CHAPTER I

INTRODUCTION
INTRODUCTION

1.0.0. The present study is concerned with the models of teaching. This study is entitled as 'An Experimental Study of the Comparative Effectiveness of Concept Attainment Model and Advance Organizer Model in Teacher Education Course'. The study primarily focuses upon the immediate impact of teaching, attitude towards teaching profession and participation level through Concept Attainment Model and Advance Organizer Model on the achievement of B.Ed. students in the selected topics of their Educational Administration and School Organization Course. The Concept Attainment Model propounded by Jerome S. Brunner and others has been developed from their work 'A Study of Thinking'. The Advance Organizer Model propounded by David P. Ausubel is based on the theory of Meaningful Verbal Learning. The Traditional Method has also been included in this present study to find out the effectiveness of Concept Attainment Model and Advance Organizer Model independently.

This study was posed to the following questions: How did CAM differ from Traditional Method? How did AOM differ from Traditional Method?
differ from CAM? What was the effect of treatment, intelligence, attitude towards teaching profession and their interactions on the overall achievement of student — teachers? How did the attitude of student-teachers towards teaching profession differ on the basis of models of teaching used in their training. How did the participation of student teachers differ in the development of lesson on account/difference through in model of teaching?

1.1.0. The Significance of the Study:

The Advance Organizers have been developed in different subjects at different levels. They have been compared with Traditional Method in terms of achievement of students. At school level Advance Organizer Model was found to be significantly superior to Traditional Method by Stenbrink (1970), Smith (1976), Alexander (1977), Thompson (1978), Giles (1981), Chitriv (1983). On the other hand Advance Organizer Model and Traditional Method were found to be equally effective by Schulz (1967), Neisworth (1967), Niesworth (1968), Livingston (1970), Barron (1971), Barnes (1972), Lucas (1972), Feller (1973), Goodman (1977), and Frost (1978) etc. At


From the foregoing presentation, it may be seen that Advance Organizer Model and Concept Attainment Model were found to be significantly superior to Traditional Method in terms of students achievement. This indicates that this area did not receive proper attention in India, however some of the research studies had been experimented in the area of Concept Attainment Model by Pandey (1981), Pani (1988), Passi, Singh and Sansanwal (1985), Antimadas (1986), Dass (1986), Sharma (1986), Gangrade (1987), and Sushma (1987) and in the area of Advance Organizer Model Satapathy (1987), Pania (1986), Senapati (1986), Budhisagar (1986) and Rajoria (1987).

In India at the College level, to the best knowledge of research only one study was conducted by Chitriv (1983) wherein Advance Organizer Model and Concept Attainment Model were compared in terms of the effectiveness of them which was entitled 'Evaluating Differential Effectiveness of Ausubel's and Brunner's Strategies for Acquisition of Concepts.
in Mathematics'. To fill in this gap the present study was undertaken.

1.2.0. Nature of Teaching

Teaching is the basis of the objectives guiding teacher education programmes as well as a process by which those objectives are attained and the main outcome by which the success of the programmes is judged. Models of Teaching applies to teacher education and teaching.

Smith (1961) described that the word "teach" has a long history. From early times, it has been associated with the word "Learn". "Learn" comes from middle English 'Lernen', meaning to learn or teach. 'Lernen' is derived from Anglo-Saxon 'Leornian', the base of which is 'lar', the root of 'lore'. "Lore" originally meant learning or teaching, but is now used to mean that which is taught, specially traditional facts and beliefs. Thus the words 'Learn' and 'teach' are derived from the same source (Oxford Universal Dictionary, 1953).

The purpose of teaching is to maximize learning. Teaching is often thought of as something that comes
rather naturally to people who know their subject. In general, it is thought that it is a simple process that produces simple outcomes (Gage, 1964), but according to Joyce and Marootunian (1967), teaching is an intriguing, important and complex process. It takes place in a complicated social institution, which is filled with diverse people. It is a fluid interplay of events. One can not just know the subject and teach it, because the subjects themselves are ever changing. According to Ausubel (1968), "the facilitation of learning is the only proper end of teaching." Teaching obviously includes transmission of information and creating appropriate situations and conditions of proposing activities designed to facilitate learning.

There is a controversy whether teaching is an art or science. According to Higget (1994), 'teaching is an art, not a science, principally because it involves human beings, their emotions and their values, which he regarded as "quite outside the grasp of science, and even threatened by attempts to apply scientific method can be employed in understanding more about teaching. He argued that artistic activities have inherent order and lawfulness
that make them quite suitable for scientific analysis. Moreover, he could see little danger to art itself in its scientific study. The artist whose lawfulnesses are revealed does not become an automation; ample scope remains for his subtlety and individuality". Gallagher (1970) had no doubt that teaching is an art, but thought that it could benefit by being less of one. In Gage's (1978) latter comment on the subject, he agreed that teaching is an art, but saw it as "a useful or practical, art rather than one dedicated to the creation of beauty and rather than the evocation of aesthetic pleasure as ends in themselves". In relation to decisions made concerning materials, pacing, and especially in face-to-face interactions with students, Gage saw much scope for intuition, expressiveness, improvisation and creativity, which are commonly accepted ingredients of artistry. The nature of scientific basis, said Gage (1978) is to be "established relationships between variables in teaching and learning". Some of these relationships are casual, as established through experimental rather than correlational research, the stronger the scientific basis. The stronger the latter is, the better will be opportunities to improve teaching.
It is true that teaching is a process by which teacher and students create a shared environment including sets of values and beliefs which in turn colour their view of reality. According to Joyce & Marootunian (1967), the teacher must learn to control five processes of teaching; firstly making and using knowledge, secondly, shaping the school, thirdly, teaching with strategy, fourthly creating interpersonal climates and fifth and lastly controlling a teaching personality. Brunner (1972) also emphasized four major features of theory of instruction in effective teaching (i) predisposition toward learning, (ii) structured body of knowledge, (iii) sequences of material to be learnt and (iv) the nature and pacing of reward and punishment. It means that a theory of instruction in teaching is concerned with how what one wishes to teach can best be learnt, with improving rather than describing learning.

1.3.0. Research On Teaching

The amount and the direction of research on teaching styles demonstrate vigorous changes during the past decade in the different phases.
Phase I: Validation of theoretically derived teaching construct

In the first phase during the 1960s and early 1970s, a flurry of studies attempted the validation of theoretically derived teaching construct. Several instrumentation breakthroughs (Medley & Mitzel, 1958), Flanders (1960) allowed the dominative versus integrative construct of Anderson (1939) and the teacher centered versus learner centered notion of Withall (1949) to be examined in classrooms. The research for the most effective teaching style was pursued with much excitement during this period.

Phase II: Specific Behaviour of Pupils

The next phase focused on specific behaviours that are related to learning outcomes of pupils rather than on global teaching styles.

Phase III: Research - Based Teaching Pattern

Within this phase, there is an attempt to develop generic patterns on styles that have broad utility as well as the possibility of synthesizing specific patterns effective for particular children in specific setting.
The research on teacher effectiveness has been consistently set in the framework developed by Mitze and elaborated by Dunkin and Biddle (1974). Mitze sketched four categories of variables: presage, context, process and product.

1.4.0. Methods Based Teaching

Teaching methods inevitably constitute significant aspects of the human effort to educate. These are the patterns of teacher behaviour that recurrent applicable to various subject matters, characteristics of more than one teacher and relevant to learning and may be considered a subcategory of educational methods which also include instructional devices such as teaching machines conventional and programmed text-books, simulations, films, and others such as inductive and deductive method, heuristic method, lecture method, discussion method, discovery method, problem-solving method and project method etc.

The origin of methodology in education can be traced to the ideas of Rousseau. In the eighteenth century, Rousseau provided some of the ideas for reforms in teaching which others developed and put into practice. The most important of these reforms was Pestalozzi who attempted to reduce the education
process to an organized routine, based on the natural
development of the child. Frobol, Herbart and
others succeeded. Pestalozzi, Herbart emphasized
educational development from experience and from the
environment, as contrasted with the Pestalozzi's
emphasis on mental development from within and
according to the organic law (Bining & Bining 1952).
The Heriartians' method of teaching consists of its
five steps: (a) preparation (b) presentation
(c) association (d) assimilation, and (e) application.

1.5.0. Models-Based-Teaching

There are varying instructional goals for
different classes and different subjects. We can
refer Bloom's taxonomy of educational objectives
which is categorised into three domains. They are
cognitive, affective and psychomotor. To achieve
these educational objectives or goals, different
teaching strategies must be practised by the teacher.
Model-approach to teaching was proposed by a number
of educationists and psychologists. Flander put his
interaction-analysis as a model of teaching and for
this approach he categorised the statements of
students and teachers into ten categories. Glaser
developed his stripped down model of teaching which after some modification is known as basic teaching model. He divided instructional material in his model into four components. These are instructional objectives, the entering behaviour of the students, instructional procedure, and the performance and assessment.

1.5.1. **Definition of Model of Teaching**

In the point of view of teaching according to Ausubel (1985), a model of teaching is a plan or pattern that can be used to shape curricula, to design instructional materials and to guide instruction in the classroom and other setting. The most important aim of any model of teaching is to improve the instructional effectiveness through an interactive atmosphere.

