CHAPTER-VI

SUMMARY
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The present study was planned to measure the effectiveness of Concept Attainment and Advance Organizer Models on students achievement in Economics. Growing population, shrinking resources, deviation from studies, deteriorating work-culture etc. compel us to think and devise innovations to make teaching economical and interesting. This challenge inculcated the investigator to undertake this investigation in the subject of Economics at the secondary stage of education which forms the basis for the life in future of every student.

6.1.1 INTRODUCTION

Education is the most cogent instrument in the progress of any nation, hence, the quality of education has to be improved for faster around development. It is universally acknowledged that any attempt at the improvement in the quality of education ultimately depends on the quality of instruction imparted in the classrooms. The purpose of education is to manage students’ learning and the value of any technology used in education must, therefore, be measured by its capacity to affect learning. In a wider perspective, technology today seems to hold out more benefits than ever before. Educational technology has exhibited a great amount of promise and potential in facilitating teaching and learning. It can help further in the development of need based courses, organization of content units, development of education programmes and procedure of their monitoring and feedback. Large scale experimentation spread over the whole world has changed the face of teaching-learning process and has put forth a number of teaching strategies, ratio, television, video cassettes, tape recorder, computer-assisted learning (electric and electric media) etc., along with various models of teaching. These are being increasingly used in the field of education.

Models of teaching are designed to impart repertoires while helping students learn information, ideas, academic skills, developing social skills,
values and understand themselves and their environments (Joyce and Weil, 1972).

Although some of the theories, on which teaching models are based, may not be very recent, yet the manner in which Joyce and Weil have intricately interlinked educational purposes, learning theories and teaching strategies, is novel and very promising. It includes a cause of its likely effectiveness and provides strategy to analyse the educative process. A teaching model includes patterns for designing educational environment through specified ways of teaching and learning, to achieve specific goals. The scope of research in this field is very vast because the concept of models of teaching is multidimensional. There is not one but many models and these models are at different stages of development. The work of Joyce Bruce and Marsha Weil (1972) is outstanding in the filed of transformation of theories of teaching into models of teaching.

A model of teaching is a plan or pattern that can be used to shape curricula, to design instructional material and to guide instructions in the classroom and other settings. These models are plans of the inter-relationship between various teaching-learning situations. These theories and models are very closely related to one another but are different from one another also. These models are templates of theories of teaching. Their functions are also different from one another. A theory gives the explanation of interaction among actual variables, while a model provides a cognition to the pattern of interaction.

A model of teaching consists of six fundamental elements, namely, focus, syntax, social system, principles of reaction, support system and evaluation system, Depending upon the different goals the various models achieve, they have been classified into four families by Marsha Weil and Bruce Jyoce. In each family there is a group of models.

The concept ‘Models of Teaching’ seeks to examine systematically the interaction among educational purposes, instructional strategies, curricular design and material and also social and psychological theory. Models are prescriptive teaching strategies designed to accomplish particular instructional
goals. Models describe the process of specifying the production of particular environmental situation which cause students to interact in such a way that specific change occurs in their behaviour. Indeed, models of teaching provide guidelines to the teachers in planning and organising their teaching activities.

‘Models of Teaching’ suggest interrelationships between various teaching and learning conditions. Generally, these models are patterns of theories of teaching. Indeed, the models are the buildings whereas the theories of teaching are the construction plans. However, models, being in their early state of development, lack factual support (Dececco and Crawfold, 1977).

Classroom problems are multidimensional in nature and can not be solved by insufficient knowledge acquired merely by studying the nature and factors of learning. Although efforts are being constantly made to develop the theory of teaching. So far, some educationalists have developed models of teaching by manipulating practical outlook of such theories.

A differentiation has been made by Silverman between some of the functions of theories of teaching and models of teaching. A theory is the explanation of the interaction among actual variables whereas model is analogous to this pattern and its evaluation is made by its use.

‘A model of teaching’ connotes a pattern or plan which can be taken up to shape a curriculum or course, to select instructional materials and to guide the teachers’ actions.

The models of teaching provide guidelines to teachers in planning and organising their teaching activities. These are useful in planning curriculum, student-teacher interaction, preparation of an outline for guiding students’ activities and in development of specific teaching aids.

According to Joyce Bruce and Marsha Weil (1972) “Teaching models are just pedagogical designs. They describe a way of specifying and producing particular environmental situations which cause the student to interact in such a way that specific change occurs in his/her behaviour”.

