare modules in Hindi and to adopt modular approach in teaching with a view to measure the effect on achievement among secondary school students.

IMPORTANCE OF HINDI AS SECOND LANGUAGE

Every one need to have a working knowledge of Hindi because, it is our national language. Article 351 of the constitution says that, "it shall be the duty of the union to promote the spread of Hindi language." The progress of the Nation is mainly depending upon the development of National language. The National Policy on Education (1986) suggested "learning of Hindi" should be given prime importance in our education.

In the schools of Kerala Hindi is being taught from 5th standard and continues upto 10th standard as a third language. Languages other than mother tongue is considered as second language in higher education level. But in the schools of Kerala, Hindi is being taught as third language. As far as the investigator is concerned Hindi is considered as one of the second languages for the present study.

Problems Involved in Teaching Hindi

The teachers who are handling the language should be aware of the nature and the way by which it is taught and learned. The methods of teaching language will differ according to the interest and aptitude. In this

connection it is pointed out that language teaching during the last few decades has been ineffective, to a certain extent, due to lack of proper understanding of the way in which the language is being inculcated. As a result, the teachers began to feel the use of effective methods of instruction in teaching Hindi. This view is supported by the following remarks. “Teaching is a process of building communication of learners who use their skills to educate themselves” (Joyce and Weil, 1992).

The change in the teaching, learning process has to begin from the initial stage. The major purpose of teaching is to help the learner to learn and then to increase the capacity of the learners to learn. Nowadays, the instructional strategies have become learner oriented. In the learner centred approach, the entire learning process is in accordance with the needs, problems, interest, capabilities and attitudes of the learners. Here the ‘learner’ and ‘the learning’ are the key words that are given importance. The teachers’ role reduced to function as the ‘facilitator’ of the learning process. The role of the teacher is to help the pupils learn ‘how to learn’. Learning has to satisfy the needs of the individual leaner rather than the group as a whole.

A person can learn mother tongue without much effort. In the case of a foreign language, a person acquires language skills on the basis of the language he has acquired and developed. If a situation can be associated with words, the learner will realise the meanings and connotations attached with those words.

Status of Hindi in the Present School Curriculum

In Kerala, at the school level, Hindi is being taught from standard 5th onwards. The periods allotted for teaching Hindi is limited to three periods per week. The failure of students in Hindi at the S.S.L.C. level is very high. The teachers need to understand the reasons in depth and have to find out remedial measures for the massive failure in Hindi. According to the traditional method, Hindi is being taught in classrooms through translation method. After six years of learning Hindi, the students are unable to develop the four basic skills expected of language learning ie., Listening, Speaking, Reading and Writing (LSRW). This may be attributed to the inappropriate teaching learning process followed in our secondary schools.

The teaching of Hindi in our schools is based on pupil-teacher interaction. This pupil teacher interaction is based upon the textual content in the form of class-wise teaching units. The entire lesson is divided into small units and taught to the pupils. The assessment is also done unit-wise. Many of the teachers are of the opinion that the learners will lose continuity from one unit to another. If an overall continuity in the form of Gestalts are arranged in the properly attempted units prepared, students will find grasping of the subject easier and will ensure continuous motivation to learn the language further.

Relevance of Modular Approach in Teaching Hindi

In the transaction of Hindi as a language, the teachers face many problems. They need a simple and easy way of language teaching in order to

ensure effective acquisition of language. The structural approach to Hindi language learning has been substituted by meaningfully focused learner oriented approach. But it has not been implemented in its true spirit. Teachers need to implement the principles of individualized instruction in the classrooms.

No two individuals are alike. Each learner has his/her own needs, capabilities and interests. To deal with the different learner characteristics, individualized instruction is an apt learning strategy. The aim of individualized instruction is to make learning self-directed.

There are various types of individualized instruction. Keller Plan (1962) programmed instruction, contract learning, self instructional package and instructional modules of the different individualized instructions.

Modular Approach of Teaching Hindi

A module is a self contained and self sufficient unit of instruction for the learners to achieve a set of objectives. The three basic elements of instruction contained in the module are objectives, learning activities and evaluation. In short a module is self contained and self pacing by nature. The modules help the learners for independent thinking.

The present study focuses upon the effect of modular approach in teaching on the achievement of Hindi of the IX standard students of Kerala. The problem was selected by keeping in mind the present status of Hindi as

third language in school curriculum and the relevance of module in teaching of Hindi.

Every teacher has to plan and prepare well to create an atmosphere conducive to the learning of Hindi according to the level of students. Hindi should be taught through Hindi; so that the learners will acquire language skills in a natural way. The central idea about the module preparation is to help the teachers to teach effectively. This indicates the need for teachers to prepare modules keeping in mind the learning theories, interest of the students, aptitude towards language, instructional objectives and activities. In view of the above, the investigator proposed to prepare modules so that the teachers may be made aware of it and to enhance the achievement in Hindi among secondary school children and hence the study.

Need and Significance of the Study

Hindi is usually taught in schools in translation method. As a result the understanding of language takes place through the mother tongue. It is a fact that the mother tongue is the foundation on which the strong pillars of any other languages are built up. But on certain occasions the interference of mother tongue affects negatively in the acquisition of foreign languages. Hence the investigator made an earnest effort to teach Hindi in Hindi medium with the help of modules with a view to measure achievements in acquisition of Hindi.

The investigator has been working as a Lecturer and teacher educator for the last 27 years and thus she has rich experience in linguistic problems

of students in terms of vocabulary, grammar and language skills. This may be due to the fact that the earlier experience of students in learning Hindi caused the deficiency referred. Hence the investigator proposed to measure the effect of modular approach in teaching Hindi with that of traditional method to differentiate the problems and its magnitude.

The investigator thought of this problem in depth and discussed in detail with her colleagues and other teachers handling Hindi at different levels. It was found out that the teachers in general need guidance for adopting better methods. The only available materials with them are the text books prepared and prescribed by the authority and the orientation programmes given to them. The investigator interviewed some of the parents and the responses received from them were equally supporting to the problem. Many of the parents were not functionally aware of Hindi, though the television exerts a great influence on them. Through the discussion with the high school students, it was revealed that there exists a wide gap between the expected outcomes and the attained outputs in the acquisition of Hindi as a third language in secondary schools.

All these issues convinced the investigator that something has to be done urgently to rectify these defects and vitalize Hindi education in secondary schools. So a plan of action for developing self contained teaching modules with a view to throw light into the problems that are faced by the teachers and students in the skill acquisition of Hindi. Hence the

investigator proposed to analyze, categorize and synthesize the problems faced by the teachers of Hindi and to conduct the study.

STATEMENT OF THE PROBLEM

The present investigation is intended to develop modules for teaching Hindi with a view to identify its effectiveness on achievement among secondary school students. Hence the study is entitled as "**PREPARATION AND TESTING OF TEACHING MODULES FOR INSTRUCTION IN HINDI LANGUAGE AT SECONDARY LEVEL**."

DEFINITION OF KEY TERMS

Operational definitions of the key terms are given below:

a) Preparation and Testing

These terms refer to the development of instructional modules and their tryout for validation. According to Oxford Dictionary (1989), development is a gradual unfolding or a fuller working out of the details of anything. Here the investigator prepared modules based on the three lessons in the IXth standard text book. Then she handled classes for both groups, ie. 'Experimental' and 'Control' groups. Experimental group was instructed through modular approach and control group was taught through traditional method. After the completion of the classes she conducted the same test to both groups to assess the difference of achievement.

b) Module

A module is a short unit of instruction dealing with a single conceptual piece of subject matter. In this study the investigator divided lessons in to different pieces according to convenience and meaningful units to provide a concept or idea.

c) Secondary Level

Students attending classes VIII to X in the schools approved by the Department of Education, Government of Kerala. In the present study, standard IX was considered.

VARIABLES OF THE STUDY

Variables are the conditions or characteristics that the experimenter manipulates, control or observes. In the present investigation there are two variables - Independent Variable and Dependant Variable.

Independent Variable

The independent variables are the conditions or characteristics that the experimental manipulates or controls in his or her attempt to ascertain their relationships to the observed phenomena. In the present study, Modular approach and existing method of teaching are the independent variables.

Dependent Variables

The dependent variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes or

changes the independent variables. Here the achievement test scores in Hindi are the dependent variable.

OBJECTIVES OF THE STUDY

The major objectives formulated for the present study are:

a) To develop instructional modules in Hindi for secondary school students.

b) To compare the effectiveness of the modules in Hindi with that of the conventional method of teaching Hindi for secondary school students in terms of achievement.

c) To compare the effectiveness of the Modules in Hindi with that of the conventional method of teaching under the different levels of objectives propounded by Bloom, viz.

    1) Knowledge
    2) Understanding
    3) Application

d) To find out the effectiveness of the modules in Hindi language achievement of secondary school students at different levels of intelligence.

    1) High
    2) Average
    3) Low

e) To find out the effectiveness of the modules in Hindi on the language achievement of IX standard students belonging to different levels of SES:

1) High
2) Average
3) Below Average

HYPOTHESES

i) There will be significant difference in the Hindi language achievement of secondary school students taught under module and through the conventional method of teaching.

ii) There will be significant difference in the Hindi language achievement of secondary school students when taught through modules and conventional method of teaching under the three objectives.

iii) There will be significant difference in the Hindi language achievement of secondary school students when taught through modules and conventional method of teaching at different levels of intelligence.

iv) There will be significant difference in the Hindi language achievement of secondary school students belonging to different SES when taught through modules in Hindi and conventional methods of teaching.

RESEARCH DESIGN

The investigator adopted ‘pre-test’ ‘post-test’ design control group for the present study. The sample for the present study is selected based on the random sampling technique and further equated on the basis of socio-economic status, intelligence and previous academic achievement to form the Experimental and Control Groups.

The present experimental design has seven phases:

Phase	I	Analysis of the curriculum materials of Standard IX.
Phase	II	Study the principles adopted for the development of models
Phase	III	Preparation of Modules based upon the select lessons
Phase	IV	Identifying and equating the sample for experimental and control groups
Phase	V	Applying modular approach in teaching to Experimental group
Phase	VI	Applying Existing Teaching Method in Control Group
Phase	VII	Evaluation of outcomes through the administration of the same achievement test to both groups prepared and standardized by the investigator.

PROCEDURE ADOPTED FOR THE STUDY

At first the investigator prepared a questionnaire on the various aspects of the problems faced by Hindi teachers at secondary level by taking into consideration all the parameters involved in the curricular transactions. Then the questionnaire was discussed in detail with experts. Taking into

consideration, the suggestions put forward by experts, the investigator confined the questionnaire on secondary level curriculum. The questionnaire was further modified and was ready for administration. The investigator collected and categorized responses from twenty teachers working in Payyannur Municipality. All the twenty respondents unanimously opined that the teaching of Hindi needs modification and it should be according to local situations. Hence the investigator proposed to develop instructional modules in Hindi meant for Standard IX by keeping in tune with the principle of module preparation. Then the investigator identified two groups ie. Experimental and Control groups by equating socio-economic status and intelligence. Then she herself handled classes to both groups in modular approach and traditional method of instruction.

TOOLS USED FOR THE STUDY

1. Questionnaire developed by the investigator for gathering views of teachers and parents.
2. Modules for instruction prepared by the investigator.
3. Raven's standard progressive matrices to test intelligence.
4. Socio-Economic Status Scale
5. Achievement test in Hindi.

SAMPLE

The sample selected for the experimental study was 100 students of IX standard of Kannur district. The sample was divided into two homogenous groups. The experimental and the control group with 50 students each.

STATISTICAL TECHNIQUES USED

1. Descriptive statistics such as mean, median, mode, standard deviation, skewness and kurtosis.
2. Test of significance of difference between the means of experimental and control groups.

SCOPE AND LIMITATIONS

Self learning materials have to be developed in line with the effective instructional strategies adopted by teachers. The instructional modules developed by the investigator help the teachers to teach in a better way. Through this the learners get maximum benefit.

Nowadays the scope of open schools and open learning have become very popular. Teacher education courses are being provided through open learning. At this situation the scope of modules for instruction is very high.

The weightage to teaching and testing in terms of instructional objectives was provided to see that both teaching and testing go hand in hand.

The limitations of the present study are listed below:

1. The module is meant for the teachers only.
2. The content chosen is IX standard Hindi text book.
3. For conducting the experiment a group of pupils from a single district alone is considered. Among the cognitive objectives only knowledge, understanding and application were considered.
4. Study was confined only to IX standard students. This is because IX standard represents the totality of the secondary level.

ORGANISATION OF THE THESIS

Chapter One

This chapter includes introduction, importance of learning Hindi language, need and significance of the study, statement of the problem, definition of key terms, objectives and hypotheses, a brief description of the methodology adopted, scope limitation and statistical techniques used in the study.

Chapter Two

This chapter gives a detailed account on the theoretical background of Modular Approach, definition of Module, components and development of modules, advantages and limitations of modular approach.

Chapter Three

A detailed survey of related literature to the present investigation has been included in this chapter.

Chapter Four

This chapter describes the methodology adopted for the present study, the variables used, selection of sample, tools for collection of data and statistical techniques adopted.

Chapter Five

Chapter five deals with the modules prepared by the investigator intended for teachers who are handling the classes.

Chapter Six

Analysis of interpretation of data and major findings have been included in this chapter.

Chapter Seven

This chapter gives the summary of the study, conclusion, recommendations and suggestion for further research.

Bibliography, tools etc, are also appended.

CHAPTER II

THEORETICAL OVERVIEW

CHAPTER III

Chapter II

THEORETICAL OVERVIEW

EDUCATIONAL TECHNOLOGY

The classroom instruction has been revolutionized because of the influence of technological developments. The application of technological devices in teaching and learning lead to the evolution of a special branch named ‘Educational Technology’. Educational technology is the science of techniques and methods by which educational goals could be realized (Shiv K. Mitra, 1968). In other words it refers to the use of techniques and methodologies in teaching learning process. Educational technology combined with the psychological principles have paved the way for the emergence of various innovative instructional practices.

Teaching technology is a sub system of educational technology. It is concerned only with the theory and practice for the teachers to improve their teaching performance. Here comes the importance of individualized instruction. The present era has given us a new outlook on the basic building blocks of instructions. The term ‘instructional module’ become a synonym for the free-standing instructional units.

MODULAR APPROACH

A module is a subsystem of an instructional programme. It is complete in itself by providing desirable learning experiences to the learners. A module represents a way of planning in which the whole curriculum is

divided into meaningful units. The sub parts of the modular units depend on the class, size and length of the period.

An instructional module is a self contained self sufficient unit of instruction for the learner to work for achieving a set of pre-determined objectives. A module has three related basic element of instruction which are objective, activities and evaluation. The principle behind instructional module is that, each learner is individual in his experience, potentialities, habits and learning style. Each person should be allowed to grow and develop in tune with his fullest potential.

Modular approach of instruction is an instructional programme in which modules are being used for instruction. This approach is an effective and economic way of developing specific items of knowledge and a skill with minimum of teacher's authoritative direction. Modules can be prepared in different forms. They can be in written or in the form of slides, tapes or pictures.

Definition of Module

Buch and et al. (1978) – 'Module is a self-contained and self sufficient instructional unit.' International Encyclopedia of Education (1994, p.3886) "A module is a unit of curricular material, complete in itself, to which further units may be added for the achievement of larger tasks for more long term goals."

Meyer (1975) “Module is a self-contained semi-programmed and self-paced unit of work designed to achieve highly specified objectives in a short span of time usually a few days or less.”

Murray (1971) - Module is a self contained and

of instruction with a primary focus on a few well-defined objectives.

Russel (1974) – “Module is a short unit of instruction dealing with a single conceptual unit of subject matter.”

Components of a Module

The book “Developing Instructional Modules for Teacher’s Directions” by UNESCO specified the components of a module. It is given below:

1. Title

The module needs a title and it must be clear and concise.

2. Introduction

A proper introduction is essential. It should give the back ground and rationale of the module along with the target population for whom the module has been developed.

3. Overview

The overview introduces the theme of the module. It also gives an idea of the purpose, structure, organisation and uses of the module.

4. Instructions

Proper instructions are given to the learner. It gives an idea about how he should proceed and what the learner has to do at each stage. These instructions help for self-learning.

5. Pre-test

A pre-test is given to the learner at the learning. This helps to find out the level of knowledge and skill that the learner already has.

6. Objectives

The instructional objectives of the modules should be clearly stated. They specify the expected learning outcomes in terms of behavioral changes.

7. Learning activities

A lot of learning activities are provided in a planned and sequentially arranged manner. These activities enable the learner to develop behaviour in a pre-determined direction.

8. Formative tests

At the end of each learning unit, formative tests are given. This helps the learner to know whether he has achieved the expected behaviour outcomes.

9. Summative evaluation

With the help of pre-test, the summative evaluation is done. The final test helps the learner in knowing how well the learner has attained the expected learning outcomes.

Development of Modules

Module is a innovation of educational technology and it captured the attention of the educationists at the beginning of the present decade. Module development needs expertise and thorough practice. A large number of modules have been prepared at USA and Asian countries. The utilization of these modules in real classroom situation is very limited. This is because the prepared modules were fragmentary in nature. Attempts were not done to cover the whole syllabus. In India, UGC has completed the work of presenting the curriculum in modular form at the undergraduate and postgraduate levels in education (1991).

The Stages for the development of modules

These are three different stages for the development of modules. They are:

1. Planning stage
2. Drafting stage
3. Revising stage

1. **Planning stage:** At this stage, the target group is fixed and the manner of administration is also identified. All the prerequisites of the target population are also assessed in this phase.

2. **Drafting stage:** The objectives of the module is formulated at this stage. Proper learning experiences according to the objectives are also formulated. Modules are prepared for the learners to learn at their own pace.

3. **Revising stage:** At this stage, modifications are done. This modification deals with reducing or adding of objectives, arranging and organization of content, correction of language and assessment of items. These modules are then used in an initial try out for further modification.