1.5.2. **Characteristics of Models of Teaching**

Most models of teaching serve as simplifying metaphors to reduce the fantastic complexity of human interaction as it occurs in the classroom. A model provides the answers to the four questions
1. What do we want to know?

ii. How will we describe what we see?

iii. How often will we look?

iv. How many variables will we use at the same time?

The answer to the first question sets the scope of the model — Is everything in the classroom be explained or just a few things?

The second answer indicates whether our descriptions will be general or specific, broad or detailed.

The third answer indicates the frequency of observation. Will there be several in one second or just one during the year?

The fourth answer is a little more difficult. The human mind can juggle about half a dozen variables at once. With this limitation, there has to be a balance between scope, specificity, and the number of variables. If the scope is the modest and the variables specific enough to be recognized, then a classroom teacher may be able to use them.
A good model is one that accomplishes its purposes with the fewest limitations. It specifies what is to be identified in the continuing flow of behaviour, it predicts how those things probably are related and its most important function is to show how all these separate things can be put back together (Dunkin 1987).

1.5.3. Families of Model of Teaching

Joyce and Weil (1985) organized the alternative models of teaching into four families. They are information processing, personal, social and behavioural. They stress that the different instructional goals would be realised by putting these models of teaching into action.

1.5.3.1. Information Processing Family of Models of Teaching

The models of teaching of this family are concerned with the organization and presentation of verbal and non-verbal symbols in a way that help in the formation of concept, solution of problem, development of social relationship and integrated personality. The important models of this family are:

(i) Inductive Thinking Model of Hilda Taba
(ii) Scientific Inquiry Model of J. Schwab
(iii) Concept Attainment Model of J. Brunner
(iv) Advance Organizer Model of David P. Ausubel
1.5.3.2. Personal Family of Models of Teaching

The models of this family are intended to develop the unique personality of the learner. These models pay more attention to the emotional life of the person and also focus on helping individual to develop a productive relationship with their environment. The most important models of this family are:

(i) Non-directive Teaching Model of Karl Rogers
(ii) Synectics Model of William Gorden.
(iii) Classroom Meeting Model of William Glasser.

1.5.3.3. Social Family of Models of Teaching

The models of this family are concerned with the social relationship of the individual with others in the society. These models aim at the development of social relationship, democratic processes and work productivity in the society. They are also concerned with the development of mind and the learning of academic subjects. Some of the important models of this family are:
(i) Group Investigation Model of Herbert Thelan and John Dewey.
(ii) Role Playing Model of Shaftel and Shaftel.
(iii) Social Simulation Model of Seren Boocock and Harold Guizknox.

1.5.3.14. Behavioural Family of Models of Teaching

The main thrust of these models is modification of the visible or overt behaviour of the learner rather than the underlying psychological structure and unobservable behaviour. The main psychological bases of these models are stimulus control and reinforcement as put forward in B.F. Skinner's theory of operant conditioning and Bandura's theory of these models are that they break down the learning task into series of small sequences of behaviour. Each behaviour is so designed that success is ensured; the learner actively responds to the situation to the problematic situation and gets reinforcement and feedback. Some of the important models of this family are:

(ii) Self-Control Model of B.F. Skinner.
(iii) Stress Reduction Model of Rimm & Masters.
(iv) Desensitization Model of Wolpe.
1.5.3.5. **Components of Models of Teaching**

The model of teaching consists of the following components:

(i) **Syntax** : It describes the phases of the model.

(ii) **Social System**: It describes the students and teachers' roles and relationships and the kind of norms that are encouraged.

(iii) **Principles of Reaction** : It explains the procedure in which the teacher deals with the reactions of the students.

(iv) **Support System**: It deals with the use of other teaching aids, human skills and capacities and technical facilities.

(v) **Instructional and Nurturant Effect** : It describes the direct and implicit results of instructions.

(vi) **Application** : It deals with the further applicability of the model for different curriculum and classes.

1.6.0.0. **The Selection of Models for the Present Experimental Study**

The researcher selected two models of teaching for his experimental research work. These are
'Concept Attainment Model' of Jerome S. Brunner and 'Advance Organizer Model' of David P. Ausubel. These models belong to the same family i.e. the Information Processing Family. Selection of the models from the same family facilitates contracts and comparison also.

1.6.1. *Concept Attainment Model*

Concept Attainment Model of Teaching has been presented by Brunner, Goodnow, and Austin. This model has been developed from the 'Study of thinking'. This model has its three variations. These three models have the same conceptual base but each has slightly different set of activities. These three different models are

(1) Reception Model
(2) Selection Model
(3) Organized Material Model.

In the present study the researcher has chosen the Reception Model of Concept Attainment, thus the description of only Reception Oriented Model is given here.
1.6.1.1. Reception Model of Concept Attainment

(1) Syntax: Syntax of the model describes the main steps of teaching through the model.

**Phase I: Presentation of Data and Identification of Attributes**

The teacher presents labelled 'Yes' and 'No' examples arranged from simple to more difficult. Students compared the attributes of examples and non-examples in order to identify the common attributes of 'Yes' examples. They then state the rule according to the essential attributes. This hypothesis a concept is formulated. This hypothesis is tested at phase II.

**Phase II: Testing Attainment of The Concept**

The students are presented unlabelled examples and are asked to identify those examples that are the correct examples of the concept. The students are also required to generate their own examples and thereby confirm or reject their hypothesis about the concept.

**Phase III: Analysis of Thinking Strategy**

The students discuss their hypothesis among
themselves and analyse the problem through which they attain the concept and their thinking process are analysed and discussed.

(ii) **Social System** : Prior to teaching with this model, the teacher chooses the concept, selects and organizes the material into positive and negative examples, and sequences the examples. In most cases teachers will have to prepare examples, extracting ideas and materials from texts and other sources, but designing them in such a way that the attributes are clear and that there are both positive and negative examples of the concept. The three major functions of the teacher during this step are to record, prompt (cue) and present additional data.

(iii) **Principles of Reaction** : During the teaching-learning process teacher supports the hypothesis formulated by the students. He or she helps the students to balance one hypothesis against another. There is a focus of specific feature of each example. Students discuss and evaluate their thinking strategies with proper assistance of the teacher.
(iv) **Support System**: Concept Attainment lessons requires material that has been designed so that concepts are embedded in the material, with positive and negative examples that can be pointed out to the students. The students' job in concept attainment strategy is not to invent new concepts, but to attain the ones that have previously been selected by the teacher. Hence the data sources need to be known beforehand and the aspect of concept attainment activity made visible. When students are presented with an example, they describe its characteristics (attributes), which can then be recorded in a column on a blackboard.

(v) **Application of the Model**: This model has the following application at the different level:

1. It is applicable to all ages and grade levels.
2. The use of model shapes the particular learning activity.
3. It can be used as a tool of evaluation of important ideas introduced earlier.
4. It is also used for opening a new conceptual area by initiating a sequence of individual or group inquiries.
(vi) **Instructional and Nurturant Effect**

Concept attainment Model has been designed to enrich the students on specific concepts and by the nature of concepts. They also provide practice in inductive reasoning and opportunities for altering and improving students' concept-building strategies. Specially with abstract concept, the model also nurtures an awareness of alternative perspectives, a sensitivity to logical reasoning in communication and a tolerance of ambiguity.

1.6.2.0. **Advance Organizer Model**

An important resource in the classroom is written material. A perennial concern of educators is the preparation and use of materials that are organized in such a way as to maximize of meaningful verbal learning is the Advance Organizer Model presented by David P. Ausubel. According to Ausubel's theory of meaningful verbal learning, advance organizers are introduced in advance of new learning task and are formulated so that they take into account ideas and concepts already existing in the cognitive structure of the learner. They are presented at higher levels
of abstractness, generality and inclusiveness than the material to be learnt, and they serve to provide specifically relevant anchoring ideas for the more differentiated and detailed material that is subsequently presented.

1.6.2.1. Types of Advance Organizer

Ausubol labelled two types of advance organizers depending on the learner's degree of familiarity with the material which is as follows:

(a) **Expository Advance Organizers:**

They provide a general model of class relationship as a general subsumer for a new class, subclass, and species before more limited subsumer are provided for the particular subclass or species. These are used when the material to be learnt is complete.

(b) **Comparative Advance Organizer:**

They are used with relatively familiar material. They are designed to integrate new concepts with basically similar concepts existing the cognitive structure, yet they are also designed to discriminate between the old and new concepts in order to prevent confusion caused by their similarity.
1.6.2.2. Description of the Model

The Advance Organizer Model of teaching is described into different steps which are as follows:

1) Syntax: The Advance Organizer Model of teaching consists of three phases.

Phase I: Presentation of Advance Organizer

During this phase, first of all the objectives are explained and clarified and after which the advance organizer is presented.

Phase II: Presentation of Learning Task or Material

At this stage, the learning material is presented. This is presented through lectures, films, scripts, discussion, experiences, extra-reading material etc. The learning material is organized in logical order. Attempts are made to maintain motivation and interests.