Some books such as, “Information Processing Models of Teaching”, by Joyce and Weil (1980) have defined the term model of teaching more clearly that it consists of ways of designing educational activities and
environments, it specifies the ways of teaching and learning that are intended
to achieve certain kinds of goals. A model includes a rationale, a theory that
justifies it and describes what it is good for and why, the rationale may be
given by observed evidence that it works.

An instructional model is not a substitute for teaching skills. Indeed, a
model can not take place of basic qualities in a teacher, such as, concepts of
subject matter, creativity and sensitivity to people. Rather, it is a good tool to
help teachers to teach more effectively, by making their teaching more
organised and efficient. Model provides the flexibility to allow teachers to use
their own creativity. An instructional model is a design for teaching with
which the teacher uses all the skills and insights at his or her command.

### 6.1.2 FAMILIES OF MODELS OF TEACHING

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Category of Model</th>
<th>Name of Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Information Processing Models</td>
<td>Inductive Thinking Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inquiry Training Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scientific Inquiry Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concept Attainment Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advance Organizer Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory Model</td>
</tr>
<tr>
<td>2</td>
<td>Social Interaction Models</td>
<td>Group Investigation Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social Inquiry Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laboratory Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Juris-prudential Inquiry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Role Playing Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social Simulation Model</td>
</tr>
<tr>
<td>3</td>
<td>Personal Models</td>
<td>Non-Directive Teaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Awareness Training Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Synectic Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conceptual System Model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classroom Meeting Model</td>
</tr>
</tbody>
</table>
INFORMATION PROCESSING MODELS

Information processing refers to the ways people handle stimuli from the environment, organise data, sense problems, generate concepts and solutions to problems and employ verbal and non-verbal symbols.

SOCIAL INTERACTION MODELS

These models give priority to improvement of the individual’s ability to relate to others for improvement of democratic processes, and for the improvement of the society.

PERSONAL MODELS

These models emphasize the processes by which individuals construct and organize their unique reality. They give much attention to emotional life.

BEHAVIOUR MODIFICATION MODELS

The emphasize in this group is on changing behaviour from less productive to more productive patterns. Behavioural models have wide applicability, addressing a variety of goals in education, training, interpersonal behaviour and therapy.

INFORMATION PROCESSING MODELS OF TEACHING

The models of this family share orientation towards the information processing capacity to master information. Some information processing models are concerned with the ability of the learner to solve problems and thus emphasize productive thinking, others are concerned with general intellectual ability. A large number of models emphasize concepts and information
development from the academic discipline. The route, however, is through intellectual functioning.

Seven models of teaching have been grouped under Information Processing Models. Each has a distinct goal. Table 6.1 gives the name of each model, with its goals and name of theorists on whose work the model was developed:

**Table 6.1 INFORMATION PROCESSING MODELS**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Models</th>
<th>Major Theorist</th>
<th>Mission or Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Inductive Thinking Model</td>
<td>Hilda Taba</td>
<td>Designed primarily for the development of inductive mental process and academic reasoning or theory building, also these capacities are useful for personal and social goals as well.</td>
</tr>
<tr>
<td>2.</td>
<td>Inquiry Training Model</td>
<td>Richard Such Man</td>
<td>Designed primarily for development of inductive mental process and academic reasoning or theory building, also these capacities are useful for personal and social goals as well.</td>
</tr>
<tr>
<td>3.</td>
<td>Scientific Inquiry</td>
<td>Joseph J. Schwds (also much of the curriculum reform movement of the 1960s)</td>
<td>Designed to teach the research system of a discipline, also expected to have effects in other domains (sociological methods may be taught in order to increase social</td>
</tr>
</tbody>
</table>
In the present study, the models whose effectiveness is to be investigated is that of Concept Attainment and Advance Organizer. Both these models belong to the family of Information Processing Models:

**Information Processing Models**

- Concept Attainment Model (Bruner) Inductive Thinking
- Advance Organizer Model (Ausubel) Deductive Thinking

Some of these models from Information Processing Family individually or collectively have been used for boosting the learning process in
specific areas of teaching, such as, concept teaching, problem solving, inferential teaching, concept learning etc. Learning mainly includes the learning of concepts and principles. Concept learning is a hybrid term consisting of two parts, namely, concept and learning. The meaning and definition of the term concept still lacks orientations and preferences. In the broad sense it can be said that concept is a general idea that stands for a general class and represents the common characteristics of all objects or events of this general class. In brief, a concept is critical component of an individual’s cognitive structure. In various academic fields, concepts are the building blocks for the structure of knowledge. All concepts possess, at least, four elements, namely examples, attributes, definition and hierarchical relations.