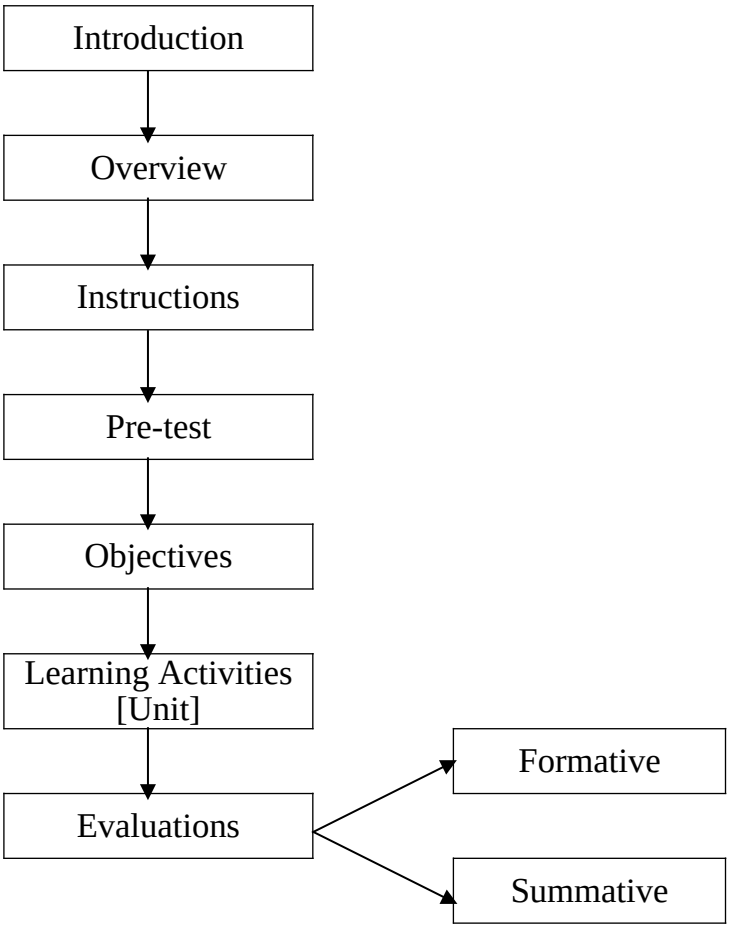
Though the tryout, the efficacy of the modules in terms of readability, difficulty level and content organization can be made. The adequacy of the test items also can be checked and learning activities and sequences of instructions can again be revised. Thus the modules are ready for experimentation.

The module thus prepared has the following components.

1. Title
2. Introduction
3. Overview
4. Instruction to learners
5. The pre-test evaluation

6. Objectives
7. Learning activities
8. Formative evaluation
9. Summative evaluation

Diagrammatic Representation of the Learning Process of a Module



Merits of Modular Approach

Modular approach helps the learners to develop self study habits with the minimum of teacher's supervision

Advantages to the teachers

1. Modules can be used as models for the teachers to develop their own materials.
2. Can update materials without major revisions
3. Materials can be exchanged between institutions
4. Teachers can find out the deficiencies of the pupils
5. Provides a way to assess students' progress in learning.

Advantages to the students

1. Students can assess themselves
2. They can progress at their own pace, because they have full control over the study material
3. Students must be involved completely in the learning process
4. This helps to develop a sense of responsibility for one's own learning
5. Students can take the modules to their home
6. The consequences of failure are reduced.

Each student can master each module completely before proceeding to the next.

Limitations

Though modules are very useful, they have so many limitations too. Some of them are mentioned below:

1. If the prepared module is not simple, it will not be effective to the learners.
2. Both teachers and students should be fully motivated.
3. An adequate system for monitoring the progress and recording the achievement is necessary for ensuring effectiveness
4. Module development is very expensive
5. Co-operative learning and co-operation among learners will not take place in modular scheduling.

Conclusion

From the discussion, it is seen that Modular Approach in Teaching is beneficial to the teachers for developing motivation among students. This method can be adopted in almost all subjects and hence accepted tool for effective and systematic instruction.

Based upon the discussions, the investigator proposed to collect the certain empirical studies connected with Modular Approach in Teaching, Academic Achievement, Intelligence and Socio Economic Status, the details of which is presented in the next chapter.

REVIEW OF RELATED STUDIES

CHAPTER III

Chapter 3

REVIEW OF RELATED STUDIES

INTRODUCTION

The review of related literature involves the systematic identification, location and analysis of documents containing information related to the research problems. The review has several important functions that make it well worth the time and effort. The major purpose of reviewing the literature is to determine what has already been done that relates to your topic. This knowledge not only avoids unintentional duplication, but it also provides the understandings and insights necessary to develop a logical framework into which your topic fits. In other words, the review tells the researcher what has been done and, in so doing also suggests what needs to be done. The review of literature is as important as any other component of the research, and it can be conducted quite painlessly if it is approached in an orderly manner.

The investigator made an attempt to collect the details of studies, which are related to the present study. The details are given in this chapter under the following headings.

- Studies Related to Modular Approach
- Studies related to Academic Achievement
- Studies related to Socio-Economic Status and Intelligence.

STUDIES RELATED TO MODULAR APPROACH

Riasat Ali (2005) conducted an experimental study on the Development and Effectiveness of modular teaching in Biology at secondary level. The result of the study indicated that modular approach was more effective instructional paradigm for Biology as compared to the traditional method of teaching. Further, modular teaching appeared more favourably for low-achievers than high-achievers. The results of this study provide base for the application of Modular Approach in the Biology classroom as well as for further research in this field for the further extension of this method to other subjects and levels.

Mony and Thangaswamy (2005) conducted a study on the effectiveness of teaching English through actions and oral practice in primary school. It was found that this group of Standard V students taught through actions and oral practice uses letter in its oral comprehension. English teachers can teach English grammatical features effectively through action and oral practice in primary schools. Teaching through actions and oral practice was found very effective in teaching oral comprehension of English grammatical features and improving the speaking skills of the students.

Kumari (2002) examined the effectiveness of the physics module prepared for Standard XI of Kerala State open school. The major findings of

the study were (1) coverage of the syllabus in the module was satisfactory (2) the physics module was not suitable for self learning (3) the major aims and functions were not satisfied by the module (4) the module was appropriate to the age level of the learners and (5) mode of presentation of module was not satisfactory.

Sunil, Dutt and Divender (2002) conducted an experimental study on the effect of self-learning modules on achievement in economics of senior secondary students. The major findings of the study were:

- Students exposed through self-learning modules were found to achieve significantly higher scores than students taught the same topic through conventional method of teaching.

- Sex accounted for differential achievement in economics. Male students got significantly higher mean post achievement test scores than female students.

- Students belonging to both rural and urban places of residence achieved almost identical mean post achievement.

Alice Ani (1997) prepared an instructional module in Chemistry to find the effectiveness of teacher assisted modular approach on achievement in Chemistry. The findings of her study showed that modular approach is more effective than textbook method. She found that in modular approach the objective knowledge, understanding, application and skill are higher than the traditional approach.

Lilly (1997) measured the effect of module based instruction in the achievement of Hindi language of secondary school students. She prepared instructional module for IXth standard students of Kerala. She made an experimental study with sample of 35 students to measure the effect with that of text book approach on achievement in Hindi and found that module based instruction is more effective than that of text book approach. Considering the level of cognition such as knowledge, understanding and application it is seen that module based approach is more effective than that of text book approach on Hindi achievement.

Abraham, Jolly (1996) prepared an instructional module ‘effectiveness of modular approach on Chemistry achievement in secondary school student. It found that Modular approach was more effective than traditional method.

Varghese, Ancy (1995) designed a module and found its effectiveness by comparing it with traditional text book approach. The results of her study revealed that modular approach is more effective than text book approach. She compared the effectiveness under the categories of instructional objectives knowledge, comprehension and application. She found that at knowledge level both methods are equally good, but at comprehension and application levels the modular approach is more effective.

Marret, Renu (1995) constructed a support study module for learning the occupational aspects of coconut cultivation, at degree level. The

conclusions that emerged out of the analysis of data included the following points:

- Conventional method of teaching was not adequate in developing the skills of B.Sc. Botany students.
- The module prepared was found to be effective in giving students knowledge in an integrated fashion.

Hazeena (1995), made a comparison of modular approach and traditional text book approach in teaching physics. She found that the modular approach is more effective than the traditional text book approach.

Puri (1993) developed improvised science kit and tried out in a few rural as well as urban schools in and around Bathinda in Punjab at Primary level. The children receded positively and gave a good response about the performance of various activities.

Prakash (1993) conducted an experimental study for finding out the effect of guided self study for learning chemistry. This provides a chance to the students to study on their own and get the guidance only when it is needed. It was found that experimental group performed better than the control group.

Mollykutty (1991) conducted an experimental study for finding the effectiveness of modular approach in teacher education and requisites for implementation. The results showed that modular approach is more effective

than the traditional approach. Implementation of modular approach requires more facilities in educational institutions.

Mollykutty (1991) was conducted experimental study to measure the effectiveness of modules self method and found that there is significant difference in the total score of knowledge of the experimental group over control group.

Arunachalam (1991) developed an instructional module in learning of History for students of standard X. The results showed that the experimental group scored high in achievement test. As far as the total group is concerned, the use of instructional module definitely improved their learning of history. Same result is obtained when the objective knowledge, comprehension, application and skill are tested. The study revealed that instructional module is superior to the traditional approach for it contributes to the attainment of knowledge, comprehension, application and skills.

Sansanwal and Joshi (1990) studied the effectiveness of instructional strategy in terms of higher mental ability. An experimental study has been conducted to study the impact of specially designed instructional strategy on higher mental abilities of school children. The specially designed instructional strategy consisted of six components namely, programmed learning materials, experimentation, assignment, and discussion. Sample consisted of 100, class IX students divided into two groups, experimental and control. Post-test results were compared and found that the instructional

strategy developed under the study was found to be significantly superior to the traditional approach to teaching in terms of development of the abilities such as application, analysis, synthesis, evaluation and overall higher mental ability in science.

Santhoshkumar (1990) conducted an experimental study on the effect of teacher assisted modular approach in teaching physics in secondary schools of Kerala State. The study intended to find out the effectiveness of modular approach in teaching physics. The findings showed that the teacher assisted modular approach is more effective than textbook approach for student achievement in teaching physics.

Madhumohan (1990) studied the effect of teacher assisted modular approach in teaching Chemistry in secondary schools of Kerala. The findings of this experimental study revealed that the teacher assisted study module is more effective than textbook approach in the teaching of chemistry in high schools.

Anitha (1989) conducted a study on “preparation of modules for teaching the topic ‘Analysis of Basic Data in Basic Mathematics for Standard VII’.

The main objectives of the study were:

- To prepare a module for teaching the topic. ‘Analysis of Basic Data’, and

- To find out the effectiveness of modular approach in teaching mathematics and to compare the effectiveness of modular approach with the traditional method of teaching.

The findings showed that the modular approach is more effective than traditional method.

Mohammad (1988) developed and evaluated a modularized individualized instruction science course in Kuwaiti secondary school. The purpose of the study was to develop, implement and evaluate a science course in accordance with modularized, individualized instruction principles. Major findings of the study were that modularized, individualized instruction was significantly effective in producing overall achievement.

Ginapp (1985) studied the influence of teacher assessment module tapes on student teacher's performance. The student teachers who viewed and analyzed teacher assessment module tapes (TAMS) developed for use in the project received high rating on an observation instrument by their co-operating and university supervising teachers than students who do not view the tapes. Sample included 80 elementary and secondary student teachers, 80 cooperating teachers and 15 university supervising teachers. Results indicated that students in the experimental group received higher overall ratings by all three rating groups. Significant difference in ratings between experimental and control groups were found by time of last observation period in the ratings by both groups of co-operating and supervising teachers.

Pankiewicz (1984) studied the effects of a self-designed introductory junior high school organic chemistry module on selected student characteristics. The major purpose of the study was to develop an experimental module and then to assess it in terms of its effectiveness, and applicability. The experimental group studied in traditional way. The findings of the study revealed that experimental group gained high in post-tests. Sex and I.Q. were found as not influencing the achievement. Previous achievement was shown as good predictors for achievement in post-test.

Miller (1983) studied on computer oriented application modules for abstract algebra. 26 students formed the sample for the study. The findings of the study revealed that students favourably impressed with the way the modules helped to enrich and motivate their study. The instruction indicated that the modules did not take up much more of time of students.

Hezekiah (1983) developed a teacher's version of a curriculum module for teaching mechanics to teach secondary school physical students. The goals were outlined; characteristics of the topic and approach were also outlined. In the module suggestions were given how to teach, examples, illustrations and many experiments were based on every common experiences. Major findings were:

- The teachers were excited and impressed by the module and expressed willingness to use it.

- The teachers judged that the approach would motivate students and sustain their interest to learn physics, and
- The module was judged by all the evaluators as good.

Sharma (1982) developed instructional material in civics oat 10+2 level for pre-service and in-service teachers. The major findings of the study were:

- 90 percent of students teachers obtained destination marks for modules.
- Majority opined favourably to the different aspect of modules.
- Experimental and control group differ significantly on the test, experimental group being higher, and
- No relationship between sex, age, qualification and teaching experience on modular achievement.

Dyer (1982) developed an art curriculum design using curriculum modules as a means of improving instructions in urban schools. Using instructional modules as a mechanism, this design attempted to provide more scientific guidelines for art instruction. Three self-respondents expressed satisfaction towards the new instruction.

Mason (1982) developed and validated an instructional module to assist the student teachers. Data were collected from 29 teachers from

experimental group who attended a workshop based on the state level competency requirements in West Central Florida. Student teachers knowledge and perception were compared with 24 teachers of the control group who received no treatment. The study revealed that experiment group gained more knowledge than that of the control group. Further proved that this method is helpful in improving attitude towards the handicapped.

Hopper (1982) examined the effectiveness of the three modular approaches on the Biology achievement of X^{th} standard students of three higher secondary schools in Madras.

Smith (1982) developed and validated an instructional module to increase teacher competency in teaching content area reading comprehension skills and found that a low positive correlation in teaching experience and the knowledge of content area. Further the investigator claimed that ‘t’ test for correlated samples revealed a significant difference.

Hopper (1982) conducted an experimental study in the use of modular approach for teaching biology in Standard XI. The aim was to develop six instructional modules on selected units in Biology and structure three modular approaches to find out the effectiveness of the structured modular approaches and modular courses of study on the cognitive achievement of the learners. The main findings of the study were:

- Modular approach of teaching was effective for cognitive achievement.

- All structured modular courses of study were effective with reference to the retentivity of the content and objectives.
- Modular course of study contributed to significant increase in academic motivation of the students.
- Students favoured modular approach involving self learning and peer group learning, and
- Students strongly reported that they had enjoyed modular instruction in biology.

Nirmala (1981) prepared and compared supervised study module with text book approaches in teaching biology in high school and found that supervised study module is more effective than that of traditional method of teaching biology. Further proved that in cognitive level such as, Knowledge, Comprehension, Application and Skill are significant.

Gabriel and Pillai (1981) conducted a study which reports an attempt to modularize learning at college level in India. A difficult unit in Biology was identified and modular learning material was developed, using local resources. The effectiveness of this approach over the traditional teaching approach in terms of learning efficiency, learning time and mastery level is reported. The students who experienced modular scheduling were found to be superior in understanding of concept and retention of concept.

Mukhopadhyay (1981) studied on microteaching vs modular approach. The objectives were:

- To study the development of selected teaching competencies through microteaching and modular approaches, and
- To compare the effectiveness of microteaching and modular approaches in developing selected teaching competencies.

The major findings of the investigation were:

- In questioning, ten from each group satisfied the criterion referenced test, whereas on reinforcement from the microteaching group and seven from modular approach group satisfied the criterion reference test, and
- Both the treatments were equally effective.

Fantaski (1981) designed, developed and validated two audio-visual in-service training modules for boards of school director. A system approach was utilized in the design component. Modules were field tested by 50 school board members of Pennsylvania. The conclusions of the study were:

- Participating school board members demonstrated significant gain sin mean attitudes from pre-to-post-testing, and
- The effectiveness of the modules as a medium for the in-service training of school board members was established.

Sahajahan (1980) developed and measured the effectiveness of modules as an instructional method with that of conventional method in Daca City in Bangladesh. Data were collected through achievement test,

module evaluation check-list and attitude scale. Statistical techniques such as 't' test and chi-square test were used for identifying the significant difference between the groups. The findings showed that modular approach of instructions are found more effective than that of conventional method. Further majority of the students as well as the teachers showed a favourable attitude towards modular approach of instruction.

Main (1980) conducted an experimental study on teaching science in standards VI and VII through modules. The results revealed that in some areas of teaching science in standards VI to VII modules were found to be more effective than the conventional method. Besides modules were much enjoyable to the learners, and they thought that the modules were better to meet their individual need. The study also revealed that the student shave favourable attitude towards modules as a method of instruction.

Vaughan (1977) were conducted experimental study to measure the effectiveness of modules self method and found that there is significant difference in the total score of knowledge of the experimental group over control group.

STUDIES RELATED TO ACADEMIC ACHIEVEMENT

Arora (1992) studied the interaction effect of creativity and intelligence on emotional stability, personality adjustment and academic achievement. The study deals with the relationship between creativity and intelligence and the interaction effect of emotional stability on personality

adjustment and academic achievement. In the study seventy subjects studying in Standard XII were chosen from two boys and two girls intermediate college in Aligarh city by random sampling technique. The results found that there is a positive correlation of interaction effect and intelligence on academic achievement.

Kaur, Parinder (1992) studied the relationship among creativity, intelligence, and academic achievement in different subjects of tenth grade students 300 girls and 300 boys (150 each from rural and urban area). The study revealed that the male and female intelligence was positively related with achievement in all subjects.