Phase III: Strengthening Cognitive Structure

At this stage, the cognitive material is strengthened. The purpose of this stage is to anchor new material with old. That is, 'integrative' reconciliation is brought about. This is brought about by asking the students to prepare the summary
of major attributes of new materials, repeat definitions, ask students to differentiate the closely related subjects.

(ii) **Social System**: In this model, the teacher retains control of the intellectual structure as it is necessary continually to relate the learning material to the organizers and to help students differentiate new material from previously learnt material.

(iii) **Principles of Reaction**: The teacher's solicited or unsolicited responses to the learner's reactions are to be guided for the purpose of clarifying the meaning of the new learning material, differentiating it from and reconciling it with existing knowledge making it personally relevant to the student and helping to promote a critical approach to knowledge.

(iv) **Support System**: Well-organized material is the critical support requirement of this model. The effectiveness of the advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.

(v) **Application**: The model has the following applications at the different levels.
(1) The Advance Organizer Model is especially useful to structure extended curriculum sequences or systematically in the key ideas of a field.

(2) It increases the learner's grasp of factual information linked to and explained by the key ideas.

(3) The model can also be shaped to teach the skills of effective reception learning.

(4) Whenever ideas or information needs to be presented, renewed, or clarified, the advance organizer is useful model.

(5) The activities designed to strengthen cognitive organization can be spontaneously applied to the clarification of ideas in whatever instructional context they appear, as can the technique of an organizer.

(vi) Instructional And Nuturant Effect: The instructional effects of this model are conceptual structures, meaningful assimilation of information and ideas. The model nurtures an interest in a inquiry and precise habits of thinking.

1.7.0. Statement of the Problem

The problem of the study was worded as follows:
"An Experimental Study of The Comparative Effectiveness of Concept Attainment Model And Advance Organizer Model In Teacher Education Course."

1.8.0. Objectives of The Study

The objectives of the study were:
1. to ascertain the change of attitude of student-teacher towards teaching profession taught through CAM and AOM,
2. to examine the immediate impact of teaching through CAM and AOM on the achievement of student-teachers, and
3. to ascertain the difference in the participation of student-teachers in the development of lesson taught through CAM and AOM.

1.9.0. Hypothesis

The following hypotheses were formulated for the present study:

1. There will be no significant difference in the change of attitudes of student-teachers towards teaching profession taught through CAM and AOM.
2. There will be no significant difference in the immediate attainment level of teacher education of student teachers taught through CAM and AOM.

3. There will be no significant difference in student teachers' participation in the class taught through CAM and AOM.

1.10.0. **Delimitation of the Study**

The following delimitations were made for the study:

1. Models of teaching is too vast and complex field. There are about 22 models of teaching presently available. It is neither feasible nor desirable to take more than two models in one research study.

2. The present study is restricted to a comparative study of two models of teaching namely CAM and AOM.

3. The population of the study is the three groups of student-teachers in the Department of Education, AMU, Aligarh. Each group consisted of 25 student-teachers. Therefore, the present study was to be confined to 75 student-teachers.
4. The study was confined to the B.Ed. students studying 'Educational Administration and School Organization' as a compulsory subject.

5. The study was further restricted to fifteen selected concepts from the course of Educational Administration and School Organization.

1.11.0. Definition of Operational Terms

The researcher has used term in his research with certain meaning. They have been given below:

Achievement - Accomplishment or proficiency of performance in a given skill or a body of knowledge.

Acquisition of Concept - Concept attainment or concept assimilation (as the case may be) determined by knowledge, transfer, heuristic transfer, short term retention and long term retention of concept.

Advance Organizer - Advance Organizer, an important content, may be a concept or statement of relationship, generally based on the major concepts, propositions, generalizations, principles, and laws of discipline.
Apptitude - Educational - A combination of characteristic, and abilities which considered together, can be used as a basis for prediction of a certain level of achievement that can be attained through further development.

Ausubel's Strategy - Ausubel's Advance Organizer Model with Syntax.

Bruner's Strategy - Bruner's Concept Attainment Model with Syntax.

Concept - A form of mental construct.

Concept knowledge - Recognition of concept learnt.

Concept transfer - Application and extrapolation of concepts learnt in situations similar to those presented during teaching.

Differential Effectiveness - Relative effectiveness for different student characteristics.

Discrimination - An ability to see slight difference between stimuli or objects.

Evaluation - Qualitative assessment by means of statistical significance.
Generalization - Tendency for a response which was not learnt by direct association with a particular stimular stimulus to accompany that stimulus. Educational technology term for arranging and designing learning resources to ensure that behavioural changes occurring at the point of instruction are sustained at other appropriate times and places.

Intelligence - The ability to make effective use of abstract concepts and symbols in thinking and in dealing with new situations.

Previous knowledge - Knowledge of related concepts acquired in previous grades and expected to have been retained.

Reasoning - The development of the meaning content of ideas through operating with symbols constituting propositions so that the propositions stand in serial order constituting argument or disclosure.
Scholastic Achievement - Knowledge attained or skills developed in the school subject usually designated by test scores or by marks assigned by teachers or by both.

Strategies of Learning - Patterns of behaviour described in activity sequence.
CHAPTER II

REVIEW OF RESEARCH
2.1. **Significance**

The purpose of the review of literature is to build up in the context and background of the research as well as to provide a basis for formulation of the hypothesis. Since a good research is based upon everything that is known in the area of research, the review of research provides to this effect. For progress to occur, it is essential that new work be based on and build on what has already been accomplished. The review of research helps the researcher to delimit and define his problem, and also, the researcher can avoid sterile problem areas. By reviewing the literature the researcher can avoid duplicating well established findings. It gives the investigator ideas for the problem and suggestions about research methodology.

Models of teaching is a new area introduced in India. It is under experiment to know the effectiveness of its different models at various levels of teaching. The researcher collected the number of research studies under the area of concept attainment Model (CAM) and Advance Organizer Model (AOM) of teaching in India and abroad.
2.2. Research Studies In India

The researcher collected 16 research studies which have been done in India on Concept Attainment Model and Advance Organizer Model.

2.2.1. Research Studies of Concept Attainment Model

Pandey (1981) evolved teaching styles on the basis of verbal interaction taking place in the classroom and determined the effect of teaching style on science concept attainment at various levels. The sample consisted of 24 postgraduate trained male science teachers having at least five years of teaching experience in secondary and higher secondary schools and 300 secondary schools students studying in class XI from five schools of Varanasi. Concept attainment test and Instrument for analysing verbal teaching behaviour developed by investigator, Group Test of General Mental Ability (Joshi), Calculation of percentages, Different Interaction Analysis Ratios, Analysis of variance and t-test were utilized. He found that Teaching styles had varying effects on both the levels of concept attainment as well as total concept attainment.
Giving background information encouraged students' participation.

Chitriv (1983) compared the effectiveness of Ausubel's strategy with traditional method on the various criteria of concept acquisition in mathematics. The sample consisted of three intact sections of eleventh grade chosen from higher secondary schools of Nagpur city. Ausubel group in his study was found to be significantly better than control group with regard to mean performance on concept knowledge test.

Antimadas (1986) developed the model competency of pre-service teacher trainees by adopting CAI with three different training strategies. The sample consisted of 55-B.Ed. students of the Education Department of Devi Ahilya Vishwavidalaya, Indore. 16 P.F. Cattell, Teaching Analysis Guide (TAB) by Bruce Joyce, Factorial Analysis of Variance with unequal cell size and one way ANOVA were utilized. He found that the three different training strategies were equally effective in terms of model competency of teacher-trainees at the end of the training and coaching stage.
Bihari (1986) studied the effectiveness of three training strategies in learning CAM in terms of teaching competency of student-teachers, in terms of understanding of the model; in terms of coaching through the model, in terms of reaction towards the model and in terms of willingness to implement the model. The sample consisted of 55 student-teachers studying in B.Ed. 'B' section of the Department of Education, D.A.V. Indore. He found that the three training strategies namely peer feedback and practice in quardo, peer feedback, and practice in pairs and demonstration followed by practice in quardo were equally effective for developing teaching competence.

Das (1986) studied the effectiveness of CAM in terms of teaching competencies of preservice student-teachers; the effectiveness of CAM in terms of training the model, the effectiveness of CAM in terms of reaction towards the model at various stages of training, the effectiveness of CAM in terms of coaching the model, and the effectiveness of CAM in relation to previous achievement. The sample consisted of 16 student teachers studying in B.Ed. 'B' section of the Department of Education,
D.A.V. Indore. He found that CAM is effective in developing the teaching competencies of pre-service student-teachers.

Passi, Singh and Sansanwal (1985) studied the effectiveness of CAM and ITM in terms of different levels. They found that training in concept attainment Model in the form of lecture, demonstration, discussion and peer practice feedback did enhance the understanding of teacher educator's theoretical aspect of CAM.