The process of learning begins with the birth of the child and continues till his death. As soon as he comes in contact with his environment, he starts reacting and in the process of interaction of the individual and his environment, the foundation of learning is laid down. The learning of concepts is of greater importance for human beings as they think, learn and communicate with the help of concepts.

The present age is the age of computerised industry and research. The exploding population in some areas of the globe along with shrinking resources compel us to produce and grow more under high economic conditions and also compels to explore space to find additional place and resources. This scenario has increased the importance of Economics manifold. So teaching/learning of Economics at all stages of life has assumed increasing importance. This process of teaching/learning can be made efficient and economic if suitable and convenient methods of teaching-learning are employed. Hence, the study in hand endeavours to measure comparatively the efficacy of two recent models of teaching, namely, Bruner’s Concept Attainment Model and Ausubel’s Advance Organizer Model.

Here an attempt has been made to evaluate the effect of Bruner’s Concept Attainment Model and Ausubel’s Advance Organizer Model on achievement in Economics.
The word ‘achievement’ refers to the relative position of a student in a group or class, regarding his attainment or proficiency or performance in a given skill or a body of knowledge. Intelligence is the basic concept of one’s ability to adjust adequately to new and different situation. In short, intelligence is global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment.

6.2.1 MEANING OF ECONOMICS AND IMPORTANCE OF TEACHING ECONOMICS

The term ‘Economics’ in English language has its origin in two Greek words : Oikos (household) and Nemein (management). Thus they mean ‘management of household’. Economics is a social science which studies how human beings make choices to use scarce resources to satisfy their unlimited wants. Tradition of Economics in India dates back to about 500 B.C. Kautilya, the famous thinker of ancient India, wrote the world famous book, ‘ARTHSHASTRA’, a treasure of knowledge for India.

As a social being, it is natural for man to depend upon others. This relationship has been growing and developing along with the development of the civilization and culture. Human relationships have grown complex. Human needs have become unlimited. Today it is not easy for man to discern which need is the main and which is subsidiary. There is a constant vissle for the achievement of the needs and fulfilment of the wants. In his attempt to fulfil his needs and satisfy his wants, man performs various activities. As wealth or money has the power to satisfy various needs and wants, most human activities are directed towards earning money and amassing wealth. In other words, most of the activities of man are economic activities which come under the subject matter of ‘Economics’. We can say that Economics has left no corner or sphere of human life untouched. It has a direct impact on society and modern man. It has significant importance in production, consumption, distribution, national income etc. So the entire global society must be literate in Economics.
6.2.2 RATIONALE OF THE PRESENT STUDY

Print materials are now and probably will remain an important resource in the classroom. A perpetual concern of educators is the preparation and use of materials that are organised in such a way that maximizes learning. A crucial area of interest among educators has been the development of techniques to facilitate students’ learning from text.

In India, teachers, by and large, are unable to adopt appropriate methods for teaching various subjects due to lack of comprehensive knowledge of such methods which consequently hinder student’s learning. The gap, could not be accepted in teacher training programmes. Even, otherwise there is a big break between the theoretical knowledge of teaching techniques and actual teaching practices in educational institutions. This problem can be avoided by increasing the professional competence of teachers through communicating to them exhaustive knowledge of the latest theory of teaching and of the teaching strategies perfected elsewhere.

Concepts play a major role in the entire human activity. People think, read, understand, communicate and construct theories with the help of concepts, so learning of concepts is fundamental for academic growth.

The comprehensive, lasting and productive learning of concepts can be achieved by proper management and manipulation of intellectual structure. Learning is deeply related with the intellectual structure of an individual. It is encouraged by chaining the new concepts, through links to the previously known concepts and ideas. In this way, new concepts make their place in the group of concepts in the cognitive structure of an individual.

The ideational relationships: connection can be established easily by understanding proper strategies. Such strategies can not be adopted indiscriminately. But these are compatible to the environment. It is important to find out strategies and methods of teaching, matching with the Indian environment, to accelerate teaching/learning.

The Concept Attainment Model developed from the work of Bruner (1956) is an approach to teaching which provides an insight into the thought
process of learners. This model supports both knowledge of attributes that reveal the concept and strategies for constructing the concept.