Bed, Madhu and Grewal, Hirdai, Pal (1990) studied the relationship between study habits and academic achievement of undergraduate home science final year students. The major findings of the study revealed that home environment of the student and planning of the schedule was significantly related to academic achievement.

Devil, Ulwala (1990) studied the pupil's academic achievement in relationship to their intelligence, neuroticism and locus of control. The sample consisted of 495 students of standard nine selected by random sampling from ten English medium schools in and around Chidambaram. The findings revealed that academic achievement showed a positive and significant correlation with intelligence. Academic achievement has positive correlation with neuroticism.

Mohan, Anand (1988) studied the scholastic achievement as related to self-esteem, feeling of security, depression and text anxiety. The sample contains 300 students of both sex, studied in post graduate college of Jhansi. Major findings indicated that a relationship existed between scholastic achievement and self-esteem. No significant relationship between scholastic achievement and feeling of security.

Ramaswamy, R (1988) made an inquiry into the correlates of achievement. The study aimed at analyzing factors that are responsible for the scholastic performance of class ten students. The study conducted on 72 students of standard ten from 20 schools in Madhura. Major findings of the study found that academic achievement was positively correlated with personality, achievement motivation, self concept, study habit and socio economic status among high and low achieving boys and girls.

STUDIES RELATED TO SOCIO-ECONOMIC STATUS AND INTELLIGENCE

Deary et al. (2007) conducted a study on intelligence and educational achievement. The results of the study were: There is a correlation between a latent intelligence trait (Spearman's "g" from CAT2E) and a latent trait of educational achievement (GCSE scores) was 0.81. General intelligence contributed to success on all 25 subjects. Variance accounted for ranged from 58.6% in Mathematics and 48% in English to 18.1% in Art and Design. Girls showed no advantage in "g", but performed significantly better on all subjects except Physics. This was not due to their better verbal ability. At

age 16, obtaining five or more GCSEs at grades A*-C is an important criterion. 61% of girls and 50% of boys achieved this. For those at the mean level of g at age 11, 58% achieved this; a standard deviation increase or decrease in a g altered the values to 91% and 16% respectively.

Rushton et al. (2007) examined whether the Roma (Gypsy) population of Serbia, like other South Asian population groups, average lower than Europeans on "g", the general factor of intelligence. The results indicate the remarkable cross cultural generalizability of item properties across South Asians, Europeans, and sub-Saharan Africans and those these reflect "g" more than culturally specific ways of thinking.

Shukla (2006) examined the involvement of primary school teachers in developing educational audio learning materials. For this the teachers and students together involved in the activity and felt quite friendly, listening songs or story telling is a classroom are seen helpful in developing and refining listening skills among students.

Selvi (2006) concluded that social values, which are cultivated through social intelligence, make the learner to acquire integrative adjustment of self-control, personal, sound responsibility, democratic social interests and ideals.

Panigrahi (2005) conducted a study on academic achievement and its relation with intelligence and socio-economic status of high school students reveals that intelligence has positive effect of the academic performance on

high school students. It is also found that high intelligence leads to better academic success. The relationship between academic achievement and socio economic status were found not significant.

Riasal Ali (2005) measured the effectiveness of modular teaching in Biology at Secondary level and found that modular approach in teaching is more effective in biology when compared to the traditional method of teaching. Further proved beyond doubt that modular approach in teaching are seen more beneficial to law achievers.

Sunil, Dutt and Divender (2002) examined the effect of self-learning modules on achievement in Economics among senior secondary students and found that teaching through self learning module is helpful to achieve higher scores. Further male students are superior in achievement to that of their counterparts. While considering locale there is no significant difference seen n achievement among the students.

Anilakumari, M.C. (2002) evaluated the physics module prepared for standard XI of Kerala state open school and concluded that the module was inadequate for physics learning.

(1) Coverage of the syllabus in the module was satisfactory.

(2) The physics module prepared was not suitable for self learning

(3) The major aims and functions were not satisfied by the module

(4) The module was appropriate to the age level of the learner.

(5) Mode of presentation of module was not satisfactory.

Bindu (2000) developed a module for in-service training programme for higher secondary teachers for transacting the hard sport areas in biology curriculum and it proved effective.

Reddy and Natarajan (2000) measured the effect of modular approach in learning English of the higher secondary students. The study revealed that the modular approach was more effective than the traditional lecture method in teaching English grammar at +2 level.

Tinglu (1999) prepared and tested a teacher assisted module on preposition in English Grammar for the students of Std IX. The study revealed that modular approach was superior to lecture method for teaching various topics in English in schools.

Thomas (1998) tried to assess the effect of teacher assisted modular approach on achievement in biology of higher secondary students and concluded that the teacher assisted modular approach was more effective than the traditional textbook approach on achievement in biology of higher secondary school students even at knowledge, understanding and application levels.

Mathew (1998) prepared and tested the effectiveness of a large package in zoology for final year degree students on the topic ‘sericulture’ and revealed that the learning package is more effective than textbook in teaching of zoology in colleges.

Lekha (1998) studied the effectiveness of teacher assisted modular approach in teaching mathematics at secondary schools and arrived at the conclusion that it was more effective than traditional method of teaching.

Reddy and Ramar's (1997) developed and tested the effectiveness of multimedia packages for class VIII science subject with special reference to slow learner sand showed that the multimedia instructional strategy was more effective than the traditional lecture method in teaching science and it enabled the slow learner's to cope up with normal students to a considerable extent.

Mathew (1997) conducted a study on the effect of teacher assisted modular approach in teaching physics in secondary schools of Kerala state and concluded that teacher assisted modular approach is more effective than the traditional text book approach on achievement at the knowledge, understanding and application levels.

Roy (1997) prepared and tested the effectiveness of a module on 'sandhi' in Malayalam for degree students and found that modular approach was superior to traditional method of teaching.

Alice Ani (1997) tried to find out the effect of teacher assisted modular approach on achievement in Chemistry and proved that modular approach is more effective than text book method. Further she proved that Modular approach in teaching is helpful in developing skill among children.

Abraham Jolly (1996) in her study found that modular approach was more effective in achievement of chemistry at secondary school students than that of traditional method.

Varghese Ancy (1995) compared the effectiveness of modular approach with traditional text book approach and found that modular approach is more effective than text book approach. Further she compared the effectiveness under the categories of instructional objectives knowledge, comprehension and application and found that at the knowledge level both methods are equally good, but at comprehension and application levels the modular approach is more effective.

Marrett, Renu (1995) made a support study module for learning the occupational aspects of coconut cultivation, at degree level. The following conclusions were being emerged.

- Traditional method of teaching was not suitable in developing the skills of Botany students at B.Sc. level.
- The module prepared was seen effective in providing knowledge in an integrated fashion.

Hazeena (1995) compared modular approach and traditional text book approach in teaching physics. She found that the modular approach is more effective that that of traditional text book approach.

Prakash (1993) conducted an experimental study with a view to find out the effect of guided self study for learning chemistry and found that experimental group performed better than that of control group.

Grag and Chaturvedi (1992) studied the intelligence and socio-economic status as correlates of academic performance. The study was carried out in 535 students, of which 179 from rural areas and rest from urban areas of Bhopal district. The study revealed that there appeared to be linear relationship between intelligence and academic performance which held good both for rural and urban students. Academic performance is related to socio-economic status and also has linear correspondence.

Chand (1992) found in his study that personal values of adolescent boys and girls in relation to socio-economic status and academic achievement; and that there was no significant correlation between socio-economic status and religious, democratic, economic, knowledge power and family prestige values, but there was significant relationship between socio-economic status and social aesthetic and health values.

Harikrishnan (1992) studied the academic achievement of the students of the higher secondary stage in relation to socio economic status. A sample of 300 students were selected at random. The study revealed that girls get higher achievement than boys and socio-economic status was significantly related to achievement.

Devanesan, Paul (1992) conducted a study on socio-economic status, achievement motivation and scholastic achievement of higher secondary students and found that there was a significant relationship between socio economic status and scholastic achievement.

Soona, Ramana (1991) conducted a study on academic achievement of pre-engineering students in relation to their socio-economic status. He found that there was no significant relationship between academic achievement and socio-economic status.

Sumitra (1991) has presented a case study of the audiocassette project of Hoshangabad (M.P.) for teaching Hindi. The salient outlines of the study areas follows: (1) Low cost two in one sets have limited life and they need proper budgetary provisions for running and maintaining them (2) Children when interviewed showed their happiness about the programmes and wanted to listen to more of such programmes (3) The best liked programmes were those, which had segments of songs, stories, questions, and activities.

Mollykutty (1991) measured the effect of modular approach in teacher education and requisites for implementation. It was found out that modular approach is more effective than that of traditional approach. The study suggested to provide more facilities in educational institutions for the effective implementation of modular approach in teaching.

Arunachalam (1991) developed an instructional module for learning history for students of standard X and found that the experimental group scored higher in achievement. As far as the total group is concerned, the use

of instructional module improved the level of learning of history. Further it is seen that instructional module is superior to the traditional approach for the attainment of knowledge, comprehension, application and skills.

Sansanwal and Joshi (1990) conducted an experimental study to measure the impact of specially designed instructional strategy on higher mental abilities of school children. The specially designed instructional strategy consisted of six components namely, programmed learning materials, experimentations, assignment and discussion. The sample consisted of 100, IX standard students and were divided into two groups. Experimental and control groups. The results of the post-test showed that the instructional strategy developed by the investigator was found superior to the traditional approach for developing various abilities such as application, analysis, synthesis, evaluation and overall higher mental ability in science.

Santhosh Kumar (1990) tried to measure the effect of teacher assisted modular approach in teaching physics at secondary school level of Kerala state. The findings showed that the teacher assisted modular approach is more effective than text book approach for student achievement in teaching physics.

Madhumohan (1990) tried to identify the effect of teacher assisted modular approach in teaching chemistry in secondary schools of Kerala. The study revealed that the teacher assisted study module is more effective than text book approach in teaching of Chemistry of high schools.

Madhumohan (1990) conducted a study in Chemistry on the effectiveness of teacher assisted modular approach in teaching secondary school students of Kerala. It was found that the teacher assisted modular approach was more effective than the textbook approach in teaching Chemistry in secondary schools.

Arockiam (1990) developed a self learning package on the skills to ask questions. A group of teachers was trained on the questioning skills through the use of the package. The study showed that teachers improved their questioning skills and the self learning package was found more effective.

Kumar (1990) conducted a study on the effect of teacher assisted modular approach in teaching physics in secondary schools of Kerala state and concluded that the teacher assisted study module was more effective than text book approach in teaching physics at knowledge, understanding and application level.

Usha (1990) conducted a study on preparing and evaluation self instructional film strips on nutrition and found that on the recall test (knowledge) those students got higher score who studied alone with the help of self-instructional filmstrips. On other objectives understanding, application and skill—the gain score was found to be significant for all the three treatments.

Padhan (1990) in his study on creative thinking in relation to socio economic status and scholastic achievement of the higher secondary students of Baroda city found that there was no significant relationship between creative thinking and socio-economic status.

Ganguly, Malabika (1989) found in her study on socio-economic status and scholastic achievement that the mean achievements scores of the SES group of urban areas in all the three groups of subjects differed significantly from those of the lower groups. The upper SES groups had done better in all these and were found to be significant.

Anitha (1989) in her study on preparation of modules for teaching the topic ‘Analysis of Bsic Data in Basic Mathematics for Standard VIII, and found that the modular approach is more effective than traditional method.

Sunsammal (1989) conducted a study on the relationship between creativity, and its components with different tends of intelligence and academic subjects among high school students. She found no significant difference among science and commerce made students in creativity.

Kaile, Harnek Singh (1988) conducted a study on intelligence and creativity as predictors of scholastic achievement in Mother tongue and foreign language at different levels of socio economic status. He found that the measures of intelligence and creativity had more or less identical relationship with scholastic achievement in mother tongue and foreign language for the total sample as well as the three SES groups, ie. high, average, and low.

Devi (1988) examined the test anxiety and intelligence as factors affecting performance on a linear programme and found that the high test anxiety students perform letter on the criterion test than the students belonging to low test anxiety group.

Tivedi, Vineeta (1988) in her study of the relationship of parental attitude, socio-economic background and the feeling of security among the intermediate students and their academic achievement found that there existed a significant relationship among prenatal attitude, socio economic status and academic achievement.

Jayalakshmi (1985) developed and investigated the effectiveness of instructional modules in educational psychology for B.Ed. students. The study revealed that the prepared module was effective in studying educational psychology of B.Ed. students.

Kothari (1985) examined the efficacy of different instructional media in the teaching of Mathematics to the pupils of class IX. The results clearly indicated that the visual projection was comparatively more effective than any other media like activities and experiment or even programmed learning material. The low achievers were comparatively more benefited by programmed learning than the high and average achievers.

Pankiewicz (1984) developed module with a view to assess it in terms of its effectiveness and applicability. The experimental group studied

in traditional way revealed that experimental group gained high in post test scores. Sex and I.Q. were not influencing their achievement.

Miller (1983) studied the effect of computer oriented modular approaches in learning abstract algebra. The sample consists of 26 students and found that students favoured modular approach.

Shah (1981) conducted an investigation on the effect of teaching strategies on the development of creative thinking and achievement in science. The study revealed that there was a significant difference between the four selected strategies in developing creative thinking and achievement in science.

Shylakumari (1980) examined the relationship between intelligence and anxiety on the science achievement. The study reveals that there is no significant relationship between both verbal and intelligence and examination.

Chopra (1970) conducted a study on measured intelligence and academic achievement as related to cultural atmosphere in the house. The study reveals that better educated parents take greater interest in the studies of their children. The cultural atmosphere of the house of the pupils influence their academic achievement.

CONCLUSION

From the reference of empirical studies, the investigator concluded that modular approach in teaching is more effective than that of the existing

method. Further the investigator could gain valuable and systematic information regarding the rules and procedure to be adopted for preparing modules. Moreover, the references of empirical studies enabled the investigator to identify a suitable research design which are presented in the next chapter.

METHODOLOGY

CHAPTER IV

Chapter IV

METHODOLOGY

Methodology of a study is of utmost importance in deciding the validity of its findings. It consists of procedures and techniques for conducting a study. This chapter gives a detailed account of the methods adopted and the procedures followed by the investigator. It includes the research design of the present study, variables and tools of the study and a detailed description of the various phases in the construction of the self-instructional module for the experimental group. It also includes the details of the other tools used in the study namely, less plan for the control group, socio-economic status scale, personal data sheet, intelligence scale and achievement test in Hindi. It also deals with the population, sampling procedure and the matching of two groups for the present study. The details of data collection, administration of the post-test, and the statistical techniques adopted by the investigator are also explained in this chapter.

EXPERIMENTAL RESEARCH DESIGN

In the investigator adopted pre-test and post-test for control group experimental design for the present study. The sample for the study was selected on the random sampling and further equated on the basis of socio-economic status and intelligence.

The steps involved in the pre-test and post-test for control group experimental designs are as follows:

- Randomly assign subjects to the experimental and control groups.
- Administer the pre-test to both groups.
- Treatment to the experimental group but not to the control group, and
- Administer the post test to both groups (Bory and Gall 1969).

The tabular presentation of the experimental research design is shown in Table 4.1.

TABLE 4.1

Experimental Research Design

Groups	Treatment	Post-Test
Experimental Group No.50	Preparation and application of self-instructional modules on selected lesson of the syllabus in Hindi language	Administration of the post test on selected lessons of the syllabus in Hindi language constructed by the investigator
Control Group No.50	Teaching the selected sections of the syllabus in Hindi language through existing method	Administration of the post test on selected lessons of the syllabus in Hindi language constructed by the investigator

VARIABLES OF THE STUDY

The present study involved two types of Variables viz. independent and dependent variables.

Independent variable

The independent variables of the study were:

(i) Instructional material based on modules in Hindi

(ii) Instructional materials based on existing in method (conventional method of teaching)

Dependent Variables

Scores on the achievement test in Hindi language is treated as the dependent variables.

Control variables

The control variables are controlled from the experimental period to get homogenous and equated groups viz. pre-test (i) Intelligence (ii) Socio Economic Status.

Diagrammatical representation of variables used in the study

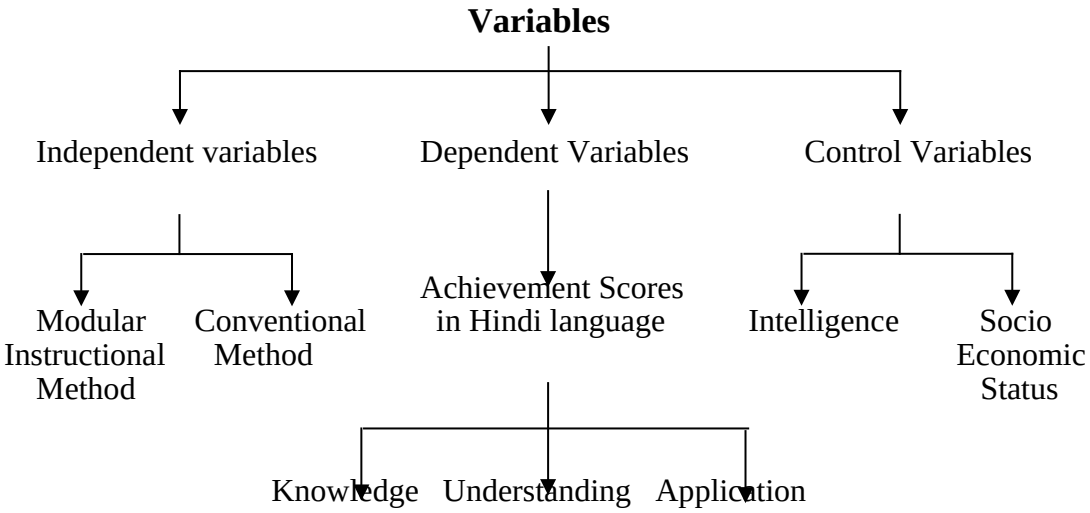


Diagram 1. Variables used in the study

Tools used for the study

The following tools were used in the present study.