Passi, Singh and Sansanwal (1986) compared the competency in the beginning of coaching in school of student-teachers belonging to E₁ E₂ and E₃ groups; of the competency at the end of coaching in school of student-teachers belonging to E₁ E₂ and E₃ groups the reaction towards Concept Attainment Model of student-teachers belonging to E₁ E₂ and E₃ groups, the willingness to implement the model of student-teachers belonging to E₁ E₂ and E₃ groups, the reactions towards the selected model school students taught by student-teachers belonging to E₁ E₂ and E₃ groups; the competency at the end of coaching in school of student-teachers belong to E₁ and E₂ groups; the
reactions towards Inquiry Training Model of student-teachers belonging to $E_1$ and $E_2$ groups; the willingness to implement the Model of student-teachers belonging to $E_1$ and $E_2$ groups, and the reactions towards the selected Model by school students taught by student-teachers belonging to $E_1$ and $E_2$ groups. The sample consisted of 321 student-teachers and 2500 pupils having subjects from different age groups, socio-economic background, medium of instruction and nature of school. They found that mean competency scores of $E_1$, $E_2$ and $E_3$ groups differ significantly when competency at the end of PPF was considered as covariate.

Sharma (1986) studied the effectiveness of CAM in terms of achievement of students on attainment test based on the concepts taught in Chemistry, and the effectiveness of CAM in terms of reactions of students towards the new method of teaching. Sample consisted of 67 students of class IX from Kamla Nehru Girls Higher Secondary School, Indore. He found that the mean performance of the experimental and control groups on achievement test is not significantly different from each other.
Gangrade (1987) compared the achievement of science of class VIII students taught through combination of Concept Attainment Model and Lecture Method with those taught through Traditional Method by taking separately intelligence, attitude towards science and previous year achievement in science as covariates; the achievement of science of class VIII students taught through combination of CAM and LM with those taught through TM by taking separately intelligence, attitude towards science and previous year achievement in science as covariate; studied the contribution of intelligence, attitude towards science etc. The sample consisted of 104 VIIth and VIIIth classes students of science. He found that the combination of CAM with Lecture Method (LM) was significantly superior to TM in teaching Chemistry to class VII students when the groups were matched in respect of intelligence; attitude towards science and previous year achievement in science. The combination of CAM and LM was significantly superior to TM in teaching Physics to class VIII students. The intelligence was found to be contributing to the extend of 53% to the achievement in science. The total contribution of intelligence, attitude towards
towards science, achievement-value-anxiety and previous year achievement in science was 74.3%. Out of which intelligence contributed to the extent of 42% and attitude towards science to the extent of 25.8%.

Sushma (1987) studied the effectiveness of CAM, Biological Science Inquiry Model (BSIM) and TM to teaching on pupil achievement. The sample consisted of 102 girls of class VIII of Central Hindu Girls School at Banaras. She found that CAM was more effective than BSIM when students achievement in Biological Science was taken.

Pani (1988) compared concept attainment scores (CAS) of groups through Reception and Selection Strategies of concept attainment; and studied the effect of personality factors. The sample consisted of 30 students of class VIII in Gramin Jiwan Jayoti School at Rao. He found that the reception strategy and selection strategy were equally effective in terms of attainment of science concept.

2.2.2. An Overview of the Research Studies of CAM

The researcher overviewed the research studies of CAM at the different level in the following captions.
2.2.2.1 Understanding Level and Reaction Towards the Model

Before adopting any model of teaching, one should first know the understanding level and reaction towards the model. Passi (1985), Passi, Singh and Sansanwal (1986) and Bihari (1987) in their research studies found the significant favourable change among teacher-educators as well as student-teachers towards the understanding of reaction towards the theoretical aspect of Concept Attainment Model.

2.2.2.2 The Level of Classes and Subjects to Be Studied

The research studies had been conducted in India on Concept Attainment Model in the classes of VII, VIII, IX, XI and B.Ed. level with the subjects of science mathematics and B.Ed course with both the sexes.

2.2.2.3 Effectiveness of Concept Attainment Model Over Lecture Method and Traditional Method of Teaching

The research studies of Gangrade (1987) and Sushma (1987) showed the significant effect of CAM over LM and TM.
2.2.2.4. Effectiveness of CAM in Terms of Achievement

The research studies of Chitriv (1983), Das (1986), Sharma (1986), Gangrade (1987) and Sharma (1987) showed the significant effect of CAM in terms of achievement of students.

2.2.2.5. Personality Factors and CAM

Personality factors in the research study of Antimadas (1986) did not influence the model competency of CAM, however, the research study of Pani (1988) found very little effect of personality factors on achievement of students in CAM.

2.2.2.6. Participation Level

Pandey (1981) and Bihari (1987) observed the importance of giving background information and feedback to the students which had favourable effect on participation level.

2.3.0. Research Studies of Advance Organizer Model

Buddhisagar (1986) studied the effect of treatment, intelligence, attitude towards coaching profession and their interactions on overall achievement of students, the effect of treatment, intelligence,
creativity and their interaction on overall achievement of students; the effect of treatment, attitude towards teaching profession, personality and their interaction on overall achievement of students etc. The sample consisted of 139 student-teachers in the Department of Education in D.A.V. at Indore. She found that the instructional material based on operant conditioning model as well as AOII was significantly superior to the Traditional Method and the instructional material based on OCM and that based on AOM were equally effective when students' mean achievement scores were adjusted with respect to intelligence. Intelligence was found to be effective significantly on the overall achievement of students.

Panda (1986) determined the effect of Advance Organizer Model on learning from text material of ninth grade pupils, the effect of AOM and Traditional Method of teaching on the achievement of ninth grade pupils; and the influence interaction between methods of instruction, sex and criterion test. The sample consisted of 60 students of St. Harry High School of Indore. He found that the difference between the mean achievement of pupils studying through AOM, set induction and TM were significant.
Senapati (1986) compared programmed learning material, Advance Organizer Material and Traditional Method in terms of achievement of students studying through them; and studied the personality factors and their interaction with the treatment on achievement of students. Sample consisted of 139 student-teachers in the Department of Education in D.A.V. Indore. The AOM was more effective than both the PLM and TM in terms of achievement of students on criteria test. The personality factors did not influence the achievement of students on criterion test.

Rajoria (1987) studied the effectiveness of Advance Organizer Model and the Traditional Method. The sample consisted of 114 students of class VIII in Government Middle School No. 24, Indore. She found that the AOM was significantly superior to TM in terms of achievement in science of class VIII students when the groups were matched separately in respect of intelligence and previous year achievement in science.

Satapathy (1987) compared the relative effectiveness of Wholist (MIT₁), partist (MIT₁) and partist-first
demonstration approaches in terms of theoretical understanding of the model, competency in model, reaction towards the model and willingness for implementation of the model by taking abstract reasoning as covariate etc. The sample consisted of 36 B.Ed. student-teachers studying in the Department of Education, D.A.V. Indore. He found that the partist and partist first demonstration approaches were significantly more effective than wholist approach in terms of theoretical understanding of the model when abstract reasoning was taken as covariate whereas partist approach and partist-first demonstration approach were equally effective in terms of theoretical understanding of the model when abstract reasoning was considered as covariate.

2.3.2. An Overview of Research Studies of AOM.

The researcher overviewed the research studies of Advance Organizer Model at the different levels in the following captions.

2.3.2.1. Understanding Level and Reaction Towards the Model

The research study of Satapathy (1987) showed the significant favourable change among student-teachers towards the understanding of and reaction
towards the theoretical aspect of Advance Organizer Model.

2.3.2.2. The Level of Classes and Subjects to be Studied

The research studies had been conducted in India on Advance Organizer Model in the classes of VIII, IX and B.Ed. level with the subjects of science and B.Ed. course.

2.3.2.3. Effectiveness of AOI over Traditional Method of Teaching

The research studies of Buddhisagar (1986), Panda (1986), Senapati (1986) and Rajoria (1977) showed the significant effect of AOI over TM.

2.3.2.4. Effectiveness of AOI in Terms of Achievement

The research studies of Buddhisagar (1986), Panda (1986) and Senapati (1986) showed the significant effect of AOI in terms of achievement.

2.3.2.5. Personality Factors and Advance Organizer Model

It was found in the research study of Senapati (1986) that the personality factors did not influence the achievement of students.
RESEARCH STUDIES ABROAD
(CAI: )
2.3.0. The researcher collected 236 research studies experimented abroad on Concept Attainment Model and Advance Organizer Model.

2.3.1. Research Studies of Concept Attainment Strategies

Byors (1961) found that the strategies influenced efficiency of performance.

Gagne and Brown (1961) found the best performance for the guided discovery group, the worst performance for the rule-example group and intermediate performance for the discovery group.

Lemke (1965) found that the verbal comprehension factor was related to the task factors, which suggested that inclusion of additional factors from its domain might account for additional variance in the study of abilities and their relationships to concept attainment and information processing.

Meinke (1966) found no significant effects of variables, however significant interactions were found.

Nicholson (1966) found that the attainment of disjunctive concept was significantly more difficult than attainment of conjunctive concept.
Mascole (1967) found that significantly greater performance was demonstrated by groups having a course organized around the key conceptual schemes as compared to groups having a course not so organized.

Cutharle (1967) found no differences between the performance of the three experimental groups although each was significantly superior to the control group.