The second model, which is designed to strengthen students' thought process, is the Advance Organizer Model based on Ausubel's theory of meaningful verbal learning (1963). Ausubel points out the presentation of an 'Advance Organizer, as an explicit cognitive structure of the new concepts to be attained. According to Ausubel, this enhances the meaningful learning of the concepts. This link between cognitive structure and the new concept is called the 'Advance Organizer (AO)' or 'Cognitive Bridge' (Novak, 1977). In his view, the introduction of relevant subsumers, concepts (organisers) facilitates the learning and retention of new and meaningful material. He bases his hypothesis on the assumption that cognitive structure is hierarchically organized in which highly inclusive concepts are at the top and subsumers, less inclusive, sub-concepts and informational data are at the bottom (Ausubel, 1963): The advance organizers perform two different functions corresponding to two different aspects of the unfamiliarity of meaningful learning material. Firstly, they provide ideational anchorage when the new material is almost completely unfamiliar, that is, the cognitive is totally barren of related concepts. Secondly, the advance organizer increases the discriminability of new concepts from analogous and conflicting concepts and ideas in the learner's cognitive structure. The first model teaches concept inductively, whereas, the second model proceeds deductively. The Advance Organizer Model also aims at developing the habit of precise thinking.

Change is a very important phenomenon of the present age and it affects the life of each and every individual. The world of today is changing rapidly because of the fast changes in field of science, technology, economics, commerce etc.

To meet the demands of an increasingly complex world, classroom must be converted into a 'Learning Environment.' New innovations and discoveries are needed in every sphere of knowledge and all this require a spirit of developing logic, critical thinking, increasing reasoning ability, to show high achievements and attainments in all fields.
Economy and issues related to economics affect each and every sphere of one’s life. Hence, to make teaching of economics in schools according to the needs of twenty first century, the whole thrust must be on change from ‘memory based’ learning to ‘comprehensive based’ learning. Each concept of economics should be very clear to all the students. The students’ role is to master these concepts and information of economy organized and presented by the teachers to them. Therefore, serious research is needed to evolve effective methods of teaching economics at school stage.

As reported in the Fourth, Fifth and Sixth Surveys of Research in Education, there is need to investigate the effectiveness, usefulness and validity of models of different families, particularly of Learning from Information Processing.

So, the present study is conducted to investigate the effectiveness of concept attainment and advance organizer models in teaching ‘economics’– the subject having important place in school curriculum as well as in daily life.

6.2.3 STATEMENT OF THE PROBLEM
A comparative study of the effectiveness of Concept Attainment and Advance Organizer Models on students’ achievement in Economics.

6.2.4 DEFINITION OF THE TERMS USED
(i) CONCEPT ATTAINMENT
Concept Attainment or Concept Learning is a naturally occurring process in people of all ages. The process involves seeing similarities in the objects in the world, forming categories on the basis of similarities, and abstracting from the categories. In concept attainment, there is teaching of concepts through the use of examples.

(ii) ADVANCE ORGANIZER
The advance organizer model is designed to strengthen students’ cognitive structures i.e. a person’s knowledge of a particular subject matter at any given time and how well organized, clear and stable it is. In this approach,
the purpose is to explain, integrate and interrelate the material in the learning
task with previously learned material.

(iii) CONVENTIONAL METHOD OF TEACHING

In conventional method of teaching, the teacher is the only active
participant in the teaching learning process and the students are the passive
learners. The teacher gives home assignments and administers test
periodically. These tests are given only to give marks to students and have no
value in terms of improving the quality of instructions.

(iv) EFFECT

In this study ‘effect’ refers to a particular treatment given to a subject
to bring about desired behavioural change. This change will be observed in
achievement in Economics through both pre and post treatment criterion test.

(v) INTELLIGENCE

Intelligence is one of the intervening variables in the present study,
which is one of the most important variable that affects schooling. So this
variable has been briefly discussed henceforth.

According to dictionary meaning intelligence is, “The capacity to
acquire and apply knowledge”. Indeed, the basic concept of intelligence is that
it is the ability of adjust adequately to the new and different environment.

Stern (1914) argues that “Intelligence is a general capacity of an
individual, consciously to adjust his thinking to new requirements. It is a
general mental adaptability to new problems and conditions of life”. However,
Binet points out that intelligence is judgement or common initiative, the ability
to adapt oneself and again to judge well, understand well, reason well. These
are the essentials of intelligence.

In view of Weschler, “Intelligence is the aggregate or global capacity
of an individual to act purposefully, to think rationally and to deal effectively
with his environment”. Hollingworth says, “An intelligent person learns how
to do and how to get what is wanted.”
(vi) **SOCIO-ECONOMIC STATUS**

Socio-Economic Status is another intervening variable of present study. Social status is the position of the individual within the social relationships. It is that specific position of the individual in his relationships with other individuals by virtue of which he desires respect and prestige and whereby he exerts influence. It is known by the symbols or signs and actions of the respect rendered to him. The status in a group may be inherited. In modern society, the status is acquired. It is achieved on the basis of occupation, membership of certain associations and organisations, type of house in which a person lives, the area in which the house is situated, the ownership of various household materials, e.g., radio, T.V., machines, car, telephone and cellphone, etc. as well as the education, the type of schools in which he had studied, type of newspaper subscribing, caste and prestige acquired by the individuals. The economic factors play an important part in determining social status, which include the total income of the family, savings, capacity to collect money in emergency etc. therefore, it is better to call this factor as socio-economic rather than social or economic factors or status.