- Pretest to measure the level of students
- Lesson Plans on Instructional Module
- Lesson plans (Existing method)
- Achievement Test in Hindi Language (to evaluate the effectiveness of Modular Teaching Method)
- Socio Economic Status Scale (To find out the Socio Economic Status of Experimental/Control Group).
- Personal/Data sheet (to collect personal information of the students)
- Intelligence scale.

A description of each of the tools are given below:

Teaching Module in Hindi (Remani, 2001)

The most important tool for the present study was the self instructional module prepared by the investigator. For the present study, the investigator prepared modules in Hindi for IX standard students. Two prose lessons and one poem were selected including grammatical structures voice, future tense and auxiliary verb were selected for preparing the modules. The lessons selected were:

1. Raja Ram Mohan Roy --- Prose
2. Ekh Patre --- Prose
3. Panchi --- Poem

Preparation and Testing the modules are the two phases. The phases are given below. The self-instructional module prepared by the investigator for the present study was given in Chapter Five.

DESIGN OF THE MODULE

Phase I - Preparation of Modules

To prepare the self instructional module for the experimental group, the investigator analysed the text book of Hindi prescribed by the Government of Kerala thoroughly. Though the analysis the investigator got a first hand information in respect to the objectives, psychological approach adopted in the construction of the text book and the learning experiences provided in the text book. Then she made discussions with the experts including the supervising teacher and teachers who were handling classes in Hindi in the secondary schools. Moreover she referred handbook and source book prepared and supplied by the government to the teachers in this regard.

Based on discussions, the investigator selected the three lessons from the prescribed Hindi Text for Standard IX. The investigator divided each lesson into small units to develop various concepts in learning Hindi such as vocabulary, structures, teaching points (in units), summary, teacher student activities, assignments for home work and unit test. The prepared module consisted of a title, instructions to the students, the objective to be achieved, learning activities, and self evaluation questions are provided at the end of the each unit.

The initial draft of the module was discussed and consulted with the experts, necessary modifications were made and the final form of the module were prepared.

The final draft of the module was prepared by considering the modification suggested by the experts. In the second draft, the preliminary section of the modules were prepared to familiarize the meanings of unfamiliar words and phrases. The teacher tried to explain the meanings of the words without using the text book, by different methods such as question-answer sessions, real life situations, pictures etc. When the teacher did not use the textbook, the students were able to concentrate more on what was communicated in the classroom. A lesson-oriented dictionary was also prepared. Thus it was found that it facilitated better and motivated the learners to acquire the concepts easily and systematically

The lessons were divided into convenient and meaningful units based on the content. The investigator simplified the content and this helped the teacher to convey the content to the students in a better way by using pictures, question-answer session, dialogues, stories etc. The teacher also employed interesting methods such as story telling, conversation, picture presentation and role play. The students were also motivated to prepare their own stories, conversations and captions which are related. Thus the active participation of the students and the teachers were ensured throughout the presentation of the module.

The lessons and prepared modules – two prose, one poem and grammatical structures – are given below in Table 4.2

TABLE 4.2

Conceptual Analysis of the Module

Sl.No.	Lesson	No.of periods
1	Raja Ram Mohan Roy - Prose	6
2	Eak Patru - Prose	5
3	Panchi - Poem	4
	Total	15

Instructional materials for the existing method of teaching

The central group was taught by the investigator using existing method of teaching. For this purpose, the investigator prepared lesson on activity oriented lesson plans and each lesson plans was of forty five minutes duration. The same content was taught to both experimental and control groups.

Phase II: Testing of Modules for Instruction in Hindi language at secondary school level

For testing of modules, experimental method was employed for the present study. In experimental research, the investigator manipulates the independent variables and studies its effect on the dependent variable under controlled conditions (Best and Kahn, 2006).

Rationale for Making Achievement Test in Hindi

In the present study, investigator had to evaluate the effectiveness of Modular Approach over existing method on the basis of instructional objectives. The investigator constructed an objective type Multiple Choice Test to measure the effectiveness of teaching methods in terms of the scholastic achievement in Hindi.

Preparation of the Achievement Test

An achievement test was prepared for measuring the effect of Modular Approach on Achievement in Hindi language. The achievement was calculated by administering an objective type multiple choice achievement test.

The items in the achievement test were prepared keeping in mind the objectives of learning and the content of the topic. The blue print was also prepared. The Achievement Test is given in Appendix I.

The details regarding the weightage to objectives, content, difficulty level, form of questions and details of blue print and scoring key of marking scheme are given below.

Weightage to the Educational objectives

When the test was designed, due consideration was given to the objectives. Viz. Knowledge, Understanding, Application. The weightage to the objectives are given in the table 4.3.

TABLE 4.3

Weightage to Educational Objectives

No.	Educational Objectives	Marks	Percentage
1	Knowledge	10	20
2	Understanding	20	40
3	Application	20	40
	Total	50	100

The investigator opted only objective type items, which has only one response and hence its scoring will be objective. Since Multiple choice items are more objective, efficient and less subject item sampling error, the investigator preferred only multiple choice type items.

Weightage to Content

The investigator consulted with experts, senior teachers in the subject and supervising teacher to prepare the list of content. Due weightage was also given to the important topics in the syllabus of Standard IX. Each content area and the respective weightage given as shown in Table 4.4.

TABLE 4.4

Weightage to Content

No.	Content	Marks	Percentage
1	Content – Prose, Poetry	30	60
2	Linguistic elements – Vocabulary structure and grammar	13	25
3	Composition and Translation	7	15
	Total	50	100

Weightage to difficulty level of questions

The investigator included such items in the achievement test to find the bright, the average and the dull. Weightage given to difficulty level is given below:

TABLE 4.5

Weightage to Educational Objectives

No.	Level of Difficulty	Marks	Percentage
1	Easy	10	20
2	Average	30	60
3	Difficulty	10	20
	Total	50	100

Weightage given to form of Questions

It is an objective type test, so only objective type questions are included.

Blue Print of the Test

The blue print is a three dimensional chart showing the weightage given to the objectives, content and form of questions. Here the investigator opted only the objective type items. Therefore, for the present study, the blue print is a two dimensional chart indicating the content area and the number of questions under each objective. The blue print of the test is given in Table 4.6.

TABLE 4.6

Weightage to Educational Objectives

No.	Content	Knowledge	Under-standing	Application
1	Prose, Poetry	5	13	12
2	Linguistic, vocabulary and structure grammar	4	5	4
3	Composition, translation and essay	1	2	4
	Total	10	20	20

Preparation of Test Items

The investigator at first prepared 70 objective type multiple choice questions in the Achievement Test to find the effectiveness of Modular approach on Achievement in Hindi Language.

The initial draft of the tool was scrutinized by the subject experts and supervising teacher and 10 items were dropped. Only 60 items were remained to the draft test. Necessary instruction for pupils were printed on the test.

Before the actual try out of the text, the draft test was given to a group of 40 pupils in standard IX (20 boys and 20 girls) to find any word difficulty or ambiguity of the items and to determine the time required for completing the test. The defects were rectified on the basis of this test and the investigator finalized the tool for 30 minutes duration.

The draft test along with the instruction was then printed in the form of a question paper. Separate answer sheets were also provided. Each answer

sheet was provided space to write the biographical data of each pupil viz. name of the school, standard with division boys/girls and name of the pupil, etc.

Try Out

For the try out of the Achievement Test in Hindi Language, a stratified random sample of 400 pupils of standard IX from 8 schools of Kannur district of Kerala were selected giving due representation to sex of the pupils, locality and management category of schools. Details of schools are given as Appendix II.

Scoring

As the pupils were provided with separate answer sheets, it was very easy to score the answer sheets using a punched scoring key. All these 400 answer sheets were scored. Score ‘one’ was given to each correct response and ‘zero’ score to a wrong response.

Item Analysis

Item analysis can indicate which items may be too easy or difficult and which may fail to discriminate properly between high and low achievers.

The answer sheet of 370 pupils were scored. On the basis of total score, the answer sheets were arranged in the descending order. The upper 27 percent (ie. 100) response having the highest scores and the bottom 27

percent (ie.100) response having the lowest scores were taken for analysis and were considered as the upper group (U) and the lower group (L) respectively. The middle 170 papers were discarded from analysis. Then the investigator counted the number of right responses for each items in the upper group and lower group.

The difficulty level of each item was calculated by using the formula $\frac{U+L}{N}$ and discriminating power of each item was calculated by using the formula $\frac{U-L}{N}$ (Ebel, 1991).

Where U = Number of correct responses in the Upper group

L = Number of correct responses in the lower group

N = 100

Details of the item analysis are given in Table 4.7

TABLE 4.7

Data and results of item analysis

Item No.	U	L	Difficulty level	Discriminating power	Item No. in the final test	Remarks
1	80	27	0.54	0.53	1	Selected
2	38	14	0.26	0.24	-	
3	50	20	0.35	0.30	-	
4	85	23	0.54	0.62	2	Selected
5	85	24	0.55	0.61	3	Selected
6	60	22	0.41	0.38	-	
7	84	21	0.52	0.63	4	Selected
8	46	20	0.33	0.26	-	
9	78	24	0.51	0.54	5	Selected
10	68	25	0.46	0.43	6	Selected
11	60	22	0.41	0.38	7	Selected
12	79	21	0.50	0.58	8	Selected
13	63	19	0.41	0.44	9	Selected
14	40	30	0.35	0.10	-	
15	75	29	0.52	0.46	10	Selected
16	79	26	0.52	0.53	11	Selected
17	60	40	0.50	0.20	-	
18	81	30	0.55	0.51	12	Selected
19	73	23	0.48	0.50	-	
20	80	29	0.54	0.51	13	Selected
21	76	30	0.53	0.46	14	Selected
22	77	27	0.52	0.50	15	Selected

23	55	35	0.45	0.20	-	
24	47	23	0.34	0.22	-	
25	41	22	0.32	0.19	-	
26	84	45	0.65	0.39	-	
27	70	26	0.48	0.44	16	Selected
28	66	25	0.46	0.41	17	Selected
29	44	18	0.31	0.26	-	
30	50	10	0.30	0.40	-	
31	83	25	0.54	0.58	18	Selected
32	73	23	0.48	0.50	-	
33	60	40	0.50	0.20	-	
34	20	8	0.14	0.12	-	
35	68	25	0.46	0.43	19	Selected
36	82	26	0.54	0.56	20	Selected
37	50	26	0.38	0.24	-	
38	40	30	0.33	0.26	-	
39	60	40	0.50	0.20	-	
40	77	27	0.52	0.50	21	Selected
41	89	13	0.51	0.76	22	Selected
42	70	6	0.38	0.64	-	
43	60	33	0.46	0.27	23	Selected
44	86	32	0.59	0.54	24	Selected
45	81	30	0.55	0.51	25	Selected
46	85	27	0.56	0.58	26	Selected
47	82	34	0.58	0.48	27	Selected

48	92	32	0.57	0.60	28	Selected
49	89	13	0.51	0.76	29	Selected
50	90	28	0.59	0.62	30	Selected

Note: U – Number of right responses in Upper group

N = Number of right responses in Lower group

Preparation of the final test

All the selected items are compiled in the final test. Thus altogether 30 items could include in the final test. The investigator set the limits of difficulty index in between 0.4 and 0.6 and the discriminating power to be greater than 0.4 for the selection of items. These items were then arranged in the order of difficulty index and discriminating power. The investigator fixed the time limit as 30 minutes. The final test and scoring key are given in Appendices III & IV.

The blue print of the final test is given in table 4.8

TABLE 4.8

Blue Print of the Achievement Test in Hindi for the Final Test

No.	Content	Knowledge	Understanding	Application
1	Prose Poetry	3	9	7
2	Linguistic Vocabulary and Structure Grammar	2	3	2
3	Composition and Translation work	1	1	2
	Total	6	13	11

Establishing Reliability

Reliability refers to consistency of test scores that is how much consistent they are from one measurement to another. Reliability of the present test was found by test-retest method. The Achievement test in Hindi (final) was re-administered to the standard IX pupils of a secondary school students after two weeks of the first administration. The reliability of the test was found to be 0.79. This indicates that the Achievement Test in Hindi has high reliability.

Establishing Validity

A test is said to be valid if it measures what it intends to measure. The investigator ensures content validity by giving adequate sampling regarding the content in the existing Hindi syllabus of standard IX of secondary school pupils.

In order to establish the criterion validity of the test, the investigator made use of marks obtained from the annual examination conducted by the schools. The correlation between test scores and the scores obtained in the annual examination was considered as the index of validity. The validity coefficient obtained for the achievement test in Hindi was 0.813 (N=50).

Scoring and Interpretation

The test consists of 30 objective type questions, each carrying one mark. Necessary instructions for the smooth conduct of the test were given at the beginning of the question paper. The maximum marks awarded for the test was 30 and maximum time allotted to the test was 30 minutes. The

scoring key and the marks obtained the experimental and control groups in the Achievement Test were given in Appendix V and VI respectively.

Sample used for the study

A sample is a minute fraction of a population chosen for observation and analysis. By observing the sample, one can easily make certain inference about the characteristics of the population from which it is drawn. In the present study the investigator selected a sample of 100 students of Standard IX secondary school pupils in Kannur district.

Government Higher Secondary School, Mathamangalam, Kannur was selected by the investigator for her study. The co-operation of the authorities and the students provided enough help to the investigator to conduct the present study.

Selection of the Group

100 students were taken for the experimental study, from which 50:50 students were randomly assigned to two groups Experimental and Control and they were matched for Socio Economic Status and Intelligence.

MATCHING OF SAMPLE

The sample selected for the experimental study was randomly assigned to experimental and control groups and were matched on socio economic status and intelligence.

The investigator prepared a personal data sheet to collect the information regarding the occupation, education and monthly income of the family members of the students of Standard IX of Government Higher Secondary School, Mathamangalam, Kannur. A copy of the personal data sheet is attached in Appendix VII.

Socio Economic Status Scale

In order to get the socio economic status score, in the investigator used the Socio-Economic Scale prepared by A.S.Nair in 1978 and revised in 2005. This was done by considering due to salary hike the income limits were modified in consultation with experts.

The Socio Economic Status of a student is measured in terms of three variables namely Education, Occupation and Income. Each variable is classified into 6 categories. The total scores obtained for the three dimensions of Socio Economic Status is considered as the Socio Economic Status Score of the family. The categories and weightages given to items in the SES scale are given in Table 4.9.

TABLE 4.9

Categories and weightages given to each item in the Socio-Economic Status Scale

Sl. No.	Education	Score	Occupation	Score	Income per month (Rs.)	Score
1	Illiterate	1	Unemployed	1	Below 1000	1
2	Standard I to IV	5	Unskilled	5	1000-3000	5
3	Standard V to VII	10	Semi-skilled	10	3000-8000	10
4	Standard VIII to X	15	Skilled	15	8000-13000	15
5	PDC or equivalent	20	Semi professionals	20	13000-20000	20
6	Bachelor's degree	25	Professionals	25	20000-30000	25
7	Masters' degree Professional degree and above	30	High professionals	30	30000 and above	30

The data thus obtained were analysed by computing Mean and Standard Deviation and subjected to the significance of the difference between uncorrelated means (means of experimental and control groups) using a two tailed test. The level of significance is fixed at 0.01 and 0.05 level. The theoretical values are 2.58 and 1.96 respectively. The details are given in Table 4.10.

TABLE 4.10

Test of significance of the difference between means of scores on experimental and control groups at the SES scores

Groups	No.of students	Mean	S D	CR	Level of significance
Experimental	50	32.06	1.54	1.802	Not significant
Control	50	30.42	4.56		

The table 4.10 shows that the critical ratio is not significant even at 0.05 level. This shows that the two groups do not differ significantly with regard to SES Scores. From this it can be concluded that the students of the experimental and control group are almost equal in their SES Scores.

INTELLIGENCE

Raven's Standard Progressive Matrices

J.C. Raven constructed a Progressive Matrices to measure the educative component of 'g' as defined in Spearman's theory of cognitive ability. The test is made up of 5 sets of series, of diagrammatic Puzzles exhibiting serial changes in two dimensions simultaneously. Each puzzle has a part missing, which the person taking the test has to find out from the options provided. The test consists of 60 problems divided into five sets (A, B, C, D, E) each comprised of 12 problems. In each set the first problem is as nearly as possible self-evident. The problems which follow are built on the argument of these that have gone before and become progressively more difficult.

The five sets provide five opportunities to grasp the method of thought required to solve the problems and five progressive assessments of a

person's capacity for intellectual activity. To ensure sustained interest each problem is boldly presented accurately drawn and as far as possible.

The SPM was originally designed to cover to the widest possible range of mental ability and to be equally useful with persons of all ages, whatever be their education, nationality or physical condition.

Illustrations from the sets A, B, C, D & E are given as Appendix VIII.

All subjects are given exactly the same series of problems in the same order and asked to work at their own speed, without interruption, from the beginning to the end of the test. As the order of problem provides the standard training in the method of working, the test can be given as an individual, a self administered, or a group test. A person's total score provides an index of his intellectual capacity.

This test is a standardized one and its validity and reliability have been established. Moderates to high correlation are reported for SPM and various non-verbal and performance test of intelligence. Test retest correlation ranged from 0.55 to 0.84.

The test book let and response sheet each were given to the pupils. The investigator explained to the testees what is to be done. They were asked to write the number of the pattern to be filled in the gap of each puzzle in the space provided in the response sheet (The response sheet is given as Appendix IX(a) and the scoring key is given as Appendix IX(b). The scores

of the intelligence test scores are given as Appendix X. Thus the two groups become homogenous in respect of their intelligence.

From this it can be concluded that the students of the experimental and control group are almost equal in their intelligence.

Questionnaire developed by the investigator for gathering views of teachers and parents are given as Appendix XI.

DATA COLLECTION PROCEDURE

The present study was conducted to measure the effectiveness of modular approach on achievement in Hindi in secondary school level. The procedure adopted in conducting the experimental study has two levels, Treatment level and Post-Test level.