Alvord (1968) found that positive learn to learn (LTL) effects obtained control not be related to major changes in intellectual processes with increased learning opportunities components of learning variance predictable from ability and "task specific" measures reflect the high specificity of learning performance on Concept attainment problem for subjects at this age and level of development.

Carol (1968) found a significant relationship between cognitive level and performance, the formal group performed more efficiently than the concrete group.

Warthen (1968) found that expository learning group was superior to discovery learning group on concept knowledge test administered immediately after
instructional period, but on retention tests given after five and eleven weeks discovery group was found to be superior to expository group.

Billeh (1969) found that neither of the population of pupils was consistently superior in achievement on the concepts when compared to the other population indicating that culture did not seem to be a factor in learning the concepts. The ability effect was the same in the two national schools at the three levels of achievement for all concepts.

Jacobson (1969) found that the lower-socio-economic level children performed better with more concretely presented tasks.

Murphy (1969) found no significant differences on the variables of teacher delivering information, sanctioning obedience to rules and efficiency general.

Kornriech (1969) found significantly more students in the guided discovery group acquired the strategy than in the other two groups.

Seggie (1969) found that the conjunctive concepts were significantly easier to learn only when the
instructional period, but on retention tests given after five and eleven weeks discovery group was found to be superior to expository group.

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Seggie (1969) found that the conjunctive concepts were significantly easier to learn only when the
Subjects were required to classify the stimuli in positive and negative terms. Under neutral conditions no difference existed between two types of concepts.

Schutz (1969) found that each experimental group performed significantly better than control group if and only if the children had learnt both components before or during the experiment.

Tamppari (1969) found that each succeeding grade level achieved significantly higher means scores. The grade level and chronological age respectively were the most important factors in determining the level of concept attainment which I.Q. was the least important factors.

Chlebek (1970) found opposite the previous views (which stated that positive instances were used more efficiently than negative instance by naive subjects attempting to solve conjunctive concept problems and that difference diminished with practice) with subjects who were shown by only negative instances having systematically lower solution than those who were shown only positive instances and the difference diminished with practice.
Colton (1970) found that although gains were made in attaining some of the concepts, there was no pre-post change in the choices of "preferred companions" by the integrated or all while kindergarten children as a result of viewing either unknown same or opposite colour children portraying "teachers" in videotaped sequences.

Klausimier (1970) found that individuals identified as highly analytic solved the concept identification problem with greater ease than that did low analytic subjects.

Kyle (1971) found that participation did not appear to be a factor in the level of understanding. Level of achievement anxiety seemed to effect concept understanding and condition preference.

Seldon (1971) found that the effect of mode of presentation was significant while the effects of organization of materials and complexity of informational field were not found to be significant.

Schaeffer (1971) found no significant differences between reading approach and sensory activity approach.
Cason (1972) found that the violation of any assumptions resulted in an information processing model of concept learning more slowly.

Clissold (1972) found that subjects with a High Grade Point Average may complete the programmed materials in the least amount of time and with the least number of errors and that when a subject took a long time to complete the programmed materials, her achievement of learning sets decreased.

Gau (1972) found that instruction utilizing one, two or three enactive and/or iconic embodiments of concepts had essentially the same effect on the ability of average to above average fifth and sixth grade students to operate with a symbolic embodiment of the concept.

Gorden (1972) found that when meaningful materials permitted prediction of the most likely hypothesis, subjects took advantage of this early in the task. Similarly, when opportunities to test attributes were limited, more information was extracted by multiple hypothesis testing. Both of these procedures increased inferential strain but decreased the risk of not having sufficient information to attain the concept.
Lawrason (1972) found significant differences between the five treatment groups receiving both, concept definition and practice and the control group and found no significant difference, however, between the treatment given practice above, and the control group.

Wager (1972) found the significant effect of different sequencing strategies on concept attainment.

Barbara (1973) found that subjects studying expository lesson performed better than subjects studying discovery lesson and this result was most evident on questions which assessed inference of the concept.

David (1973) found two factors interactions significant on both 'the immediate test of Concept Understanding' and 'the Delayed test concept understanding'.

Mills (1973) found that for the high school population, the instructional use of the proposed model for motivation was effective in increasing concept attainment; for the undergraduate college population the model made no difference in concept attainment and for the graduate college population, the model had a positive effect on the concept attainment of the students.
Peters (1973) found significant difference between the good and poor readers who used the Test-book-Approach.

Bailey (1974) found that the canonical teaching procedure was adequate for permitting attainment of the specified instructional objectives.

Grabber (1974) found no significant difference between deductive expository and inductive discovery teaching strategies when desired outcome was an understanding of the ideas of science.

Leorn (1974) found that college quality point average scores had a significant positive effect upon concept attainment and the significant interaction was found.

Ngoi (1974) found an existence of a cumulative hierarchy to the levels of study.

Robinson and Gray (1974) found that additional variance was accounted for by cognitive style measure beyond that of verbal and non-verbal intelligence in relation to school learning.

Truminak (1974) found no significant differences in the treatment groups for concept attainment.
Feldman (1975) found that a rationally selected set of examples and non-examples was more facilitative than one example.

McMurray (1975) found that subjects who received wide variety of concept instances performed significantly better on the acquisition test than those who received a narrow repeated variety regardless of whether instances were presented singly or as matched pairs.

Simpson (1975) found that there was a higher score for subjects who had two levels of critical properties identified than subjects who had only one level of critical properties identified. There was an interaction between the two main effects variables for increasing correct response scores.

Shyers (1975) found no evidence of transfer of structure except in the presence of identical elements. However, training showed transfer to the overall concept of proportionality with both experimental groups making a significant gain from pretest-posttest.

King (1976) found no significant differences between the three criterion measures: knowledge, retention and heuristic transfer.
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Rottavina (1977) found a greater importance of information processing at the adolescent level than at the elementary grade level. Reading achievement was more powerful than prediction of behaviour.

Singleton (1977) found that subjects scoring below 20th percentile on intelligence were found to make a significantly greater proportion of such choices of discontinuity in the decrease in the redundancy with increasing age.

Threadgil (1977) found that on the mathematical concept attainment task, analytic students performed significantly better than global students and there was no significant interaction between analytic global cognitive style and two methods of instruction.

Bordelon (1978) found no significant relationships between comprehension and concept attainment.

Charles (1978) found that the use of non-examples may facilitate the acquisition of certain mathematical concepts.

Horak (1978) found significant differences favouring the inductive group between the group means on the analysis and transfer tests, and found inductive method
was better instructional procedure for the transfer of learning.

Jolly (1978) found that laboratory approach was as effective as lecture discussion method for teaching the concepts to average seventh grade students.

Stiff (1978) found that exemplification moves more beneficial to students with low relevant knowledge and characterization moves were more effective for students with high relevant knowledge.

Bachman (1979) found that verbal ability, cue relevance/saliency and task complexity are important mediators in the relationship between $F_1$ and concept attainment efficiency and success.

Putt (1979) found that the method of teaching heuristic strategies promotes desirable behaviour related to problem solving.

Bergman (1980) found that all subjects appeared to possess a categorical attitude, the ability to recognise the arbitrariness of a category and the ability to be able to consider a whole system.

Contensa (1980) found that particular student-factors are related to level of cognitive development. There
was no significant relationship between students personality factors and concept acquisition.

Lettieri et al (1980) found that the programme of attribute materials following the Dieve's approach was effective in facilitating first grade and second grade children's development of the concept of number.

Miller (1980) found that the results of the study were inconsistency with Bruner's theory of cognitive growth.

Rollens (1980) found that 80% level of mastery was attained by the seniors on the earth concepts. Seniors from schools in the second largest size range, made student and student with more than two years of science background attained significantly higher score.

Simon (1980) found that in the concepts identification negative instances were more difficult to use than the positive instances.

Fulton (1981) found that there were a significant means score differences between the control group and method A the science concept test.

Cook (1981) found that students receiving positive and negative instances treatment did significantly better than receiving only positive instances.
Krishan (1981) found that two groups of subjects professional and non-professional did not differ on concept attainment scores.

Musa (1981) found that abstract pictures had significant effect on concept attainment, while cognitive style did not produce any effect on concept attainment.

Rave (1981) found that there was a positive relationship between the type of narrative reading and the recall of science concepts.

Sheel (1981) found no significant difference between two treatments, one of which was presentation of positive and negative instances and the other a controlled treatment in which only examples were presented.

Sioken (1981) found that proficiency of preservice teachers in teaching concepts was not improved by concept attainment strategies.

Yandila (1981) found that category to generally held opinion by Zambiab science teachers students at the junior secondary school level can learn selected genetic contents.
Cantor (1982) found that both reception and discovery learning were equally effective with regard to performance on the tasks similar to the training task and equally ineffective for the performance on the tasks differing from the training task.

Urbanski (1982) found that the amount of relevant knowledge increased so did the test performance. The number of moves factor containing the zero move, one move, seven moves and thirteen moves affected concept attainment significantly.

Beison (1983) found that both the concrete operational learning strategies were effective instructed methods in facilitation of long term and short term human genetics concept acquisition.