By the terms ‘socio-economic status’ we mean any group of persons coming closer to each other on the continuum of education, occupation, income, caste and culture. Charplin (1928) has offered most widely used definitions of socio-economic status as “the position that an individual or family occupies with reference to the prevailing average standard of culture, possession, effective income, material possessions and participation in group activity of community.”

The Michigan State Department of Education in conducting the state-wise assessment in 1971, defined socio-economic status similarly i.e. students’ socio-economic status is often thought to be a function of three factors (i) family income, (ii) parents’ educational level and (iii) parents’ occupation.

Socio-economic status, in the present study is measured with social class scale developed by Rajbir Singh, Radhey Shyam and Satish Kumar SES scores have been used to match the three groups.
(vii) **ACHIEVEMENT IN ECONOMICS**

It is the level of learning in a particular area of the subject in terms of knowledge, understanding, skill and application.

6.2.4 **OBJECTIVES**

1. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students to be taught Economics with and without the use of Concept Attainment Model, before experimental treatment.

2. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students to be taught Economics with and without the use of Concept Attainment Model, after experimental treatment.

3. To compare the gain scores, on criterion achievement test in Economics, of two groups of students, one to be taught Economics with Concept Attainment Model and other with Conventional Method of teaching, after the experimental treatment.

4. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students to be taught Economics with and without the use of Advance Organizer Model, before the experimental treatment.

5. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students to be taught Economics with and without the use of Advance Organizer Model, after the experimental treatment.

6. To compare the gain scores, on criterion achievement test in Economics, of two groups of students, one to be taught Economics with Advance Organizer Model and other with Conventional Method of teaching, after the experimental treatment.

7. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one group to be taught Economics with the use of Concept Attainment Model and other group
to be taught Economics with the use of Advance Organizer Model, before the experimental treatment.

8. To compare the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one group to be taught Economics with the use of Concept Attainment Model and other group to be taught Economics with the use of Advance Organizer Model, after the experimental treatment.

9. To compare the gain scores, on criterion achievement test in Economics, of two groups of students, one to be taught Economics with Concept Attainment Model and other with Advance Organizer Model, after the experimental treatment.

6.2.5 HYPOTHESES

H₁ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of the group of students taught Economics through Concept Attainment Model and the group of students taught Economics through conventional method, before the experimental treatment.

H₂ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of the group of students taught Economics through Concept Attainment Model and the group of students taught Economics through conventional method, after the experimental treatment.

H₃ There is no significant difference in the mean gain scores, on the criterion achievement test in Economics, of two groups of students, one taught Economics with Concept Attainment Model and other with Conventional Method of teaching, after the experimental treatment.

H₄ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of the group of students taught Economics through Advance Organizer Model and the group of students taught Economics through conventional method, before the experimental treatment.
H₅ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of the group of students taught Economics through Advance Organizer Model and the group of students taught Economics through conventional method, after the experimental treatment.

H₆ There is no significant difference in the mean gain scores, on the criterion achievement test in Economics, of two groups of students, one taught Economics with Advance Organizer Model and other with Conventional Method of teaching, after the experimental treatment.

H₇ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one group taught Economics with Concept Attainment Model and the other group taught Economics with the use of Advance Organizer Model, before the experimental treatment.

H₈ There is no significant difference in the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one group taught Economics with Concept Attainment Model and the other group taught Economics with the use of Advance Organizer Model, after the experimental treatment.

H₉ There is no significant difference in the mean gain scores, on the criterion achievement test in Economics, of two groups of students, one taught Economics with Concept Attainment Model and other with Advance Organizer Model, after the experimental treatment.

6.2.6 DELIMITATIONS OF THE STUDY

Keeping in view the time available and limited resources the study has been delimited as under:

1. The study could conducted on any class but it was delimited to the XIth class only.

2. Although there are various Teaching Models, the present study was confirmed to Advance Organizer and Concept Attainment models only.
3. The effectiveness of Concept Attainment Model and Advance Organizer Model was studied in the case of teaching of Economics only.

4. There are three variations of CAM (Concept Attainment Model), out of these three, only Reception Concept Attainment Model was used.