Treatment level

- Learning by the Experimental Group
- Learning by the Control Group

Post Test Level

Post Test Examination

Treatment level

The experimental group was exposed to modular approach of teaching by the investigator. Each topic was taught and each topic took 45 minutes duration. All topics were in the form of a self-study material and

students studied it and did all the activities including it. The lessons were prepared with a view to develop the self-learning ability of the students.

The control group was taught the content using existing method by the investigator herself. Equal time and efforts were given to the control group also.

Administration of the Post Test

After the completion of the teaching to both the groups, an achievement test was administered by the investigator. The test was conducted at the same time. The test was scored with the help of a scoring key. The scores were subjected to statistical analysis also.

STATISTICAL TECHNIQUES USED FOR THE ANALYSIS

The following statistical techniques were used for the present study:

1. Descriptive Statistics
2. Inferential Statistics

Details of which are presented as shown below:

Descriptive Statistics

Measures of Central tendency (Mean, Median, Mode) Measures of Dispersion (Standard Deviation) and Measures of Divergence from normality (Skewness and Kurtosis) are found.

Measures of central tendency describes the chief characteristics of the entire distribution. They tell the point about which scores have a tendency to cluster. First it is, an average, which gives a concise description of the performances of the group as a whole; and it enables to compare two or more groups in terms of typical performance. There are three averages. They are Arithmetic Mean, Median and Mode.

Arithmetic Mean

Arithmetic mean is the most common and typical of the averages. It is used advantageously when the scores are distributed systematically around a central point. It has calculated by the formula:

$$\text{AM } (\overline{X}) = \frac{\sum fx}{N}$$

Where f = frequency
x = scores
N = number of measures

Median

Median is the middle score of the distribution. It is the score situated exactly in the middle when the scores are arranged in the ascending or descending order of their magnitude.

Mode

The score that has maximum frequency in a distribution is said to be the model score or the mode. The mode of the samples was calculated by using the formula.

Mode = 3 Median – 2 Mean

Measures of dispersion

The statistical measures used for determining the nature and extend of dispersion are known as measures of dispersion or measures of variation. In the present study the investigator has calculated standard deviation to determine the nature of the group.

Standard Deviation

Standard deviation is the most widely used measures of dispersion of a series. It is the square root of the variance, and is always calculated from the arithmetic mean. The standard deviation was calculated by the formula:

$$\sigma = i \sqrt{\frac{\sum fd^2}{N} - \left(\frac{\sum fd}{N}\right)}$$

Where:

$\sum fd^2$ = sum of the squares of deviation

$\sum fd$ = sum of deviation

i = size of class interval

N = Total number

Measures of Divergence from Normality

Skewness

An ordinary frequency curve is different from the normal curve. Ordinary curve lacks symmetry and they extend either to right or left. This lack of symmetry due to the extended tails in a particular direction is known skewness. Skewness was calculated by using the formula:

$$\mathbf{Sk = 3}\left(\frac{\mathbf{Mean - median}}{\sigma}\right)$$

Where σ = standard deviation

Kurtosis

Kurtosis is the peakedness or flatness of a frequency curve as compared with the normal curve. The investigator calculated Kurtosis by using the formula:

$$\mathbf{KU} = \frac{\mathbf{P_{75} - P_{25}}}{\mathbf{2\,(P_{90} - P_{10})}}$$

Where

P_{75} = 75th percentile

P_{25} = 25th percentile

P_{90} = 90th percentile

P_{10} = 10th percentile

Inferential statistics

Inferential statistics comprises of test of significance of the difference between the uncorrelated and correlated means of groups matched for mean and standard deviation, using two tailed test. The scores obtained under various instructional objectives (Knowledge, understanding and application) were separately considered and subjected to test of significance of the difference between correlated means of groups matched for mean and standard deviations using two tailed test.

Critical ratio is found out by using the formula:

$$C.R. = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Where

CR = Critical Ratio

M_1 = Mean of first group

M_2 = Mean of the second group

σ_1 = standard deviation of the first group

σ_2 = standard deviation of the second group

N_1 = size of the first sample

N_2 = size of the second sample

The difference between the means is said to be significant depending upon whether the t-value exceeds $\pm$ 1.96 at 0.05 level or $\pm$2.58 at 0.01 level of significance (Best, 1992).

The fifth chapter deals with the self instructional module prepared by the investigator for the treatment of the experimental group.

PREPARATION OF TEACHING MODULES FOR INSTRUCTION IN HINDI

CHAPTER V

Chapter V

PREPARATION OF TEACHING MODULES FOR INSTRUCTION IN HINDI

Introduction

The investigator proposed to consider the IXth standard text book of Hindi prescribed by the Government of Kerala during the year 2002-2003 for analysis with a view to identify the lessons to be included for the present investigation. For this, the investigator first made a detailed discussion with the teachers and resource persons who are actually handling the classes so as to identify the details of the book and other related teaching learning materials. Then the investigator analysed the syllabus, course book, practice book and other source books prescribed for Standard IX. The course book and practice book are meant for pupils and source book for teachers. In this prescribed curriculum as in the case of other language due importance has been seen given for development of communicative abilities as language can be learned through communicative teaching learning process.

The text book of IXth standard Hindi contained seventeen lessons. Out of which nine lessons are prose and three poetry lessons. In addition to this, two lesson for conversation. One lesson for providing proficiency in letter writing are seen included. More over for developing story writing, a lesson is also included. Another lesson is a drama.

A brief description of the lessons included in the text book

First two lessons are intended to develop conversation ability among the students. narrates a conversation between cloth merchant and the customer and the second is a conversation between a doctor and a patient. Through these lessons, the students become more and more capable in interaction with various type of people in their life. More over they may get opportunity to develop communication skill in Hindi.

The third lesson is entitled as (Birbal Ki Kitchadi). In this lesson, the author describes about injustice by describing a story of incidence. Through this lesson students are given an opportunity to think and fight against injustice which has been spreading in our community as a cancer. The fourth lesson Kabir, which describes about the famous poet and social reformer Kabirdas. According to Kabir "Guru" is greater than God as he remove our ignorance and shows the light of wisdom. More over, the lessons given a clear picture about his social revolution against social evils such as casteism untouchability existed in our community. Learning through these lessons students become more capable of moving in the right path.

Through the poem Subhadrakumari Chauhan describes the innocence of childhood and its goodness.

In the sixth lesson Ganathantra Divas is intended to develop right attitude and creates participation among students towards

his country. More over, it gives a clear picture of freedom fights for attaining independence. The eight lesson provides a glimpse on different languages of India and its rich culture and heritage.

The lesson seven is a very sensitive story which describe the love and innocence of children.

(Bhasath Hawa) is a poem, describes the natural beauty and its misuse which adversely affect the climate conditions.

Tenth lesson is drama which helps to develop interactive skills among children. Further, substantiate that virtues an be accepted even from enemies. Through lesson narrates Shivaji's devotion to his country.

Through the lesson Rajastan provides an awareness regarding historical and cultural heritage of Rajasthan.

The twelfth lesson Acharya 'Jagadeesh Chandra Bose' gives certain scientific invention of Bose which help to develop scientific attitude among students.

The thirteenth lesson is A Letter ( ) which helps to develop letter writing skill among students.

is a poem written by Arsiprasad Singh about the important of community living by narrating the lift of different kinds birds who live together. This gives the students an idea to develop 'we' feeling among the students.

Fifteenth lesson is ‘Rajaram Mohan Roy’ a social reformer. Through this lesson, the author depicts the life sketch of Rajaram Mohan Roy and his role to avert social evils such as ‘Sathi’ and casteism. He also encouraged widow-remarriage.

In the sixteenth lesson Delhi provides a detailed description of ‘Delhi’ the capital of India and various important places.

The last lesson is which helps the learner to get a clear picture about various electronic media like television and radio.

CONCLUSION

From the discussion it is seen that the IX standard textbook of Hindi is an all embracing one which provides the pupils an overall idea about the Indian culture and values to be imbibed. Through this they could develop the fourfold skills and the different study habits.

The lessons included in the text book contains various themes including letter writing, biographies, descriptions, stories and poems. The prose lessons are meant to develop the LSRQ skills and various other sub skills which helps the learners to master that particular language. The poems helps to develop the appreciation power among the learners.

In the present study the investigator included the following lessons for modular preparation:

1. Rajaram Mohan Roy
2. A Letter
3. Panchi

These three lessons help the learners to develop the various skills required for the mastery of that language. More over these lessons were being included in the third term.

The modules based on these lessons are given in the following pages.

DEPARTMENT OF ADULT AND CONTINUING EDUCATION AND EXTENSION SERVICES

UNIVERSITY OF CALICUT

Modules prepared based upon the following lessons

1. **Rajaram Mohan Roy**
2. **Ek Patre**
3. **Panchi**

Name of the Investigator : RAMANI V.N.

CONTENT

Name of the Lesson	No.of sub unit	Topic/idea presented
Rajaram Mohan Roy	**6 units**	A brief introduction of the lesson Vocabulary Structures included in the lesson Grammar Teacher-pupil activities Evaluation
Ek Patre	**5 units**	Introduction regarding the format of the letter Vocabulary Structure Grammar Teacher-Pupil Activities Evaluation
Panchi	**4 units**	Introduction Vocabulary Rhyming words Imaginary words Teacher-pupil activities Evaluation

ANALYSIS AND INTERPRETATION OF DATA

CHAPTER VI

Chapter VI

ANALYSIS AND INTERPRETATION OF DATA

The focus of the study is to find out the effectiveness of Modular approach in Hindi language of Secondary School Students. The investigator adopted experimental method. Two equivalent groups consisting of 50 students each were randomly selected for the experimentation and the scores of pupils in both the pre-test and post-test were collected and analysis was done in accordance with the objectives of the study which are mentioned below.

OBJECTIVES OF THE STUDY

1. To prepare instructional module for the selected sections of the syllabus in Hindi language of standard IX of secondary school pupils.

2. To test the effectiveness of Modular Approach on Achievement in Hindi Language among the pupils of standard IX at Secondary School Level.

3. To compare the effectiveness of Modular Approach and existing method on achievement in Hindi language among the pupils of standard IX at secondary school level with special reference to the instructional objectives namely knowledge, understanding and application.

4. To compare the effectiveness of Modular Approach and existing method on Achievement in Hindi language among the secondary school pupils of different intelligence levels – High, Average and Low.

5. To compare the effectiveness of Modular Approach and existing method on Achievement in Hindi language among the secondary school pupils belonging to difference levels of Socio Economic Status, viz. High Average and Below Average.

HYPOTHESES

Based on the objectives the hypotheses formulated for the study were as follows:

1. There will be a significant difference in the mean scores of Achievement Test in Hindi Language of Modern Approach and Existing Method of Teaching among the pupils of Standard IX of the secondary School Level.

2. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX under various categories of instructional objectives namely, knowledge, understanding and application taught by Modular Approach and Existing Method of Teaching.

3. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX of different intelligence level – High, Average and Low.

4. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils belonging to different levels of socio economic status, viz. High, Average and Below Average.

I. PRELIMINARY ANALYSIS OF THE TEST SCORES

The Achievement Scores of Pre-Test and Post-Test were subjected to preliminary statistical analysis to decide the further statistic procedure to be done. The major statistical constants, namely mean, median, mode, standard deviation, skewness and kurtosis were calculated. The distributions were examined for normality.

Student's Achievement in Hindi Language

(a) Before Experiment and (b) After Experiment.

(a) Before Experiment

Before starting the experiment, a pre-test in Hindi language was administered to both the Experimental and Control Groups. The pre-test scores were subjected to preliminary statistical analysis to decide further statistical procedure to be done. The major statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the pre-test scores were calculated. The distributions were separately examined for normality.

Statistical constants of the pre-test scores of both the experimental and control groups were computed and given in Table 6.1.

TABLE 6.1

Statistical Constants of Pre-test Scores in Hindi Language of Both the Experimental and Control Groups

Groups	Variables	N	Mean	Median	Mode	deviationStandard	Skewness	Kurtosis
Experimental	Achievement Test in Hindi (Pre-Test)	50	19.88	18	18	9.39	0.78	-0.337
Control		50	19.23	20	19	6.52	0.83	0.047

The table reveals that, the data distribution of pre-test scores in Hindi language of both the experimental and control groups are almost normal as revealed by mean, median, mode, skewness, kurtosis. Both the experimental and control groups, kurtosis is less than the normal value of 0.263. The distributions are positively skewed. This shows that the number of students who scored low marks were comparatively higher than those who scored high marks in the experimental and control groups.

A post-test was administered to both the experimental and control groups to measure their achievement after the experiment. The scores obtained by pupils were subjected to preliminary statistics such as mean, median, mode, standard deviation, skewness and kurtosis.

The statistical constants of the post-test scores of both the experimental and control groups were computed and shown in table 6.2.

TABLE 6.2

Statistical Constants of Post-Test Scores of Hindi Language of Both the Experimental and Control Groups

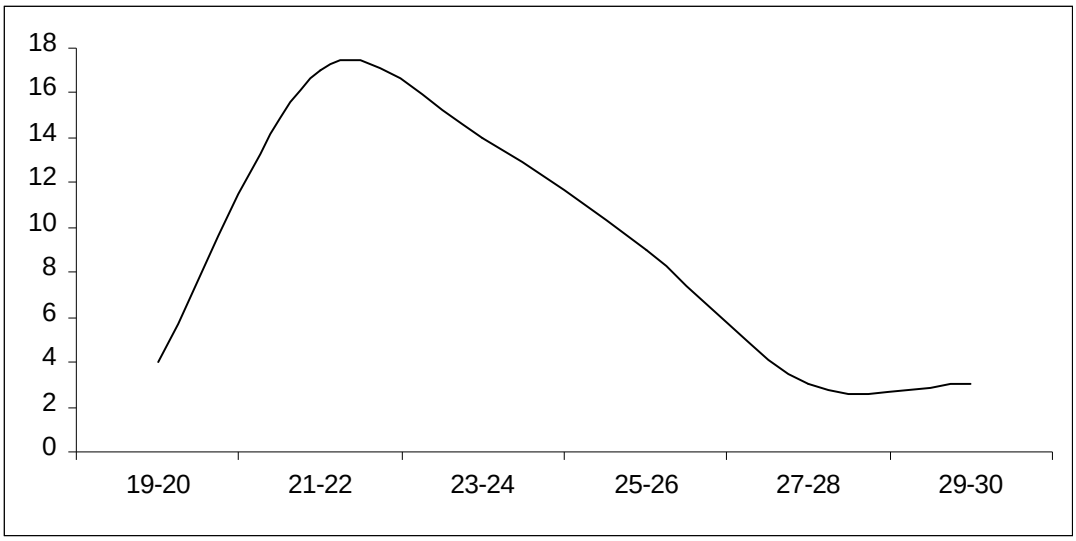
Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	23.48	23	23	2.468	0.614	-0.173
Control	50	17.74	18	18	2.431	-0.003	-0.606

The above results reveal that, the post-test scores in Hindi language of both the experimental and control groups are approximately normal as revealed by mean, median, mode, skewness and kurtosis. Both the groups, kurtosis is less than the normal value of 0.263. The distribution is negatively skewed in control group. That means that the students who scored high marks were comparatively more than those who scored low marks in the groups. But in experimental group, the distribution is positively skewed. That infers that the students who scored low marks were comparatively greater than those who scored high marks.

Normal probability curve of scores achievement in Hindi language is drawn for reaffirm the normality of the above data. Normal probability curve shown as Figure 6.1.

FIGURE 6.1

Smoothed Frequency Curve of Achievement of Hindi Language of Experimental Group

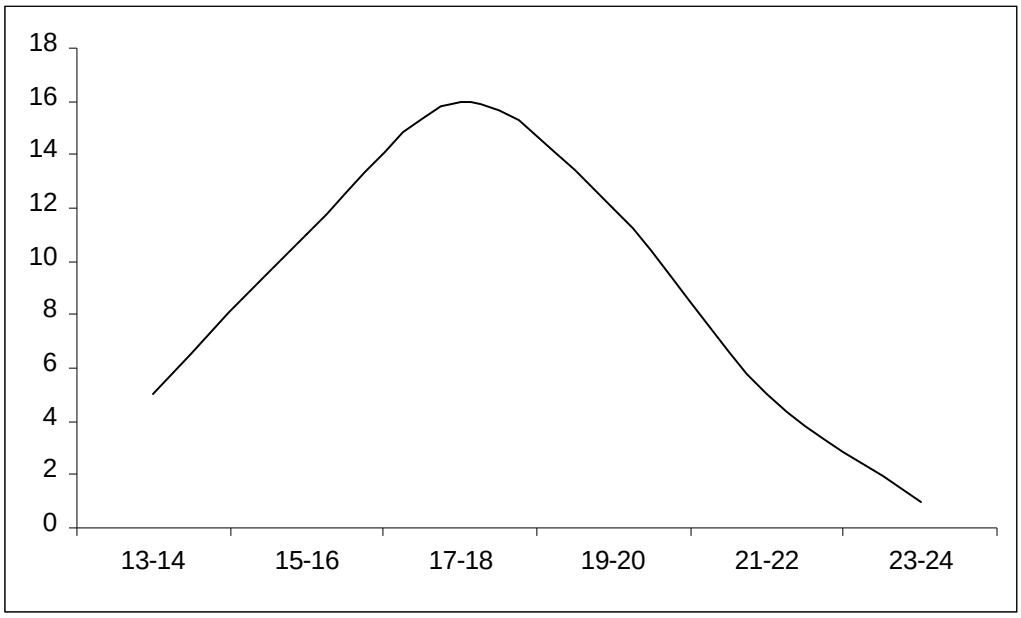


From the figure, it is found that the data of the experimental group follows normality and hence reliable for further analysis.