Galabaki (1983) found that although the experimental groups performed significantly better than the central groups.

Gerston (1983) found that direct instruction produced significantly higher scores on multiple choice test and essay test.

Lee (1983) found that there was a statistically significance difference between instruction based on the definitions and examples, and based on the examples only form.
Nuzum (1983) found that a method which included instruction to mastery in analysis, task specific and procedural knowledge was responsive to the needs of the learning disabled in this study.

Stout (1983) found negative instances to be a powerful aid in concept learning in the seven dimension focussing strategy for both concepts.

Crisman (1984) found that students scored significantly better when examples were presented. Sequence was important only in the case of the more complex rational concept where students scored significantly better when the definition and the attributes were presented prior to the presentation of examples. There was no significant difference in concept attainment when the oral and written modes were compared.

Vermetts (1984) found that examplar intensity did not affect learning of concept.

Beyerback (1985) found that more advanced studies adopted the instructor's overall organising concepts more so that less advanced students' concept maps seemed useful in providing information on the particular content.
Boomer (1985) found that a single concept could be taught three language delayed subjects and that the learning was a function of the computerized instruction.

Farks (1985) found that in the learning style by concept learning strategy format interaction; field independent students scored significantly higher on the retention test with a counter type discrimination format than with the prototype building format.

Hancloskly (1985) found that the analysis group performed significantly higher than the advance organizer and concept elaboration groups in both concept and principle learning.

Hart (1985) found that there was a significant difference for left synectic placement over the central orientation as well. Field independent made subjects scored significantly higher than field-independent females and significant differences for and between the poles of field articulation occurred with the right placement.

Ivins (1985) found the sequence of instruction in which laboratory activities were used to introduce concepts increased achievement and attitude for science
and laboratory activities also helped students to develop a stronger cognitive structure by establishing mental image for students that provide a route to long-term memory.

Johnson (1985) found that highly significant effects of verbal description and number of exemplars were found for subjects in the secondary school level with support for the premise that verbal description would promote learning of the style category presented. It also strongly supported the prediction of success for subjects receiving instruction with the larger set of exemplars.

Me Nemar (1985) found significant interaction between the sequence conditions and the frequency conditions.

Shepherd (1985) found significant correlations between both the formal and concrete concepts and all background variables with exception of age, for both classifications of concepts and significant correlations with concrete and formal concept understanding.

Vermont (1985) found that the three methods were equally effective when used to teach various aspects of the male concept.
Woodward (1985) found significant differences on basic facts and concepts that were reinforced by the simulation. Arnet (1986) found that feedback need only be provided to those students who fall below the desired mastery level set by the instructor of that course when using a lesson constructed using Gagne's nine events of instruction.

Bernt (1986) found that current Models of problem solving and hypothesis testing among young school children, methodological issues surrendering the use of the concept identification paradigms as means of studying children's cognitive skills were also considered.

Blalock (1986) found that kindergarten children achieved equally well using manipulatives and worksheets when lessons were presented with equal length and number of lessons.

Bodolus (1986) found that the experimental and traditional groups did significantly better on the context post-test than the control group while the experimental group using the mapping process did only slightly better than the traditional group.
Dalton (1986) found that teachers using these two strategies (Concept Attainment and Synectics) reported nearly twice as many thoughts related to both objectives and instructional procedures.

English (1986) found that although individual differences in conceptual knowledge were apparent, incorporating them into the model did not improve prediction of choice.

Geibprasert (1986) found significant differences between the pre-test and post-test means, across all treatments and for all levels of mathematics. No significant differences were found between treatments with respect to the levels of mathematics achievement.

Gibson (1986) found that the use of counter examples facilitated the learning of more difficult mathematical concepts and the performance of more difficult mathematical tasks.

Johnson (1986) found that the results in the analogy groups used analogies more frequently in essay responses than did students in the literal groups, but did not appear to use the analogies as conceptual organizers.
Keller (1986) found that the presence of the best examples and the generality significantly improved remembering of the generality for both types of content.

Larsen (1986) found no significant difference in clinical judgement between hypotheses formation training and control subjects when conceptual level was covariated, indicating that the hypothesis formation training did not enhance the clinical judgement skills of the training subjects.

Lynch (1986) found that sex, developmental level and filmic coding elements all significantly affect the mastery of the spatial concepts being studied.

Mc Donald (1986) found statistically significant differences between locus of control, strategy utilization and number of traits to solution.

Mc Intyre (1986) found evidence for the initial development of and continued improvements in concept core, the development of associations, and increased strength of knowledge occurring with continued instruction.
Oeballas (1986) found that for the age group of fourth graders, inductive and deductive approaches are equally effective in promoting concept formation/concept attainment and in fastening the metacognitive strategies that are crucial to higher-order thinking.

Piper (1986) found that there was the possibility of the learning of the concepts being transferred on a horizontal orientation (seventh grade life science and seventh grade unified studies) and on a vertical orientation (from one level of science to another, higher grade level of science).

Ponick (1986) found no significant difference among the treatment groups. A significant difference was found in favour of the animation treatment.

Rosen (1986) found that a reconceptualization of the precalculus course is recommended to enhance acquisition of meaningful insight.

Roth (1986) found that out of six different text processing strategies, five strategies were ineffective than with the text knowledge. In helping students appropriately change their micro-conceptions and integrate than with the text knowledge. Only one strategy was effective in helping students undergo such
conceptual change learning.

Rimore (1986) found that the students weak both conceptually and mechanically.

Smithson (1986) found that the result supported the existence of strategy preferences in learning disabled children and supported the use of matched strategy techniques in intervention.

Watson (1986) found that incentive motivation was not a significant factor in any of the tasks, nor did its effect change from task to task. Incentive and information did not interact in any of the models tested.

Al-Sulman (1987) found no significance difference to exist in the measure of an understanding of longitude and the causes of the changes of the seasons. A significance difference was obtained for the category of attributes. Concept attainment was mostly directly impacted by the parent's educational background and the degree of mobility experienced by the students.

2.3.2. An Overview of Research Studies of Concept Attainment Strategies

There were different strategies of concept

In the Concept Attainment Model, the teacher chooses the concept, selects and organizes the material into positive and negative instances and sequences the examples. Chlebek (1970), Feldman (1975), Gage (1977), Cook (1981), Keller (1986) found that positive instances were used more efficiently than negative instances, where as negative instances were found to be a powerful aid in concept learning in the research studies of Simon (1980), Sheel (1981) and Stout (1983).

There are two types of concept conjunctive and
Disjunctive. Nicholson (1966) and Chlebek (1970) found that disjunctive concept was significantly more difficult than attainment of conjunctive concept.

On the basis of certain assumptions and hypotheses, the researchers conduct their research studies. Cason (1972), Larson (1986) found that violation any assumption/hypothesis formation resulted in an information processing model of concept learning more slowly.


The selected factors like abilities, span of attention rote memory, task, reasoning domain, deduction and spatial scanning and cooperative conditions showed effect on concept attainment process supported by Lemke (1965), Billeh (1969),
As far as learning is concerned, it would be more effective if it is to be transferred in another situation. Shyers (1975), Horak (1978), and Piper (1986) found the significant transfer of learning/concepts in their research studies.

It had been found by Schutz (1969), Herkin (1977), Rottavina (1977), Nuzum (1983), Woodworth (1985) and Smithson (1986) that the concept attainment strategies were also responsive to the needs of the learning disabled/mentally retarded learners problem solving situation and in attainment of several concepts in teaching-learning process.

2.3.3. Research Studies of Advance Organizer Model

Ausubel (1960) found the significant difference between means of experimental and control groups at 0.01 level in favour of the group using the expository advance organizer.

Ausubel and Fitzgerald (1961) found that on the post-test the comparative organizer was found to be
significantly higher (PL .05) when compared with the expository organizer and the historical introduction. On the delayed posttest both the expository and the comparative organizer were significantly higher (PL .05, PL .02) when compared with the historical introduction.

Ausubel and Fitzgerald (1962) found significant results for the lower one third group in favour of the expository organizer (PL .01).

Ausubel and Youssef (1963) found significance in favour of the advance organizer (PL .01) when verbal ability was held constant by means of analysis of covariance. When knowledge of Christianity was held constant, the performance of the advance organizer group was significantly higher at the .05 level.

Shulz (1966) found that advance organizers do facilitate learning when pupils lack the processing skill necessary to reorganize information independently into suitably clear, inclusive and stable cognitive structure even though his statistical differences were not significant.

Woodward (1966) found no significant differences between experimental and control groups.
Jerralds (1967) found no significant difference between the means of the advance organizer and the modified advance organizer groups.

Neisworth (1967) found no significant difference in achievement between groups.

Scandura and Wells (1967) found that the advance organizer was superior to the historical introduction.

Neisworth (1968) found no significant differences between the advance organizer group and the control group with the Educable Mentally Retarded students.

Grateluescher and Sjogren (1968) found that the experimental treatment of new materials but also facilitated transfer, especially when the learning material was presented in a partially sequenced manner.