5. The study can be conducted on a variety of other educational outcomes but it was conducted only on achievement.

6. The sample of the study was selected through purposive sampling.

7. The treatment duration was 16 weeks only, each period was of thirty five minutes.

8. Only one criterion test was conducted to evaluate the effectiveness of teaching employed in this study.

6.2.7 PROCEDURE

The purpose of the present study was to compare the effectiveness of Concept Attainment Model and Advance Organizer Model on students' achievement in Economics. In this study, pre-test, post-test controlled group design was used. It involved three groups of students: the experimental group (E₁) taught Economics through Concept Attainment Model, the experimental group (E₂) taught Economics through Advance Organizer Model and the controlled group taught Economics through the conventional method of teaching.

The design consisted of three stages. The first stage involved pretesting of students on achievement in Economics, intelligence and socio-economic status. The second stage involved treatment of 16 weeks. The experimental treatment consisted of teaching of Economics through Concept Attainment and Advance Organizer Models and controlled group was taught through conventional method of teaching.

The third stage, the stage of post testing, included testing of achievement of students in Economics.
Table 6.2
DESIGN OF THE STUDY

<table>
<thead>
<tr>
<th>Stage</th>
<th>Duration</th>
<th>Control Group</th>
<th>Experimental Group (E1)</th>
<th>Experimental Group (E2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Treatment Administraion</td>
<td>16 Weeks</td>
<td>Teaching Economics through Conventional Method</td>
<td>Teaching Economics through Concept Attainment Model</td>
<td>Teaching Economics through Advance Organizer Model</td>
</tr>
</tbody>
</table>

6.2.8 SAMPLE

The sample was consisted of 90 students studying in XI class. The sample was divided into three groups. One group formed control group and the other two groups constituted the experimental groups E_1 and E_2. The sample was taken from Shri Ram Public School, Jawahar Nagar, Rohtak, D.A.V. Public School, Rohtak and Shiksha Bharti Public School, Rohtak. Thirty students from each school were taken.

The group-wise break-up of the students is given in the following Table:
Table : 6.3
GROUP-WISE BREAK-UP OF SAMPLE

<table>
<thead>
<tr>
<th>Name of School</th>
<th>Group</th>
<th>Group Treated as</th>
<th>Total No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shri Ram Public School</td>
<td>I</td>
<td>Experimental Group E&lt;sub&gt;1&lt;/sub&gt;</td>
<td>30</td>
</tr>
<tr>
<td>D.A.V. School, Rohtak</td>
<td>II</td>
<td>Experimental Group E&lt;sub&gt;2&lt;/sub&gt;</td>
<td>30</td>
</tr>
<tr>
<td>Shiksha Bharti Public School, Rohtak</td>
<td>III</td>
<td>Control Group</td>
<td>30</td>
</tr>
</tbody>
</table>

The experimental group E<sub>1</sub> having students from Shri Ram Public School, Rohtak, was given treatment according to lesson plans prepared by using CAM. The experimental group E<sub>2</sub> having students from D.A.V. School, Rohtak, was given treatment according to lesson plans prepared by using AOM. The control group having students from Shiksha Bharti Public School, Rohtak was given treatment according to the lesson plans prepared by conventional method of teaching.

6.2.9 TOOLS USED

In this study the following tools were used by the investigator:

1. Criterion Test in Economics (Based on objective type of items-Multiple Choice Type-MCT) was developed by the investigator by consulting the subject experts.
2. Lesson Plans developed by the investigator according to Concept Attainment Model, Advance Organizer Model and Conventional method of teaching.
3. Transparencies were also prepared by the investigator.
4. Jalota’s verbal Group Test of General Mental Ability to measure intelligence.
5. Socio-Economic Status Scale developed by Rajbir Singh, Radhey Shyam and Satish Kumar.
Information regarding students' age and marks obtained in 10th class were taken from school records.

**CRITERION/ACHIEVEMENT TEST IN ECONOMICS:**

A criterion test based on objective type of items was developed by the investigator. This test, given in Appendix-A, was administered as pre-test and post-test to measure the initial and terminal behaviour of students. The construction of the test was done by reading various criterion tests available in literature i.e. in different Economics books for the XI class, with joint efforts of subject experts. First of all, the behavioural objective of the test were framed.

The first step, in the construction of criterion test was content analysis of topics to be taught. The syllabus of Economics for XI class was thoroughly scanned, the contents were completely analysed by reading different books of class XI on Economics. Then questions were constructed. All questions were of multiple choice objective type.