The table also reveals that the achievement scores of control group are almost normal as revealed by mean, median, mode, skewness and kurtosis. In order to reaffirm the normality of the above, the normal probability curve of the scores of Achievement in Hindi language of control group is drawn and shown as Figure 6.2.

FIGURE 6.2

Smoothed Frequency Curve of Achievement of Hindi Language of Control Group



From the figure, it is found that the data follows normality and hence the data are reliable for further analysis.

II. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE ON ACHIEVEMENT IN HINDI OF SECONDARY SCHOOL PUPILS

(a) Before Experiment

Comparison of means of pre-test scores of Hindi language of experimental and control groups

For the investigation of whether there is any significant difference exists in the mean of pre-test scores of Hindi language of experimental and control group. Mean and standard deviation were calculated separately for the groups. The whole samples were treated as large and independent. The computed Critical Ratios are presented in Table 6.3.

TABLE 6.3

Data and Results of Mean Scores of Pre-test Scores in Hindi Language of Experimental and Control Groups

Group	No. of pupils	Means	Standard Deviation	Critical Ratio
Experimental	50	19.88	9.39	0.97
Control	50	19.23	6.52	

From the table, it was found that the experimental and control groups do not differ significantly at both 0.05 level and 0.01 level in their pre-test scores in Hindi languages.

(b) After Experiment

Comparison of means of post-test scores of Hindi language of pupils in experimental and control groups

The third objective of the study is to test the effectiveness of teaching through Modular Approach and Existing Method. For this, one group was taught using Modular Approach and other using existing method of teaching. The scores are obtained by administering an achievement test immediately after the experiment were subjected to test of significance of the difference between correlated means of groups – Control and Experimental Groups. The level of significance is fixed at 0.01 and 0.05 levels. The theoretical values are 2.58 and 1.96 respectively.

The results of test of significance are given in Table 6.4

TABLE 6.4

Data and Results of Mean Scores of Post-test Scores in Hindi Language of Experimental and Control Groups

Group	No. of	Means	Standard	Critical Ratio

	students		Deviation	
Experimental	50	23.480	2.468	11.716**
Control	50	17.740	2.431	

Note: ** indicates significance at 0.01 level)

Table 6.4 indicates that the critical ratio 11.716 is significant at 0.01 level. Hence the critical ratio 11.716 is greater than the theoretical value 2.58. Therefore there is a significant difference between the means of scores on achievement test in Hindi language among the pupils of standard IX taught by Modular Approach and Exiting Method.

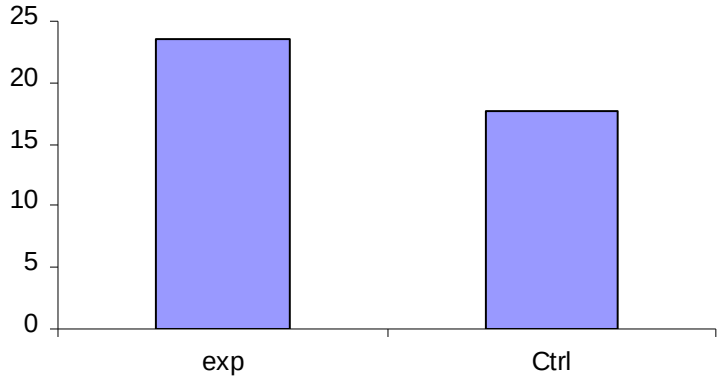
Discussion

It is observed that the means of scores of Achievement Test in Hindi language of Experimental Group is higher than the means of scores of the Control Group. It indicates that the higher mean of Experimental Group is due to the treatment given using modular approach of teaching. The treatment was effective to increase the achievement of the students in Hindi language. It means that, modular approach increase the achievement in Hindi language of pupils of standard Ix of secondary school.

In order to reaffirm the significance of the above, a graphical representation of the comparison of post-test scores of the pupils in the experimental and control groups are drawn and shown as Figure 6.3.

FIGURE 6.3

Comparison of Post-Test Scores in Hindi Language of Experimental and Control groups



III. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE UNDER THE DIFFERENT CATEGORIES OF INSTRUCTIONAL OBJECTIVES

The investigator decided to counter check the effectiveness of modular approach in Hindi language. For this, the investigator compared the means of Achievement test scores of pupils in experimental and control group under the different categories of objectives such as (i) Knowledge, (ii) Understanding (iii) Application.

The details are presented below:

(i) Pupils' Achievement in Hindi Language with respect to 'Knowledge'

a) Before Experiment

The pre-test scores obtained by the pupils in both the groups were analysed and then calculated the mean, median, mode, standard deviation,

skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in table 6.5

TABLE 6.5

Statistical Constants of Pre-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective 'Knowledge'

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	5.28	5	5	1.220	0.756	0.305
Control	50	5.53	5	5	1.280	0.831	-0.572

The above table shows that the pre-test scores in Hindi language with respect to the objective 'knowledge' of both the experimental and control groups are almost normal as revealed by mean, median, mode, skewness and kurtosis. Kurtosis is 0.315 greater than the normal value, 0.263 in experimental group. But in control group, kurtosis is –0.572, which is less than the normal value. Both the groups, the distributions are positively skewed. This means that number of students who scored low marks were comparatively higher than those who scored high marks in the group.

Comparison of the difference between the means of the pre test scores of Hindi language of experimental and control groups, with respect to the objective 'Knowledge' are given in table 6.6.

TABLE 6.6

Data and Results of Mean Scores of Pre-test Scores in Hindi Language of Experimental and Control Groups

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	5.28	1.22	0.24
Control	50	5.53	1.28	

From the table, it is inferred that the experimental and control groups do not differ significantly in their pre-test scores of Hindi language in Knowledge level.

(b) After Experiment

The scores obtained after the treatment, modular approach were subjected to analysis. Mean, median, mode standard deviation, skewness and kurtosis were calculated in order o get a clear picture of the performance of both the groups.

The statistical constants are given in Table 6.7

TABLE 6.7

Statistical Constants of Post-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective ‘Knowledge’

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	6.96	7	7	1.049	0.413	-0.505

Control	50	5.02	5	4	1.220	0.241	-0.955

The distribution of the post-test scores, scores after the treatment of both the experimental and control groups are approximately normal because the mean, median and mode have almost equal values. In the experimental group, the skewness is 0.413 and the kurtosis is 0.241. It inferred that the students who scored low marks were comparatively more in number than those who scored high marks in the group. The values of skewness and kurtosis revealed that the students who scored low marks were comparatively greater than those who scored high marks in control group.

Comparison of Means of Post-Test Scores of Hindi language of pupils in Experimental and control group under the objective 'Knowledge'

The objective is to find out whether there is significant difference in the means of scores of achievement in Hindi language among the pupils of standard IX under the category of the objective Knowledge taught by Modular Approach and Existing Method. The scores with respect to the knowledge level were computed. Mean and Standard Deviation were calculated separately for experimental and the control groups. The whole samples were treated as large and independent.

The computed critical ratio are listed on tabular form in the table 6.8.

TABLE 6.8

Data and Results of Mean Scores of Post-test Scores in Hindi Language of Experimental and Control Groups with respect to the Objective 'Knowledge'

Group	No. of	Means	Standard	Critical Ratio

	students		Deviation	
Experimental	50	6.960	1.049	8.524**
Control	50	5.020	1.220	

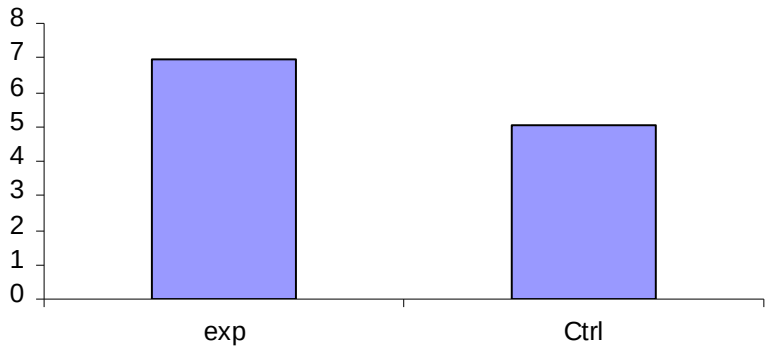
Note: ** significant at 0.01 level.

The critical ratio obtained when the mean scores of Achievement Test in Hindi language of Experimental and Control groups is 8.524. It was found that significant difference exists in the mean scores of Achievement Test in Hindi language of Experimental and control groups at 0.01 level.

The graphical representation of the comparison of Post-test scores of the pupils are drawn and shown as Figure 6.4 for concerning the effectiveness of modular approach in Hindi language under the objective 'Knowledge'.

FIGURE 6.4

Comparison of Post-Test Scores in Hindi Language of Experimental and Control groups Under the Objective 'Knowledge'



Discussion

The above result reveals that the modular approach significantly influenced in the achievement in Hindi language among the pupils of standard IX at the secondary level under the knowledge level. That is, the treatment was more effective to increase the Achievement score in Hindi language under the Knowledge level. It means that, modular approach increase the Achievement in Hindi language of pupils of standard IX of secondary school level.

(ii) Pupil's Achievement in Hindi Language with respect to 'Understanding'

a) Before Experiment
b) After Experiment.

(a) Before Experiment

The pre-test scores obtained by the pupils in both the groups were analysed and than calculated the mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of

both the groups. The statistical constants are calculated and given in Table 6.9

TABLE 6.9

Statistical Constants of Pre-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective 'Understanding'

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	495	5	5	1.65	0.723	0.242
Control	50	5	5	5	1.21	0.797	-0.562

For normal distribution, mean, median and mode should coincide and the value of kurtosis is 0.263. Here, both the groups, mean, median, and mode coincide approximately. Kurtosis is less than the normal value on both the groups and the distribution is positively skewed. This shows that the number of the pupils who scored low marks were comparatively higher than who scored high marks in the group, on both the experimental and control group.

Comparison of the difference between the means of the pre-test scores of Hindi language of experimental and control groups, with respect to the objective 'Understanding' are given in table 6.10

TABLE 6.10

Data and Results of Mean Scores of Pre-test Scores in Hindi Language of Experimental and Control Groups with respect to ‘Understanding’

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	4.95	1.65	0.21
Control	50	5.00	1.21	

From the table, it was found that the experimental and control groups do not differ significantly in their pre-test scores.

b) After Experiment

The scores after the treatment, modular approach, were analysed and mean, median, mode, standard deviation skewness and kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.11.

TABLE 6.11

Statistical Constants of Post-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective 'Understanding'

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	11.62	12	12	1.245	-0.463	0.531
Control	50	9.2	9	9	1.428	-0.848	0.941

The table shows that the distribution of the post test scores of both the experimental and control groups are approximately normal. Both the experimental and control groups are positively skewed. This means that, the pupils who scored high marks were comparatively more in number than those who scored low marks in the group.

Comparison of means of post-test scores of Hindi language of pupils in Experimental and Control Group under the objective, 'Understanding'

For the investigation of whether there is any significant difference exists in the mean scores of achievement in Hindi language of experimental and control groups under the objective understanding. Mean and standard deviation were calculated separately for the experimental and control group. The whole samples were treated as large and independent. The results are given in Table 6.12.

TABLE 6.12

Data and Results of Mean Scores of Post-test Scores in Hindi Language of Experimental and Control Groups with respect to the Objective 'Understanding'

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	11.620	1.276	8.934**
Control	50	9.200	1.429	

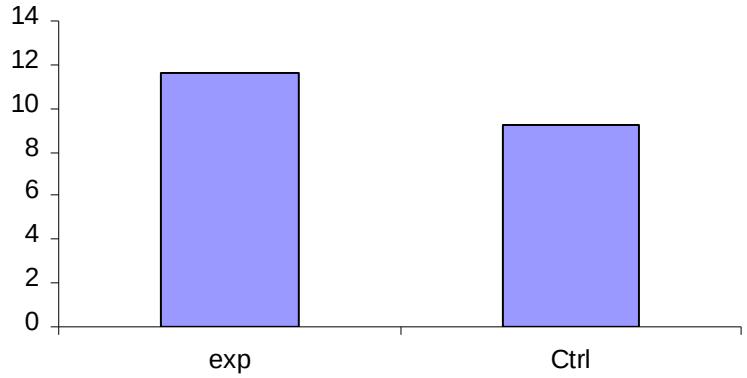
Note: ** significant at 0.01 level.

From the table 6.12 it is observed that the Critical Ratio is 8.934. It indicates that there is high significant difference between the means of scores of achievement in Hindi language among the pupils of standard IX under the category of the objective understanding taught by Modular Approach and Existing Method.

The graphical representation of the comparison of post-test scores of the pupils in the Experimental and Control groups are drawn and shown as Figure 6.5 for strengthening the effectiveness of Modular Approach of Hindi Language with respect to 'Understanding'.

FIGURE 6.5

Comparison of Post-Test Scores in Hindi Language of Experimental and Control groups Under the Objective 'Understanding'



Discussion

It concluded that, the performance of the experimental group is better than the Control Group with respect to Achievement at Understanding level. It is observed that the means of scores of experimental groups is higher than the means of scores of the control group. It indicates that the higher mean of experimental group is due to the treatment given by using modular approach of teaching. So it is concluded that the treatment, Modular Approach is better than the existing method for improving Hindi language among the pupils of standard IX at the secondary school level.

(iii) Pupil's Achievement in Hindi Language with respect to 'Application'

(a) Before Experiment

(b) After Experiment

(a) Before Experiment

The pre-test scores obtained by the pupils both the groups were analysed and then calculated the mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in table 6.13.

TABLE 6.13

Statistical Constants of Pre-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective 'Application'

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	5.28	5	5	1.33	0.456	0.369
Control	50	5.33	5	5	1.22	1.56	-0.523

Mean, median, mode are approximately equal in both the groups, experimental and control group. That means the scores are almost normal in both the cases. Both are positively skewed and the Kurtosis in Experimental group is 0.369 and in control group is -.0.523. This show that, the number of the pupils, in both the groups, who scored low marks were comparatively higher than those who scored high marks in the group.

Comparison of the difference between the scores of pre test scores of Hindi language of experimental and control groups with respect to the objective ‘Application’ are given in Table 6.14

TABLE 6.14

Data and Results of Mean Scores of Pre-test Scores in Hindi Language of Experimental and Control Groups with respect to the Objective ‘Application’

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	2.28	1.28	0.28
Control	50	5.33	1.22	

The table reveals that the experimental and control groups do not differ significantly in their pre-test scores.

(b) After Experiment

The scores after the experiment, teaching in modular approach, were analysed and mean, median, mode, standard deviation, skewness and kurtosis were calculated for getting a clear picture of the performance of both the groups. The statistical constants are given in Table 6.15

TABLE 6.15

Statistical Constants of Post-Test Scores in Hindi language of both the Experimental and Control Group with respect to the Objective 'Application'

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	50	4.9	5	5	0.863	0.396	-0.049
Control	50	3.52	4	4	1.014	-0.483	0.021

The table reveals that the scores of post-test of Hindi Language of both the groups are almost normal in accordance with the mean, median and mode. Skewness of experimental group is 0.396. Therefore it is positively skewed and the kurtosis is –0.049. This means that the pupils who scored low marks were comparatively more in number than those who scored high marks in the groups. The skewness of control group is –0.483. It is negatively skewed but the kurtosis is0.021. It concluded that the pupils who scored high marks were comparatively greater than those who scored low marks.

Comparison of Means of Post-Test Scores of Hindi Language of pupils in Experimental and Control groups under the objective, 'Application'

The objective is to find out whether there is significant difference in the means of scores of achievement in Hindi language among the pupils in experimental and control group of Standard IX under the category of the objective, Application. The scores with respect to the Application level were

computed. Mean and Standard Deviation were calculated separately for the experimental and control groups. The results are given in Table 6.16

TABLE 6.16

Data and Results of Mean Scores of Post-test Scores in Hindi Language of Experimental and Control Groups with respect to the Objective 'Application'

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	4.90	0.863	7.324**
Control	50	3.52	1.015	

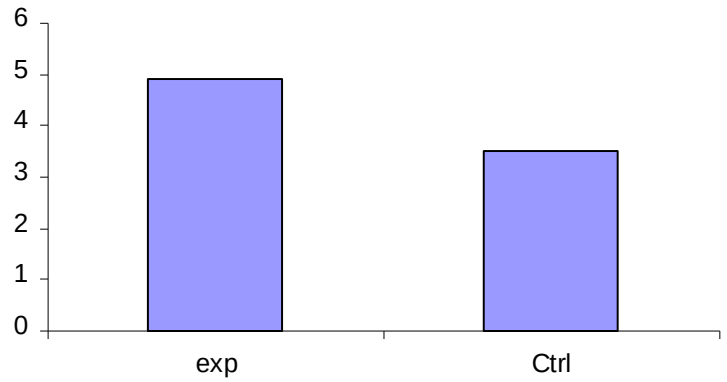
Note: ** significant at 0.01 level.

From the above table, it is revealed that the critical ratio 7.324 is significant at 0.01 level. It was found that high significant difference exists in the mean scores of achievement test in Hindi language of experimental and control groups.

For strengthening the effectiveness of Modular Approach of Hindi Language with respect to the objective 'Application' a graphical representation of the comparison of post-test scores of the pupils of experiment and control groups are drawn and shown as Figure 6.6

FIGURE 6.6

Comparison of Post-Test Scores in Hindi Language of Experimental and Control groups Under the Objective 'Application'



Discussion

It indicates that the modular approach significantly influenced in the Achievement in Hindi language among the pupils of standard IX at the secondary school level under the Application level. That means that, the treatment, Modular Approach was effective to increase the Achievement score in Hindi language under the Application level. That is, modular approach increase the Achievement in Hindi language of pupils of standard IX at Secondary level.

IV. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS OF DIFFERENT INTELLIGENCE LEVEL

The Experimental group and Control group are divided into three sub groups based on their intelligence such as 'High Intelligence Group', 'Average Intelligence Group' and 'Low Intelligence Group'.