Allen (1969) found that advance organizer enhanced learning for above average students as measured by the delayed posttest, but that it had no facilitative effect with less able students.

Bauman, Glass, and Harrington (1969) that the post organizer groups scored significantly higher (PL .05) than the advance organizer groups in all three experiments and that
placing the organizer after a lesson had a greater facilitative effect than did the advance organizer.

Brovey (1969) found that subject receiving advance organizing information did not show significantly greater acquisition and retention than subjects receiving on historical introduction prior to a field experience.

Townsend (1969) found no significant difference between the scores of these subjects who received the advance organizer and those who received the traditional introduction.

Weisberg (1969) found a significant difference between map as graph organizers and verbal advance organizer.

Livington (1970) found in each of his experiments the control group scored higher, but not significantly higher than the advance organizer groups.

Steinbrink (1970) found a significant difference (PL .05) in favour of the advance organizer.

Barron (1971) found no significant difference in favour of the organizer treatments at any grade level.
Ethirveerasingam (1971) found no significant differences between treatments, and also no significant interactions between retention and treatment.

Hershman (1971) found no significant differences that could be attributed to treatment effect with assurance; the behavioural objectives were more able to help the lower ability students in most of the cases; and the motivation and level of aspiration of the students were the decisive variables that marked the treatment effects.

Munford (1971) found no significant differences among the groups in the amount of initial learning or retention.

Barnes (1972) and Clawson (1972) found no significant difference in favour of the groups using advance organizers.

Graber, Means and Johnson (1972) found no significant differences among groups.

Lucas (1972) found no significant differences in favour of any of the organizers.

Mxt (1972) found no significant differences for treatment effects recitation instructor effects, nor interaction.
Anderson (1973) found that the pro-organizer group did significantly better when each of these cognitive levels were considered separately.

Barrow (1973) found that the study did not demonstrate Joyce and Weil's assumption that advance organizer would effect active learning situations positively.

Caponechi (1973) found no significant differences among groups when subjects were classified according to ability based on ACT English and mathematics scores.

Feller (1973) found that neither advance organizer facilitated learning facts, comprehension, or application and found no interaction between treatment and I.Q when students scores were analysed by three I.Q. levels.

Moore, Barnes and Barner (1973) found no significant differences among groups on either tests.

Sowder, Nisser, Flora and Bright (1973) found no significant difference between groups when understanding of mathematics, the subject being studied, was compared with the treatment used.

Felker (1973) found no significant performance differences between having and not having advance
organizers and found no significant interaction effect.

Carol (1974) found that boys with relational styles were at a disadvantage in learning expository science material.

Johnes (1974) found that advance organizers provided significant facilitation only in terms of short-term retention.

Graber (1975) found that no organizer was significantly superior to the other, and there was no significant advantage for one rate of questioning over another.

Kennedy (1975) found that the comparative advance organizers and historical introduction had significant effects on total gain scores but such effects were not found for the subjects.

Maher (1975) found that advance organizers in the form of interpretive objectives and questions aimed at these objectives following the reading assignment, provided for significant improvement on the interpretive section of the California Reading test.

Saretskey (1975) found that there was no significant difference for use or non-use of advance organizers.
Main effects for reading ability level and for different prose passages were found significant. No interaction effects were significant.

Marchison (1975) found that I.Q. and Motivation were each significant and treatment differences were significant. Interaction was found among I.Q. Sex and treatment.

Callichan (1976) found that the general use of advance organizers to facilitate the learning and retention presented in a college level mathematics lecture is questionable.

Kersten (1976) found no significant difference between advance organizer and control introduction means for either test in either experiment.

Smith (1976) that advance organizers seemed to have effect on long range retention.

Travers (1976) found that the course independent of the use of advance organizers did not increase the performance of the students.

Alexander (1977) found that when constructed judiciously and used wisely, non-written cognitive organizers
facilitate not only learning of oral instruction but even more efficiently they facilitate the retention of it as well.

Goodman (1977) found no significant effect due to treatment and no significant interaction.

Parisi (1977) found no significant differences between responses of students who had worked with one of the instructional designs including the theoretical concepts as opposed to those who had worked with a version not including theoretical concepts.

Richards and McCormick (1977) found that the whole and part method of presenting advance organizers yielded equivalent recall of passage information, and neither experimental group exceeded the control group in this regard. However, both advance organizer groups produced significantly more recall than the control group of the organizers themselves.

Salman (1977) found the oral advance organizers or learning passages in conjunction with either written or oral learning passages provide no differentiation in learning or retention with verbally sophisticated subjects.
Zakkour (1977) found that cognitive organizer did not provide any facilitating effect in the learning and retention of mathematics as was shown by the lack of significant differences among groups and between opposite performances for each personality dimension.

Derr (1978) found that students who had either behavioural objectives or sample tests as advance organizers did better on posttests than students who had no organizers, comparison of cell means indicated that sample tests were more effective organizers than objectives.

Frost (1978) found no differential effect of organizer types on test performance.

Geiger (1978) found that Advance Organizer format did not have a significant effect on learning and there was a trend for the visual advance organizer group to achieve higher scores on learning and retention posttest.

Oppong (1978) found that the use of advance organizer before each text chapter showed significantly superiority in achievement when compared with the non-organizer group using text material only.
Phelps (1978) found no significant differences in the posttest scores associated with the three treatments: visual advance organizer, verbal advance organizer and control group.

Stallan (1978) found no significant difference between mean gain scores of the three groups.

Karchak (1978) found that advance organizers containing evaluative type questions produced lower posttest scores for average and low readers.

Sylves (1978) found no significant differences in the effect of an advance organizer on the learning of bright students when compared with slower students.

Varona (1978) found that learning was enhanced for those students receiving the advance organizer treatment even though the mean scores were not significant.

Josephson (1978) found that advance organizers facilitated retention for haptic individuals than for visual individuals. The significant interaction indicated that the cognitive style was a key factor in determining when the use of advance organizers will be successful in a mathematics classroom setting.
Keen (1979) found that the structured overview was more effective in facilitating comprehension of the reading task than guide material for all reading ability groups. There was no interaction among sex, treatment, and reading ability.

Meena, Victor George (1979) found that both written and graphic advance organizer treatment were significantly superior to non-organizer treatment.

Satterly and Telfer (1979) found significant differences between cognitive styles in recall and transfer and between learning and retention.

Schwartz (1979) found that the significant main effects provided support for Ausubel's theory regarding the ideational scaffolding provided by the advance organizer and the facilitation of learning new material when relevant prior knowledge subsumers were available.

Bartel and Heckman (1980) found a difference of 3.3 percentage points between means favouring the Personalized System of Instruction group with high human interaction over the advance organizer group.
Darrow (1980) found that advance organizer and the conventional overview treatments were equally effective for both measures.

Dena (1980) found that although the graphic advance organizer did not facilitate comprehension of single theme text, it did facilitate comprehension of multi-themed text. The graphic advance organizer strengthened retention of context, and below level, at level, and above level readers benefited similarly from the use of the graphic advance organizer.

Lali (1980) found that advance organizers significantly increased performance on teacher made test.

Lance (1980) found that the result of study did not support Ausubel's advance organizer theory. The theory appeared inappropriate when applied to improving reading comprehension in sociology.

Lemke (1980) found that the programmed instruction seemed to provide more effective learning than that taking place through use of a study guide using advance organizers as an ancillary method of instruction.
Martin (1980) found that the usage of comparative organizers improved retention of the theoretical concept of the study.

Morganett (1980) found that either the advance organizer was ineffective given the type of content and/or subject used or subjects failed to use their knowledge of the advance organizer to facilitate learning and retention.

Pathania (1980) found that the significant difference between the mean achievements of students studying the text material with advance organizers and without advance organizers.

Pyros (1980) found no significant main effects or interactions on either the immediate or delay testing in either content area.

Roper (1980) found no significant difference in the effect of intellectual level of students on their production of subsumer and no interaction between the students intellectual level and the advance organizer treatment.

Singleton (1980) found that advance organizers did not significantly effect students' ability to comprehend and retain textual material.
Wilson (1980) found that the comparative advance organizer did had a significant effect on learning a new motor skill.

Aman (1981) found that an advance organizer in combination with the learning activity packet was more effective in decreasing magnitude of error on post test scores than was the learning activity packet alone.

Borer (1981) found that at a high level of selective attention students provided with strategies such as advance organizers and behavioural objectives performed better than students not provided with advance organizers.

Doyle (1981) found that an advance organizer can anchor a formal level, mathematical concept logical reasoning level was a significant correlation of ability to understand the advance organizer, and an advance organizer can help in teaching for transfer.

Eckorlimg (1981) found that the result did not support for an interaction of passage type and an organizer.

Edgar (1981) found a facilitative although non-significant effect of the advance organizer for both
learning disabled and nondisabled students.

Giles (1981) found that one teacher utilizing different mediators of learning can bring about significantly different learning outcomes.

Haghighi (1981) found that both advance organizers and underlined cues facilitated meaningful prose learning.

Johnson (1981) found that there were differentiated effects on the recall of students with low, middle and high comprehension scores by the addition of advance organizers to the reading passage.