The initial draft of the test was prepared. The test items were tried out on a pilot sample of 60 students. No time limit was fixed for completing the test. It was found that students took on an average 90 minutes to answer all the questions.

The marking was done using scoring key already prepared by the researcher. There was one mark for a correct answer and zero for an incorrect answer. Then in the light of this pilot study, confusions and ambiguities expressed by the students during the test, it was modified in material and language. The test (try-out) contained 100 questions. The final selection of the items was made on the basis of difficulty value and discrimination index of each item. The researcher retained those items for the final draft which were having internal consistency of 0.25 and higher. The items with zero discriminating power and negative discriminating power were discarded while selecting items for final draft. In this way, 75 items were selected for the final draft. The content validity of the test was established. Reliability of the test was computed by Kuder-Richardson (K-R) method. The reliability co-efficient
of the test was revealed to be equal to 0.83 which is quite high. Therefore, the criterion test in Economics was accepted as a reliable tool for the purpose of the present study. The time limit of the test was fixed one hour. The validity of the achievement test constructed for the present study was taken for granted. Before administering the test, instructions to the respondents were given. These instructions were printed on the front page of the test booklet, in order to give the students proper guidelines to take the test. For scoring purpose a scoring key for the test was constructed.

**LESSON PLANS**

The investigator consulted the several books, including Joyce and Weil (1990) for guidance in the preparation of the lesson plans, in addition to suggestions given by other Economics teachers. Before preparing the lesson plans, the syllabus was thoroughly read and the content was deeply analysed by reading different books on Economics of XI class. Three types of lesson plans were prepared by the investigator—using Concept Attainment Model (Bruner) Advance Organizer Model (Ausubel’s) and conventional method of teaching. The medium of instruction in the selected three schools being English, the lesson plans were prepared in English. As per the specific aid in normal lesson planning the transparencies related to the lesson plans (where needed) were prepared by the investigator and were shown to the students during treatment period with the help of a overhead projector.

**JALOTA’S VERBAL GROUP TEST OF GENERAL MENTAL ABILITY**

The investigator used Jalota’s Verbal Group Test of General Mental Ability for the measurement of intelligence of the experimental groups and the control group. For the following reasons the investigator decided to use this test:

(a) It is an standardised test and it can be easily administered.

(b) Separate instructions and extra time are not necessary for its sub-tests.

(c) The directions are simple and clear.
(d) The test items are so appealing that they give the necessary drive on the part of the students for taking the test.

(e) The test items do not need any precise arrangements to be made and can be administered under normal classroom conditions.

(f) The test objective is to measure ability rather than efficiency.

(i) VALIDITY OF THE TEST

The test was validated by Jalota and a similar validation was done to check content validity. However, the panel of experts in this included teachers, parents, guidance and counselling personnel.

(ii) RELIABILITY OF THE TEST

The investigator decided to use split half method to determine the reliability of the test. In this study, the reliability for the pilot sample was found to be 0.82. As such the Jalota’s Verbal Group Test of General Mental Ability was found to valid and quite reliable.

100 multiple choice items comparised the intelligence test. Time limit was 20 minutes. At the end of the test an answer sheet was given. The students were to respond to the items by writing their right answer or the answer sheet. In this study the test was given to groups I, II and control group.

(iii) SCORING FOR INTELLIGENCE TEST

This was done strictly according to the scoring scheme prescribed in Jalota’s manual. Hence each score of the student represented his or her intelligence scores for this study.

SOCIO ECONOMIC STATUS SCALE

To match the experimental and control groups on the basis of Socio-Economic Status, ‘Socio-Economic Status Scale’ developed by Rajbir Singh, Radhey Shyam and Satish Kumar was used. This scale is valid for both rural and urban people or having allegiance to both areas.
The validity of the present scale was 0.689 and reliability was found to be 0.791.

There are 25 statements in the scale. The scoring procedure is given in the scoring key. There was not time limit for completing the test scale.

6.2.10 CONTROLS APPLIED

To increase the precision of the investigation, due attention was paid to control different errors arising during the experiment. As pointed out by Linguist (1956) three basic errors arise in performing the experiment, namely; type S, type G and type R. Type S errors, which characterise simple random sampling, were minimised by group matching on age, academic achievement level, SES and knowledge of Economics.

Type G errors arise due to numerous factors in each group which tend to have same effect on all the subjects of one treatment group which thus creates systematic differences in the criterion variables from group to group. These group differences were minimised by assigning the same teacher i.e. the investigator herself, to all the three groups for administration of treatment. Every effort was made to administer the treatment under similar conditions. The R errors could not arise because there was no replication of treatment in the experiment.