The groups were divided into three, based on the Mean and Standard Deviation worked out in term of Intelligence scores. Those falling between

M+1σ and M-1σ are treated as average intelligence group; those falling above M+1σ as high intelligence group and those falling below M-1σ as low intelligence group.

The sub divisions of experimental and control groups are given in table 6.17.

TABLE 6.17

Number of Pupils in Experimental and Control Group based on Intelligence Test

Group	Mean	S.D.	M+1σ	M-1σ	Levels	% of pupils	No. of pupils
Experimental	28.21	4.81	33.02	23.4	High (M+1σ)	17.7	9
					Average (M+1σ to M-1σ)	71.1	35
					Low (M-1σ)	11.2	6
Control	27.37	4.13	31.5	23.24	High (M+1σ)	12.1	6
					Average (M+1σ to M-1σ)	80	40
					Low (M-1σ)	7.9	4

From the table 6.17 it is clear that out of 50 pupils, 9 (17.7%) have high intelligence in experimental group and 6 have high intelligence in control group. 35 (71%) pupils have average intelligence in experimental group and 40 pupils have average intelligence in control group. But only 6 and 4 pupils have low intelligence in experimental and control groups respectively.

The effectiveness of teaching modules in Hindi on achievement in Hindi language of secondary school pupils of different intelligence levels is given below.

(i) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of High Intelligence Group

The summary of different analysis made for the present study is: Pupil's Achievement in Hindi Language.

(a) Before Experiment

(b) After Experiment

(a) Before Experiment

Before starting the experiment an achievement test was administered to the high intelligence group in both the experimental and control groups The pre-test scores obtained by the students in both the groups were condensed into frequency tables and then calculated the arithmetic mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.18.

TABLE 6.18

Statistical Constants of Pre-Test Scores of the Experimental and Control Group of High Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	9	34.57	34	34	1.060	0.730	-0.320
Control	50	34.2	34	34	1.300	0.860	0.045

For normal distribution mean, median and mode should coincide. Here mean, and median coincide approximately. The distribution is positively skewed on both the groups since the value of skewness is 0.73 in Experimental group and 0.045 in Control group. This shows that the number of pupils who scored low marks was comparatively higher than those who scored high marks in both the experimental and control groups.

Comparison of the difference between the means of the pre-test scores of Experimental and Control group of high intelligence are given in Table 6.19.

TABLE 6.19

Comparison of the difference between the means of Pre-test Scores of Experimental and Control Groups of High Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	34.57	1.54	1.76
Control	34.20	1.43	

From the tabled value it is inferred that the Experimental and Control Groups do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were condensed into frequency tables and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistical constants are given in table 6.20

TABLE 6.20

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of High Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	9	40.11	40	40	1.820	0.750	-0.698
Control	6	36.35	36	36	1.350	0.998	-0.256

The frequency distribution of the post-test scores of the experimental group and the control group are approximately normal because the mean, median and mode have almost equal values. The skewness is 0.750 and 0.988 of experimental and control groups. So we can infer that the student who scored low marks were comparatively greater than those who scored high marks in the group on both the group experimental and control.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of High Intelligence are given in Table 6.21.

TABLE 6.21

Comparison of the difference between the means of Post-test Scores of Experimental and Control Groups of High Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	40.11	1.82	13.82**
Control	36.35	1.35	

Note: ** indicates significant at 0.01 level.

From the tabled value it is inferred that the two groups experimental and control groups differ highly significant in their post-test scores.

(ii) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of Average Intelligence Group

The summary of different analysis made for the present study is: Pupil's achievement in Hindi language.

(a) Before Experiment

(b) After Experiment

(a) Before Experiment

Before starting the experiment an achievement test was administered to both the experimental and control groups. Same test was conducted to both the groups. The pre-test scores obtained by the pupils in both the groups were condensed into frequency tables and then calculated the arithmetic mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.22.

TABLE 6.22

Statistical Constants of Pre-Test Scores of the Experimental and Control Group of Average Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	35	27.16	27	27	0.980	0.890	-0.369
Control	40	27.89	27	27	0.990	0.930	0.057

For normal distribution mean, median and mode should coincide. Here mean, and median coincide approximately on both the cases. For a normal distribution the value of kurtosis is 0.263. Here kurtosis is –0.369 and 0.057, which is less than 0.263. The distribution is positively skewed on both the groups. This shows that the number of pupils who scored low marks were comparatively higher than those who scored high marks in the group.

Comparison of the difference between the means of the pre-test scores of Experimental and Control groups of Average intelligence are given in Table 6.23.

TABLE 6.23

Comparison of the difference between the means of Pre-test Scores of Experimental and Control Groups of Average Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	27.6	0.98	0.18
Control	27.89	0.99	

From the tabled value it is revealed that the experimental and control groups do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were subjected to analysis and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistical constants are given in table 6.24.

TABLE 6.24

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of Average Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	35	36.93	36	36	1.960	-0.720	-0.666
Control	40	34.82	34	34	1.820	0.958	-0.487

The frequency distribution of the post-test scores of the experimental and the control group are approximately normal because the mean, median and mode have almost equal values. On both the groups the skewness of experimental group is –0.72. So we can infer that the pupils who scored high marks were comparatively greater than those who scored low marks in the group. But in the control group skewness 0.958. So we can infer that the

pupils who scored low marks were comparatively greater than those who scored high marks.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of High Intelligence are given in Table 6.25.

TABLE 6.25

Comparison of the difference between the means of Post-test Scores of Experimental and Control Groups of Average Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	36.93	1.96	8.75**
Control	34.82	1.82	

Note: ** indicates significant at 0.01 level.

The above table reveals that the two groups experimental and control groups differ significantly in their post-test scores.

(iii) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of Low Intelligence Group

The summary of different analysis made for the present study is: Pupil's achievement in Hindi language.

(a) Before Experiment

(b) After Experiment

(a) Before Experiment

Before starting the experiment an achievement test was administered to both the experimental and control groups. Same test was conducted to both the groups. The pre-test scores obtained by the pupils in both the groups were condensed into frequency tables and then calculated the arithmetic mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.26.

TABLE 6.26

Statistical Constants of Pre-Test Scores of the Experimental and Control Group of Low Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	6	24.6	24	24	1.10	0.680	-0.388
Control	4	25.3	25	25	1.21	0.830	0.048

For normal distribution mean, median and mode should coincide and the skewness 0.282. Here mean, and median coincide approximately on both the groups. Since Kurtosis is –0.388 in Experimental group and 0.048 in control group which is less than the normal value of 0.263. The distribution is positively skewed on both the experimental and control groups since the value of skewness is 0.68 and 0.880 in experimental and control group. This shows that the number of pupils who scored low marks were comparatively

higher than those who scored high marks in both the experimental and control group.

Comparison of the difference between the means of the pre-test scores of Experimental and Control groups of Low Intelligence are given in Table 6.27.

TABLE 6.27

Comparison of the difference between the means of Pre-test Scores of Experimental and Control Groups of Low Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	24.6	1.1	1.86
Control	25.3	1.21	

The table shows that the experimental and control groups do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were condensed into frequency tables and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistics calculated along with their values are given in table 6.28.

TABLE 6.28

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of low Intelligence

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	6	29.3	29	29	2.100	0.550	-0.789
Control	4	27.1	27	27	1.96	0.569	-0.487

The frequency distribution of the post-test scores of the experimental and the control group are approximately normal because the mean, median and mode have almost equal values. The distribution is positively skewed on both the groups. This means that the pupils who scored low marks were comparatively more in number than those who scored high marks in the group.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of low Intelligence are given in Table 6.29.

TABLE 6.29

Comparison of the difference between the means of Post-test Scores of Experimental and Control Groups of low Intelligence

Group	Means	Standard Deviation	Critical Ratio
Experimental	29.3	2.1	3.57**
Control	27.1	1.96	

Note: ** indicates significant at 0.01 level.

From the table it was found that the two groups experimental and control groups differ significantly in their post-test scores.

Discussion

1. There is a high significant difference at 0.01 level exists between the Experimental and Control groups of High Intelligence in their Post-Test Score (Achievement in Hindi Language). But there is no significant difference exists in their Pre-Test Scores.

2. There exists high significant difference, at 0.01 level, between the Experimental and Control groups of Average Intelligence in their Post-Test Score (Achievement in Hindi Language). There is no significant difference exists in their Pre-Test Scores.

3. There is a significant difference, at 0.01 level, between the Experimental and Control groups of Below Average Intelligence in their Post-Test Score (Achievement in Hindi Language). There is no significant difference exists in their Pre-Test Scores.

V. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS BELONGING TO DIFFERENT LEVELS OF SOCIO-ECONOMIC STATUS

The experimental and control group is divided into three sub groups based on their socio economic status such as ‘High Socio Economic Status Group,’ ‘Average Socio Economic Status Group’, ‘Below Average Socio Economic Status Group.

In the following table, the sub divisions of Experimental and Control Group are given in Table 6.30.

TABLE 6.30

Number of Pupils in Experimental and Control Groups based on Socio-Economic Status

Group	Mean	S.D.	M+1σ	M-1σ	Levels	% of pupils	No. of pupils
Experimental	15.2	2.81	18.01	12.39	High (M+1σ)	11.2	5
					Average (M+1σ to M-1σ)	71.1	36
					Below Average (M-1σ)	17.7	3
Control	14.99	1.99	16.98	13.00	High (M+1σ)	6.0	3
					Average (M+1σ to M-1σ)	78.9	39
					Below Average (M-1σ)	15.1	8

From the table revealed that out of 50 pupils, 5 (11.2%) have high, 36 (71.1%) pupils have Average and only 9 (17.7%) pupils have below average Socio Economic Status in the experimental group. But 3 (6%) have high, 39 (78.9%) pupils have average and only 8(15.1%) pupils have below average Socio Economic Status in the control group.

(i) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of High Socio Economic Status

The summary of different analysis for the present study is: Pupils Achievement in Hindi Language:

a) Before Experiment

b) After Experiment

a) Before Experiment

The pre-test scores obtained by the students in both the groups were subjected to analysis and then calculated the mean, median, mode, standard deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistics calculated and their values are given in Table 6.31.

TABLE 6.31

Statistical Constants of Pre-Test Scores of the Experimental and Control Groups of High Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	5	32.2	32	32	1.18	0.780	-0.346
Control	3	31.3	31	31	1.47	0.880	0.0489

For normal distribution mean, median and mode should coincide and the skewness 0.282. Both the groups, mean, and median coincide approximately. The distribution is positively skewed on both the experimental and control groups since the value of skewness is 0.780 and 0.880. This shows that the number of pupils who scored low marks were comparatively higher than those who scored high marks in both the experimental and control group.

Comparison of the difference between the means of the pre-test scores of Experimental and Control groups of High Socio Economic Status given in Table 6.32

TABLE 6.32

Comparison of the difference between the means of Pre-test Scores of Experimental and Control Groups of High Socio Economic Status

Group	Means	Standard Deviation	Critical Ratio
Experimental	32.2	1.18	0.034
Control	31.3	1.47	

From the table, it is inferred that the experimental and control groups do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were condensed into frequency tables and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistics calculated along with their values are given in table 6.33

TABLE 6.33

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of High Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	5	38.9	38	38	2.3	-0.88	-0.798
Control	3	35.8	35	35	1.9	0.965	-0.398

The table reveals that the post-test scores of the experimental and the control group are approximately normal because the mean, median and mode have almost equal values. The skewness is –0.88. So we can infer that the pupil who scored high marks were comparatively more in number than those who scored low marks in the group. But in control group, the skewness is 0.965. This means that the pupil who scored low marks were comparatively greater than those who scored high marks.

Comparison of the difference between the means of post-test scores of Experimental and Cotrol Group of High SES are given in the table 6.34.

TABLE 6.34

Comparison of the difference between the means of Post-test Scores of Experimental and Control Groups of High Socio Economic Status

Group	Means	Standard Deviation	Critical Ratio
Experimental	38.9	2.3	4.6**
Control	35.8	1.9	

Note: ** indicates significant at 0.01 level

From the table it is inferred that the two groups experimental and control differ significantly in their post-test scores.

(ii) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of Average Socio Economic Status

The summary of different analysis made for the present study is: Pupils' achievement in Hindi language.

(a) Before Experiment

(b) After Experiment.

a) Before Experiment

Before starting the experiment an achievement test was administered to both the experimental and control groups. The same test was conducted to both the groups. The pre-test scores obtained by the students in both the groups were condensed into frequency tables and then calculated the arithmetic mean, median, mode, standard deviation, quartile deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.35

TABLE 6.35

Statistical Constants of Pre-Test Scores of the Experimental and Control Groups of Average Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	36	33.6	33	33	2.600	0.690	-0.480
Control	39	33.7	33	33	2.300	0.990	0.067

For normal distribution, mean, median and mode should coincide. Both the groups, mean, and median coincide approximately. For a normal distribution the value of kurtosis is 0.263. Here kurtosis is –0.489 and 0.067 which is less than 0.263. The distribution is positively skewed in both the experimental and control groups. This shows that the number of pupils who scored low marks were comparatively higher than those who scored high marks in both the experimental and control groups.

Comparison of the difference between the means of the pre-test scores of Experimental and Control groups of Average Socio Economic Status given in Table 6.36.

TABLE 6.36

Comparison of the difference between the means of Pre-test Scores of Experimental and Control Groups of Average Socio Economic Status

Group	Means	Standard Deviation	Critical Ratio

Experimental	33.6	2.6	0.28
Control	33.7	2.3	

From the table, it was found that the experimental and control groups do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were condensed into frequency tables and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistics calculated along with their values are given in table 6.37.

TABLE 6.37

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of Average Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	36	39.6	39	39	3.100	-0.730	-0.669
Control	39	36.1	36	36	2.900	-0.898	-0.569

The frequency distribution of the post-test scores of the experimental and the control group are approximately normal because the mean, median and mode have almost equal values. The skewness is –0.73. That means that the pupils who scored high marks were comparatively more in number than those who scored low marks in experimental group. But the skewness of

control group is 0.898. That means the pupils who scored low marks were comparatively greater than those who scored high marks.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of Average Socio Economic Status are given in Table 6.38.

TABLE 6.38

Comparison of the difference between the means of Post-test Scores of Experimental and Control Groups of Average Socio Economic Status

Group	Mean	Standard Deviation	Critical Ratio
Experimental	39.6	3.1	3.21**
Control	36.1	2.9	

Note: ** indicates significant at 0.01 level.

From the table it was found that the two groups experimental and control groups differ significantly in their post-test scores.

(iii) Comparison of means of Pre-Test Scores of Hindi Language of Pupils in Experimental and Control Groups of Below Average Socio Economic Status

The summary of different analysis made for the present study is: Pupils' achievement in Hindi language.

(a) Before Experiment

(b) After Experiment.

a) Before Experiment

Before starting the experiment an achievement test was administered to both the experimental and control groups. The same test was conducted to

both the groups. The pre-test scores obtained by the pupils in both the groups were condensed into frequency tables and then calculated the arithmetic mean, median, mode, standard deviation, quartile deviation, skewness and kurtosis in order to get a clear picture of the performance of both the groups. The statistical constants are given in Table 6.39.

TABLE 6.39

Statistical Constants of Pre-Test Scores of the Experimental and Control Groups of Below Average Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	9	34.6	34	34	2.6	0.890	-0.399
Control	8	35.3	35	35	2.1	0.980	0.056

For normal distribution mean, median and mode should coincide and the skewness 0.282. Here mean and median coincide approximately on both the groups. The distribution is positively skewed in both the experimental and control groups since the value of skewness is 0.89 and 0.98. This shows that the number of pupils who scored low marks were comparatively higher than those who scored high marks in both the experimental and control groups.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of Below Average Socio Economic Status are given in Table 6.40.

TABLE 6.40

Comparison of the difference between the means of Pre-Test Scores of Experimental and Control Groups of Below Average Socio Economic Status

Group	Means	Standard Deviation	Critical Ratio
Experimental	34.6	2.6	0.89
Control	35.3	2.1	

The table reveals that the experimental and control groups differ do not differ significantly in their pre-test scores.

b) After Experiment

A post-test was administered to both the experimental and control group to measure their achievement after experiment. The scores obtained by pupils were condensed into frequency tables and arithmetic mean, median, mode, standard deviation, skewness, kurtosis were calculated in order to get a clear picture of the performance of both the groups. The statistics calculated along with their values are given in table 6.41.

TABLE 6.41

Statistical Constants of Post-Test Scores of the Experimental and Control Groups of Below Average Socio Economic Status

Groups	N	Mean	Median	Mode	Standard deviation	Skewness	Kurtosis
Experimental	9	40.1	40	40	2.2	0.560	-0.798
Control	8	38.2	38	38	1.6	-0.536	-0.398

The frequency distribution of the post-test scores of the experimental group is approximately normal on experimental and control groups because

the mean, median and mode have almost equal values. The skewness is –0.798. So we can infer that the pupil who scored high marks were comparatively more in number than those who scored low marks in group. But in the control group, skewness is 0.536. That means that the pupils who scored low marks were comparatively greater than those who scored high marks in the group.

Comparison of the difference between the means of post-test scores of Experimental and Control Group of Below Average Socio Economic Status are given in Table 6.42.

TABLE 6.42

Comparison of the difference between the means of Post-Test Scores of Experimental and Control Groups of Below Average Socio Economic Status

Group	Mean	Standard Deviation	Critical Ratio
Experimental	40.1	2.2	4.25**
Control	38.2	1.6	

Note: ** indicates significant at 0.01 level.

From the table, it was found that the two groups experimental and control groups differ significantly in their post-test scores.

Discussion

The above analysis implies that:

1. There exists significant difference at 0.01 level between the Experimental and Control group of High Socio-Economic Status in their Post-Test Scores

(Achievement in Hindi Language). But there is no significant difference exists in their pre-test scores.

2. There is a significant difference exists at 0.01 level between the experimental and control groups of average Socio-Economic Status in their post-test scores (Achievement in Hindi Language). But they do not differ significantly in their pre-test scores.