Korzenowski (1981) found that when teacher variability was minimised by the use of Computer Assisted Instruction materials, a significant interaction resulted between the cognitive level and the absence or presence of organizers at least as far as the immediate posttest was concerned.

Mcadog (1981) found that advance organizer made no significant difference in achievement.

Moore (1981) found that high prerequisite skills and knowledge, advance organizer students did not score
significantly higher than high prerequisite skills and knowledge non-organizer students.

Rodgers (1981) found that in particular the advance organizer suppressed the positive relationships between esteem and achievement, expectancy for success and achievement, and level of prior knowledge and achievement which were generally found in learning situations.

Borine (1982) found that the 20 word advance organizer at level readers were superior to 200 word and no advance organizer on delayed retention. For the above level readers on delayed retention, there were no facilitative effects among the 200 word, 20 word and no advance organizer readers.

Brune (1982) found that advance organizers facilitated listening comprehension for both learning disabled and non-learning disabled groups in both narrative and expository modes. The non-learning disabled group scored significantly higher than the learning disabled group when advance organizer used.

Change (1982) found Filmic Advance Organizers provided facilitative effect for the regular subject in
acquisition and retention of facts and concept presented in a consumer education film and ability levels did not differentially affect the learning outcomes.

Gonzales (1982) found consistent results with expectations, as subjects in treatment group 'A' (technical instruction + Advance organizers) exceeded test scores of subjects in treatment group 'B' (technical instruction only).

Peleg and Moore (1982) found that oral presentation of Advance organizers had a detrimental effect in learning than traditional method of learning.

Rodman (1982) found that it is possible that organizers have their strongest impact in situations requiring transfer of previously learned material.

Tamthai (1982) found that the advance organizer had no facilitating effect on male students who were either field dependent or field independent. However, the advance organizer did have a facilitating effect on female students who were field independent while it inhibited the science learning of field dependent female students.
Watkins (1982) found that an advance organizer written commentary and an advance organizer written commentary with listening examples as aural reinforcement did not indicate scores higher than baseline averages.

Lenz (1983) found that advance organizers can exert a positive qualitative influence on the learning disabled adolescents.

Mahajan (1983) found a significant interaction between the cognitive level and the absence or presence of organizers.

Nakhdom (1983) found no significance between nationalities and treatment interaction and no significant differences between experimental and control groups across nationalities, however, there were significant differences across nationalities for each treatment.

Noel (1983) found that while students benefit from systematically designed instruction to teach rules, advance organizers incorporated in that instruction do not necessarily enhance learning transfer.

Dennis (1984) found no significant interaction between treatment on the two dependent variables.
Livingston (1984) found that high ability subjects in the advance organizer group achieved significantly higher scores than low ability students.

Nika (1984) found that the experimental group scoring significantly higher on the Genetics Problem Solving Test than the control group with in one school.

Miller (1984) found that the visual organizer group scored significantly better on immediate recall than the control group.

Mides (1984) found that the learning style variables expressed as preferences for environmental emotional, sociological and physical factors donot account for variability in achievement when an advance organizer is employed in the learning of anthropological concepts or suggest reasons for the failure of other research to affirm the efficacy of the Advance organizer.

Scott (1984) found that advance organizer was not superior to the introductory overview in its effect on concept mastery.

Stankiewiez (1984) found that advance organizers consistently promoted better scores with regard to both recall and application type questions.
Cahall (1985) found advance organizers scored significantly higher on the post-test (FL .05).

Clibern (1985) found that experimental group scores on the delayed post-test were significantly higher than those of the control group.

Corbeit (1985) found that continued use of behavioural objectives as effective aids to readers of study units. Because addition of an expository organizers as another pre-instructional strategy promoted some additional cognitive learning, particularly at lower cognitive levels.

Carnes (1985) found that students working on computer tutorials in group of 3 or 4 students attain competency faster than students working alone, while no significant difference in achievement or retention were observed.

Healy (1985) found no evidence to support Ausubel's hypothesis that advance organizers facilitate retention.

Keurer (1985) found no significant difference in the subjects performance with regard to language in terms of overall percentage of recall and summaries, not in the pattern of recall per hierarchal level of idea units.
Morgan (1985) found facilitating effects of advance organizers on both student achievement and student attitudes.

Saidi (1985) found that the visual spoken advance organizer did not significantly influence rule-learning in the computer assisted video instruction (CAVI).

Tennyson (1985) found a positive effect for the inverted-pyramid story over than control story, however, this effect also did not reach to the significance at the .05 level.

Lasky (1986) found that advance organizers were an effective instructional strategy with bilingual learning disabled students.

Little (1986) found that the use of summaries, outlines, key-terms and questions and the use of conventional social studies instruction were effective in improving the social studies achievement of students.

2.3.4. An Overview of Research Studies of Advance Organizer Model

As far as the Advance Organizer Model is
concerned, the researcher arrived at the following conclusions.

The researchers used various forms of Advance organizers, like, Filmic Advance Organizer, Diagram Advance Organizer, Graphic Advance Organizer, Visual Spoken Advance Organizer, Verbal Advance Organizer, Game Advance Organizer, Abstract Advance Organizer, Concret Advance Organizer, Post Advance Organizer, etc. Written Advance Organizer, Comparative Advance Organizer, Expository Advance Organizer etc.

Telfer (1979), Schwartz (1979), Lali (1980), Martin (1980),
Rodgers (1981), Borine (1982), Change (1982), Ganzales
Livingston (1984), Mika (1984), Miller (1984), Stankiewicz
and Lewis (1986), While the research studies of Woodward
(1966), James (1967), Neisworth (1967), Neisworth (1968),
Bauman etc. (1969), Broney (1969), Townsend (1969),
Barron (1971), Ethirveerasingam (1971), Hershman (1971),
Munford (1971), Barnes (1972), Sower etc. (1973), Felker
(1973), Carol (1974), Graber (1975), Saretsky (1975),
Kersten (1976), Travers (1976), Goodman (1977), Parisi
(1977), Salman (1977), Zakkour (1977), Frost (1978),
Geiger (1978), Phelps (1978), Stahlen (1978), Kovehak (1978),
Sylves (1978), Bartel & Heckman (1980), Dena (1980),
(1985), Healey (1985), Meurer (1985), Saidi (1985) and
Tennyson (1985) found insignificant effect of Advance
organizers on active learning, achievement and retention situation.


The effect of advance organizer due to ability level had been found in the research studies of Hershham (1971), Saretsky (1975), Goodman (1977) and Livingston (1984).

The significant interaction/participation level had been found in the research studies of Caponechel (1973), Murchison (1975), Saretsky (1975),

Neisworth (1968), Edgar (1981), Brune (1982), Lenz (1983), and Lasky (1986) found that advance organizers are an effective instructional strategy on achievement of disabled learners.

2.3.5. Implication of Previous Research for the Present Study

From the review of the research studies, it is realised by the researcher that contribution of cognitive style to school learning has been observed in some studies. Studies exploring into the function of analytic-global dimension of cognitive style in learning different subjects seemed to have produced more consistent results than those involving field dependence-independence dimension. This suggested further exploration of conceptual style preference
with regard to its effect on acquisition of concepts. It has been claimed by the exponents of Advance Organizer Model, the studies reviewed did not seem to have indisputably confirmed the effectiveness of this model for learning and retention of concepts. Logical reasoning level and ability have been shown to be important factors affecting learning of concepts by advance organizer treatment. This indicated greater applicability of the model for teaching concepts to formal operational students. Although no researcher has employed full-fledged Bruner model, the studies concentrating on various facets of this model indicated its effectiveness for the teaching of concepts. Further testing of the model for teaching formal operational students seemed warranted.

It is further realized that the problem of teaching concepts through models is still unsolved. The problem has sufficient pedagogical and theoretical importance and hence further attempt to resolve it seemed warranted. Reviewers such as Wittroek (1966), Cronbach (1966), Herman (1969), and Gustafsson (1975) have pointed out a number of
inadequacies in previous research on this issue. Semantic inconsistencies in designating method, unfair treatment to didactic group, methodological weakness and low technical quality are the few to mention. Research evidence in this area is still inconclusive. Since these models had well defined formats, direct comparison between them was expected to be relatively from those impending factors which vitiated previous research in this area. It was also revealed that there has been only one research study directly comparing effectiveness of these two models for the acquisition of mathematical concepts by Chitriv (1983), even though Weil and Joyce (1985) suggested that Advance Organizer Model and Concept Attainment Model are concerned with acquisition and retention of concepts. Research evidence with regard to efficacy of Advance Organizer Model is inconclusive. Travers (1976) concluded that the use of advance organizer did not increase the performance of the student. Present study leads to satisfy this need to some extent.

In India, some efforts have been made to train teachers for using these models in their day to day
teaching. The Department of Education, Devi Ahilya Vishwavidyalya, Indore conducted a series of training programmes in the year 1983, 1985 and 1986 for this purpose. In this context, the researcher felt that these models should be experimented in Indian conditions before they are accepted as a system of teacher education in this country. In the present study, therefore, the researcher studied the different aspects of teaching under these two models in the area of teacher education.