Attention was also paid to establish proper rapport with the students to ensure a healthy interaction during pre-test, treatment and post-test. To eliminate the inter-group interactions the students of one school were given treatment with only one model, whereas, the students of other schools were treated with other models.

❖ Nature of School: The sample was selected from Shri Ram Public School, D.A.V. Public School and Shiksha Bharti Public School, all in Rohtak. These schools are situated in urban area of Rohtak.
❖ Grade Level: XI class selected for the present study and the grade level was thus kept constant/same during the study.
❖ Subject: all the three groups were taught same units of Economics.
Socio-Economic Status: This variable was controlled statistically by employing Analysis of co-variance (ANCOVA) for the scores obtained by administering Socio-Economic Status Scale developed by Rajbir Singh, Radhey Shyam and Satish Kumar.

Intelligence of Pupils: This variable can greatly affect the achievement of pupils. It was also controlled statistically by employing ANCOVA to the intelligence test scores which were obtained by employing Jalota’s Verbal Group Test of general mental abilities.

The independent variables, dependent variables and control variable with the kind of control employed in the study have been summarized in Table 6.4:

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Control Variable or Intervening Variable</th>
<th>Control Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods of teaching:</td>
<td>Achievement in Economics</td>
<td>- Nature of School</td>
<td>Administrative (all Schools belong to Urban area of Rohtak and same units of Eco. taught to all groups). Statistical Analysis of Co-Var.</td>
</tr>
<tr>
<td>i) CAM</td>
<td></td>
<td>- Subject to be taught</td>
<td></td>
</tr>
<tr>
<td>ii) AOM</td>
<td></td>
<td>- Pupil’s Socio-Economic Status</td>
<td></td>
</tr>
<tr>
<td>iii) Conventional Method</td>
<td></td>
<td>- Pupil’s Achievement</td>
<td></td>
</tr>
</tbody>
</table>

6.2.11 STATISTICAL ANALYSIS

Statistics has become an indispensable tool for research. It is fundamental to the proper analysis of data. In order to achieve the objectives of the study, the data collected were statistically analysed using the following techniques:
1. Analysis of covariance (ANCOVA) was used in order to adjust pupil’s achievement in Economics on intelligence and Socio-economic status. ANCOVA was used on pre-test, post-test and gain scores of achievement test in Economics.

2. Mean and Standard Deviations were computed in respect of intelligence, Socio-economic status and achievement.

3. ‘t’-test was employed for testing the significance of difference between the means of students’ achievement in Economics. This test was used on post-test and gain scores. The value of ‘t’ is computed with the help of the formula:

\[ t = \frac{M_1 - M_2}{SE_D} \]

\[ SE_D = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}} \]

Where

- \( M_1 \) – Mean of first group
- \( M_2 \) – Mean of second group
- \( \sigma_1 \) – Standard deviation of first group
- \( \sigma_2 \) – Standard deviation of second group
- \( N_1 \) – Number of students in first group
- \( N_2 \) – Number of students in second group

**FINDINGS OF THE STUDY**

On the basis of the present study the investigator has drawn following findings regarding the effectiveness of Concept Attainment and Advance Organizer Models on students’ achievement in Economics:

1. No significant difference was found in the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one taught Economics with Concept Attainment Model and the other with Conventional Method of teaching, at pre-test stage.
2. The group of students taught Economics through Concept Attainment Model has scored significantly higher on the criterion achievement test than the group of students taught Economics through conventional method, at post-test stage.

3. The group of students taught Economics through Concept Attainment Model has scored significantly higher gain on the criterion achievement test than the group of students taught Economics through conventional method, at post-test stage.

4. No significant difference was found in the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one taught Economics with Advance Organizer Model and the other with Conventional Method of teaching, at pre-test stage.

5. The group of students taught Economics through Advance Organizer Model has scored significantly higher on the criterion achievement test than the group of students taught Economics through conventional Method, at post-test stage.

6. The group of students taught Economics through Advance Organizer Model has scored significantly higher gain on the criterion achievement test than the group of students taught Economics through conventional method, at post-test stage.

7. No significant difference was found in the mean achievement scores, on criterion achievement test in Economics, of two groups of students, one taught Economics with Concept Attainment Model and the other with Advance Organizer Model, at pre-test stage.

8. The group of students taught Economics through Concept Attainment Model has scored significantly higher on the criterion achievement test than the group of students taught Economics through Advance Organizer Model, at post-test stage.

9. The group of students taught Economics through Concept Attainment Model has scored significantly higher gain on the criterion achievement test than the group of students taught Economics through Advance Organizer Model, at post-test stage.