3. There exists significant difference at 0.01 level between the experimental and control group of Below Average Socio Economic Status in their Post-Tst Scores (Achievement in Hindi Language). But there is no significant difference exists in their pre-test scores.

MAJOR FINDINGS

The above analysis implies that:

1. The analysis of the post-test scores revealed that there exists significant difference at 0.01 level in the mean scores of achievement in Hindi language of Modular Approach and Existing method of teaching among the pupils of Standard IX at the secondary school level. It means that the performance of experimental group is better position with respect to achievement in Hindi language than control group. It means that modular approach is more effective in Hindi language among the pupils of standard IX at secondary school level.

2. The analysis of the post-test scores at the knowledge level revealed that there is a significant difference at 0.01 levels in the mean scores of

achievement in Hindi language of Modular approach and Existing method of teaching among the standard IX at the secondary school level. It means that the performance of experimental group is more than the performance of the control group under knowledge level. That is, the treatment, modular approach is more effective in Hindi language than the existing method of teaching at knowledge level.

3. The analysis of the achievement test scores at the understanding level revealed that there exists a high significant difference at 0.01 level in the mean scores of modular approach and existing method of teaching among the standard IX at the secondary level. It revealed that the performance of the experimental, group is higher than the performance control group at understanding level. It concluded that modular approach is more effective in Hindi language than the existing method of teaching at Understanding level.

4. The analysis of the post test scores at the application level revealed that there exists a significant difference at 0.01 level. It indicated that experimental group is an advantageous position with respect to achievement in Hindi language. That means, modular approach is more effective than existing method in Hindi language at Application level.

5. The analysis of the Post-Test Scores at various levels of Intelligence such as High, Average and Low revealed that there exists a significant difference at 0.01 level. It revealed that the Experimental group of

various levels of Intelligence is higher performance than Control group of various levels of Intelligence – High, Average, Low.

6. The analysis of the Post-Test Scores at various levels of Socio Economic Status such as High, Average and Below Average indicated that Modular Approach is more effective that in the existing method of teaching at various levels of Socio Economic Status – High, Average, Below Average.

From the above, it concluded that the treatment Modular Approach is more effective than the Existing Method to improve the achievement in total, various categories of objectives such as Knowledge, Understanding and Application in Hindi Language, various levels of Intelligence High, Average and Low and various levels of Socio Economic Status such as High, Average and Below Average among pupils at Secondary School level.

SUMMARY, CONCLUSION AND SUGGESTIONS

CHAPTER VII

CHAPTER VII

SUMMARY, CONCLUSION AND SUGGESTIONS

This chapter briefly describes the procedures for the study, conclusions based on findings in brief together with suggestions for improving educational practices and suggestions for further research.

RESTATEMENT OF THE STUDY

The present study was intended to preparation and testing of modules for instruction in Hindi language at secondary school level. To examine the effect of modular approach on achievement in Hindi language among the pupils of standard IX at the secondary school in Kannur district.

OBJECTIVES OF THE STUDY

The objectives formulated for the study are:

1. To prepare instructional module for the selected sections of the syllabus in Hindi language of standard IX of secondary school pupils.

2. To test the effectiveness of Modular Approach on Achievement in Hindi Language among the pupils of standard IX at Secondary School Level.

3. To compare the effectiveness of Modular Approach and existing method on achievement in Hindi language among the pupils of standard IX at secondary school level with special reference to the

instructional objectives namely knowledge, understanding and application.

4. To compare the effectiveness of Modular Approach and existing method on Achievement in Hindi language among the secondary school pupils of different intelligence levels – High, Average and Low.

5. To compare the effectiveness of Modular Approach and existing method on Achievement in Hindi language among the secondary school pupils belonging to difference levels of Socio Economic Status, viz. High Average and Below Average.

HYPOTHESES

The hypotheses framed and tested for the study are:

1. There will be a significant difference in the mean scores of Achievement Test in Hindi Language of Modern Approach and Existing Method of Teaching among the pupils of Standard IX of the secondary School Level.

2. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX under various categories of instructional objectives namely, knowledge, understanding and application taught by Modular Approach and Existing Method of Teaching.

3. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX of different intelligence level – High, Average and Low.

4. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils belonging to different levels of socio economic status, viz. High, Average and Below Average.

METHODOLOGY

The Experimental method of research was adopted for the study. The design selected for the present study was pre-test, post-test only control group experimental design.

The methodology of the present study was described under the following heads, tools, sample and statistical techniques used.

Tools Used

The main objectives of the present study was to find the effectiveness of modular approach on achievement in Hindi language at secondary school level. For this study the investigator used the following tools:

- Instructional Module
- Lesson Plans on Existing Method
- Achievement Test in Hindi Language

- Socio-Economic Status Scale
- Personal Data Sheet
- Intelligence Scale

Sample

The present study was conducted on IX standard Govt. Higher Secondary School, Mathamangalam, Kannur. Total sample selected is 100. Fifty pupils were randomly selected as experimental group and fifty pupils as control group and they were matched for SES, Previous Academic Achievement and Intelligence.

Statistical Techniques Used

In this study, it is not practical to set up groups in which subjects have been matched person to person. So the investigator used the statistical techniques of matching of persons in terms of mean and standard deviation (Garrett, 1981) for comparing effectiveness of modular approach and existing method of teaching in Hindi language. The statistical techniques uncorrelated means using a two-tailed test was employed to test whether there is significant difference exists in mean scores of socio-economic status, Intelligence and Previous Academic Achievement. These scores subjected to a test of significance of the difference between the correlated means of groups matched for mean and standard deviation using a two-tailed test.

IMPORTANT FINDINGS

I. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS

Pupils Achievement in Hindi Language

(a) Before Experiment

Results of comparison of means of pre-test scores of Hindi Language of Experimental and Control groups are given below:

Group	No. of pupils	Means	Standard Deviation	Critical Ratio
Experimental	50	19.88	9.39	0.97
Control	50	19.23	6.52	

(b) After Experiment

Results of comparison of means of post-test scores of Hindi Language of Experimental and Control groups are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	23.480	2.468	11.716**
Control	50	17.740	2.431	

Note: ** indicates significance at 0.01 level.

The above results reveals that the treatment, modular approach was effective to increase Achievement of the pupils in Hindi language of pupils of standard IX at secondary school level.

II. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS WITH RESPECT TO THE OBJECTIVES

(i) Pupils achievement in Hindi language with respect to the Objective 'Knowledge

(a) Before Experiment

Results of comparison of means of pre-test scores in Hindi Language of Experimental and Control groups with respect to the objective ‘Knowledge’ are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	5.28	1.22	0.24
Control	50	5.53	1.28	

(b) After Experiment

Results of comparison of means of post-test scores in Hindi Language of Experimental and Control groups with respect to the objective ‘Knowledge’ are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	6.960	1.049	8.524**
Control	50	5.020	1.220	

The above results indicate that the treatment, modular approach was more effective to increase the achievement scores in Hindi language under the ‘Knowledge’ level among the pupils of standard IX at secondary school level.

(ii) Pupils achievement in Hindi language with respect to the objective 'Understanding'

(a) Before Experiment

Results of comparison of means of pre-test scores in Hindi Language of Experimental and Control groups with respect to the objective 'Understanding' are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	4.95	1.65	0.21
Control	50	5.00	1.21	

(a) After Experiment

Results of comparison of means of post-test scores in Hindi Language of Experimental and Control groups with respect to the objective 'Understanding' are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	11.620	1.276	8.934**
Control	50	9.200	1.429	

From the tables, it is concluded that the treatment, modular approach is better than the existing method for improving Hindi language among the pupils of standard IX at secondary school level.

(iii) Pupils Achievement in Hindi language with respect to the objective 'Application'

(a) Before Experiment

Results of comparison of means of pre-test scores in Hindi Language of Experimental and Control groups with respect to the objective 'Application' are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	2.28	1.28	0.28
Control	50	5.33	1.22	

b) After Experiment

Results of comparison of means of post-test scores in Hindi Language of Experimental and Control groups with respect to the objective 'Application' are given below:

Group	No. of students	Means	Standard Deviation	Critical Ratio
Experimental	50	4.90	0.863	7.324**
Control	50	3.52	1.015	

The above tables reveal that the modular approach increase the achievement in Hindi language of pupils of standard IX at secondary school level.

III. THE EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS OF DIFFERENT INTELLIGENCE LEVEL

(i) High Intelligence Group

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils in 'High Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	34.57	1.54	1.76
Control	34.20	1.43	

(b) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils in 'High Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	40.11	1.82	13.82**
Control	36.35	1.35	

(ii) Average Intelligence Group

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils in 'Average Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	27.6	0.98	0.18
Control	27.89	0.99	

(a) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils in 'Average Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	36.93	1.96	8.75**
Control	34.82	1.82	

(iii) Low Intelligence Group

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils in 'Low Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	24.6	1.1	1.86
Control	25.3	1.21	

(b) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils in 'Low Intelligence Group' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	29.3	2.1	3.57**
Control	27.1	1.96	

From the above results, there is a high significant difference exists at 0.10 level between the experimental and control groups of High Intelligence, Average Intelligence, and Low Intelligence in their post test scores (Achievement Scores). But there is significant difference exists in their pre-test scores. It means that the treatments modular approach increase the achievement in Hindi language of secondary school pupils of different intelligence levels, such as High, Average and Low.

IV. EFFECTIVENESS OF TEACHING MODULES IN HINDI LANGUAGE OF SECONDARY SCHOOL PUPILS BELONGING TO DIFFERENT LEVELS OF SOCIO ECONOMIC STATUS

(i) High Socio Economic Status Group

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils belonging to ‘High Socio Economic Status’ are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	32.2	1.18	0.034
Control	31.3	1.47	

(b) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils belonging to ‘High Socio Economic Status’ are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	38.9	2.3	4.6**
Control	35.8	1.9	

(ii) Average Socio Economic Status group

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils belonging to ‘Average Socio Economic Status’ are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	33.6	2.6	0.28
Control	33.7	2.3	

(b) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils belonging to ‘Average Socio Economic Status’ are given below:

Group	Mean	Standard Deviation	Critical Ratio

Experimental	39.6	3.1	3.21**
Control	36.1	2.9	

(iii) Below Average Socio Economic Status

(a) Before Experiment

Results of comparison of mean scores of pre-test in Hindi Language of pupils belonging to 'Below Average Socio Economic Status' are given below:

Group	Means	Standard Deviation	Critical Ratio
Experimental	34.6	2.6	0.89
Control	35.3	2.1	

(b) After Experiment

Results of comparison of mean scores of post-test in Hindi Language of pupils belonging to 'Below Average Socio Economic Status' are given below:

Group	Mean	Standard Deviation	Critical Ratio
Experimental	40.1	2.2	4.25**
Control	38.2	1.6	

The above results concluded that there exists a significant difference at 0.01 level between the experimental and control groups of High Socio Economic Status, Average Socio Economic Status and Low Socio Economic

Status in their Achievement Scores (post-test scores). But there is no significant difference exists in their pre-test scores. It means that modular approach is effective to increase the achievement in Hindi language among Standard IX of secondary school pupils belonging to different levels of SES.

TENABILITY OF HYPOTHESES

Based on the findings, the tenability of the hypotheses set for the study were examined.

The first hypothesis that

1. There will be a significant difference in the mean scores of Achievement Test in Hindi Language of Modern Approach and Existing Method of Teaching among the pupils of Standard IX of the secondary School Level.

   Hypothesis 1 is significant at 0.01 level for the experimental and control group of secondary school pupils. The results of the study reveals that there is significant difference exists in the mean scores of achievement test in Hindi language of modular approach and existing method of teaching among the pupils of standard IX of the secondary school level.

2. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX under various categories of instructional objectives namely, knowledge,

understanding and application taught by Modular Approach and Existing Method of Teaching.

The second hypothesis is significant for the experimental and control group of secondary school pupils. The results of the study reveals that there is significant difference exists in the mean scores of achievement in Hindi Language of secondary school pupils in various categories of instructional objectives. Viz. Knowledge, Understanding and Application.

3. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils of Standard IX of different intelligence level – High, Average and Low.

The third hypothesis is significant for the experimental and control group of secondary school pupils. It means that there is significant difference exits in the mean scores of achievement in Hindi language of pupils of different levels of intelligence – High, Average and Low

4. There will be a significant difference in the mean scores of Achievement Test in Hindi Language among the pupils belonging to different levels of socio economic status, viz. High, Average and Below Average.

The fourth hypothesis is significant for the experimental and control group of secondary school pupils. It reveals that there is significant difference exits in the mean scores of achievement in Hindi language

of pupils belonging to different levels of Socio Economic Status, viz. High, Average and Below Average.

MAJOR FINDINGS

Major findings of the study are given below:

1. The analysis of the post-test scores revealed that there exists significant difference at 0.01 level in the mean scores of achievement in Hindi language of Modular Approach and Existing method of teaching among the pupils of Standard IX at the secondary school level. It means that the performance of experimental group is better position with respect to achievement in Hindi language than control group. It means that modular approach is more effective in Hindi language among the pupils of standard IX at secondary school level.

2. The analysis of the post-test scores at the knowledge level revealed that there is a significant difference at 0.01 levels in the mean scores of achievement in Hindi language of Modular approach and Existing method of teaching among the standard IX at the secondary school level. It means that the performance of experimental group is more than the performance of the control group under knowledge level. That is, the treatment, modular approach is more effective in Hindi language than the existing method of teaching at knowledge level.

3. The analysis of the achievement test scores at the understanding level revealed that there exists a high significant difference at 0.01 level in the

mean scores of modular approach and existing method of teaching among the standard IX at the secondary level. It revealed that the performance of the experimental, group is higher than the performance control group at understanding level. It concluded that modular approach is more effective in Hindi language than the existing method of teaching at Understanding level.

4. The analysis of the post test scores at the application level revealed that there exists a significant difference at 0.01 level. It indicated that experimental group is an advantageous position with respect to achievement in Hindi language. That means, modular approach is more effective than existing method in Hindi language at Application level.

5. The analysis of the Post-Test Scores at various levels of Intelligence such as High, Average and Low revealed that there exists a significant difference at 0.01 level. It revealed that the Experimental group of various levels of Intelligence is higher performance than Control group of various levels of Intelligence – High, Average, Low.

6. The analysis of the Post-Test Scores at various levels of Socio Economic Status such as High, Average and Below Average indicated that Modular Approach is more effective that in the existing method of teaching at various levels of Socio Economic Status – High, Average, Below Average.

From the above, it concluded that the treatment Modular Approach is more effective than the Existing Method to improve the achievement in total, various categories of objectives such as Knowledge, Understanding and Application in Hindi Language, various levels of Intelligence High, Average and Low and various levels of Socio Economic Status such as High, Average and Below Average among pupils at Secondary School level.

CONCLUSIONS

The conclusion that are arrived for the present study are:

- The modular approach is more effective than the existing method of teaching Hindi language among the pupils of standard IX at secondary school level (t = 11.716)

- Modular approach is more effective than existing method of teaching in Hindi language among the pupils of IX under the categories of the objectives, Knowledge, Understanding and Application.

    a) Knowledge (t = 8.524)
    b) Understanding (t = 8.934)
    c) Appointment (t = 7.324)

- There is a significant different between Modular Approach and Existing Method of teaching in Hindi Language among the pupils of different income levels at secondary school level.

    a) Knowledge (t = 13.82)

b) Understanding (t = 8.75)

c) Appointment (t = 3.57)

- There exists a significant difference between Modular Approach and Existing Method of teaching in Hindi language among the pupils belonging to different levels of Socio Economic Status at secondary school level.

a) Knowledge (t = 4.6)

b) Understanding (t = 3.21)

c) Appointment (t = 4.25)

RECOMMENDATION FOR IMPROVEMENT

From the findings, the investigator arrived at the following suggestions for improvement of teaching learning process.

1. Inservice courses should be organized for teachers to prepare modules for the subjects in which they are handling.

2. Teachers should be given more opportunities to participate such training courses. They may be given duty leave and other incentives for attending such courses.

3. While framing curriculum due importance may be given to modern methods of teaching. For this handbook and sourcebook may be prepared with the help of experts in the field and they

may be given to the teachers in advance for discussion before finalizing the curriculum process

4. Periodic training causes should be given to teachers according to the convenience. For this, a lead school may be selected for providing such training.

5. As present, the senior teacher is handling the training classes for the benefit of junior teachers. This makes a lot of problems among the teachers. Hence it is suggested that as in the case of Academic Colleges under U.G.C. for College and University teachers an 'Academic Institute' for training teachers be started on every districts for training to the teachers. The institute can obtain expertise from others faulty members of various colleges and universities.

6. Complaints are gallowed from various angles that teachers are not having enough expertise in the concerned subjects in which they are handling. Hence it is suggested that teachers may be given 'content orientation' according to subjects. These course can also be conducted under the leadership of the proposed Academic Institute. The courses may be conducted during the summer vacation for which the teachers are free to attend the course. The teachers may be given incentive for attending the course. For handling classes on subject orientation. the services of college and university professors may be utilized.

7. Now the teacher pupil ratio is 1:45. The strength is to be reduced to 1:25 so as to enable the teachers to provide individualized instruction.

8. Periodic workshops be organized for preparation of modules and supplied the teachers for teaching in advance so as to enable them to change according to convenience.

9. Findings of the study show that modular approach is more effective than the existing method. Then the investigator made discussions with certain experts and arrived at the conclusion that this method is not more effective in certain levels.

10. For this, materials should be developed in such a way that it should assure proper developments in all levels, and training should be geared towards that goal.

SUGGESTIONS FOR FURTHER RESEARCH

- The present study may be extended to large samples involving more number of units in order to examine the reliability of findings.
- The study can be extended to other school subjects also.
- A combined effect of various methods can be studied.

- The present study can be duplicated to other levels, such as upper primary, higher secondary and college levels.
- A survey on the teacher's attitude towards modular approach of teaching can be conducted.

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