CHAPTER-II

REVIEW OF RELATED STUDIES
CHAPTER-2

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2.0 REVIEW OF RELATED LITERATURE:

Review of related literature provides helpful orientation for definition of the problem, background or research design and comparative data for analysis and interpretation of results. Moreover, familiarity with related work adds quality to each research effort in many respects.

In India, during the last few decades, efforts have been made to study the classroom behaviour of teachers through Flander's Interaction Analysis category system which equips them to change their teaching behaviour so that development in the cognitive and affective domains of pupils can be brought in. Efforts were also made to identify teaching skills for teaching different subjects. Also the Microteaching technique was researched for improving general teaching competence. Later, different strategies of integrating teaching skills were tried out. Another group of researchers tried to find out the teaching patterns which are conducive for developing cognitive and affective behaviour. It is generally agreed that the objectives to be achieved through the teaching-learning process are multidimensional in nature. It is also felt that a particular method or technique may not be appropriate for achieving the multidimensional objectives. This led researcher to explore the use of various methods and techniques in an integrated fashion which resulted in the development of new instructional strategies. The greatest emphasis was on development of
the cognitive domain. All these efforts did little for achieving the all-round development of the personality of the child. In other words, cognitive, affective and psycho-motor behaviour must be developed in a balanced and integrated fashion, 'Models of Teaching' have great potentiality for achieving this goal of education.

2.1 THE RELATED STUDIES COMPLETED ABROAD:

The following related studies have been conducted abroad:-

Smoke (1932)\(^1\) and (1933)\(^2\) has studied the effect of positive and negative type of items on the learning of concepts. Hovland (1952)\(^3\) analysed the concept learning and concluded that the amount of information conveyed by each type of instance under specified condition and the process of assimilating information from two type of instances when the amount of information transmitted is equated should be analysed separately. He also analysed the paper of Smoke (1932 and 1933)\(^4\) and gave his view as the inefficiency of negative instances is due to the difficulty in assimilating information.

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4. Ibid.
presented in terms of what the concept is not? Craig (1956) and Corman (1957) have investigated the effects of varying amounts of guidance given by the teacher in stimulating discovery and Kersh (1958) and (1962) has looked at the motivational effects of discovery methods and Wittrock (1963) has looked at the interaction between the amounts of guidance and direct and transfer learning criteria. Gagne (1965) and (1967) systematized the several steps of learning and learning of concepts came at the sixth place in hierarchy. The careful design of instruction can surely increase its probability and by so doing make the entire process of learning more sure, more

predictable and more efficient. Falk (1971) opines that concepts have various dimensions and in their development one moves along these dimensions i.e. from concrete to abstracts, from vague to clear, from inexact to precise. Selden (1971) made the development of support for generic strategy type differentiation and an empirical study of Concept Attainment behaviour. Sample consisted of 32 sixth graders. It was found that the effect of mode of presentation was significant. Casion (1972), taking a sample of 124 undergraduate students, developed and tested an information processing model of concept learning, incorporating a hypothesis generation mechanism. Montecarlo's stimulation of the concept learning process indicated that the violation of any of these assumptions resulted in the model learning more slowly. Mills (1973) selected high school and college students to study the effect of a proposed model for motivation on the Concept Attainment.

The main findings of the study were: (i) The instructional use of the proposed model for motivation was effective in increasing

concept attainment for the high school population. (ii) The instructional use of the proposed model for motivation made no difference in concept attainment for undergraduate college population. (iii) The proposed model for motivation had a positive effect on the concept Attainment of the students for the graduate college population. Peters (1973)\(^1\) determined whether the Frayer Model of Concept Attainment which encompasses a systematic procedure for defining concepts and structures material in a manner designed to facilitate comprehension for both good and poor readers was superior to a method employed by many social studies text-books in defining concepts. The sample consisted of 360 IXth grade subjects. Multivariate Analysis of Variance showed a significant difference between the good and poor readers who utilized the Frayer Model for good and poor readers who used the text-book approach. Ngoi (1974)\(^2\) validated a model of levels of Concept Attainment to be used in the assessment of elementary school children's attainment of fifteen theoretical concepts within the conceptual scheme of the 'particle nature of the matter'. The sample consisted of sixth graders. The finding showed that there was an assistance of a cumulative hierarchy of the levels of the study and the scaling of these levels appear to be

1· Peters, C.W. Ph.D. (1973) : A Comparison Between the Frayer Model of Concept Attainment and the Text-Book Approach to Concept Attainment. The Univ. of Wiscon Diss. Abs. Int. 34(9), 5599.
different from the order suggested in the model. The order proceeds from Recall, Application to Generalization. Trundnak (1974)\(^1\) investigated the relative effectiveness of four connecting teaching procedures for Attainment and generalization of mathematical concepts. The sample consisted of 124 college students. The findings showed non-significant differences in the treatment groups for Concept Attainment concerning to the model of teaching. Mckeachie and Kulik (1975)\(^2\) found that comparisons with the lecture method on measures of Retention, high level thinking, attitudes and motivation tended to favour the discussion method. Barnes and Clawson (1975)\(^3\) and Faw and Waller (1976)\(^4\) concluded Advance Organizers tend to aid lower ability learners more than higher ability learner. Klausmeier and his associates (1977)\(^5\) have found Concept Attainment in terms of levels.


According to their model of conceptual learning and development, Concept Attainment takes place in an invariant sequence of four levels. Mayer (1979) had found that subject areas where Advance Organizers might be most helpful are Science and Mathematics.

Alexander, Frankkiewicz and Williams (1979) concluded that learners used in these experiments may lack the ideational scaffolding to which potentially meaningful new knowledge could be related, making it possible for them to utilize Advance Organizers. Lawton and Wanska (1979) found that Advance organizer using both the content and the process concept are more effective than Advance Organizer, using either the content or process concepts. Lalli, (1980) reported that Advance organizers had little or no effect on reduction of test anxiety. Lack of Advance Organizers significantly decreased performance on teacher made tests. Webb (1982), Slavin (1983) have

studied the cooperative learning method. Another approach to instruction is the individual instruction which includes the mastery learning. Noel (1983)\(^1\) found while students benefit from systematically designed instruction to teach rules, Advance Organizers incorporated in that instruction do not necessarily enhance learning transfer. Stone (1983)\(^2\) found that using advance organizers to introduce new material to be learned does facilitate long term retention. Lee (1983)\(^3\) studied the interactive effects of the personal traits of conceptual development and the different types of presentation of the Concept Attainment. The sample consisted of 511 male and female Xth grade students. A 2x2 Factorial Design was used to conduct the research. It was found that there was a statistically significant difference between instruction based on definitions and examples and based on examples only. Awodi (1984)\(^4\) compared achievement in Biology by Nigerian secondary school students (Xth) when taught either by the Inquiry method or by the Traditional (Lecture) method. A Teacher training package based upon Biology Teacher’s Handbook

(2nd Ed. 1970) was developed by Awodi and used to train Inquiry Group teachers during a workshop. Results showed that students in the Inquiry group attained significantly higher level of achievement than did students in the Traditional group. Hur (1984)\(^1\) conducted a study to develop a comprehensive instrument for evaluating Inquiry Teaching Approaches embedded in science curricular materials. The first part of the instruments consists of different processes grouped into four sections. Dalton (1986)\(^2\) studied about the teachers thinking processes as they attempted to implement of teaching two recently acquired models (CAM and Synectics) in their classroom and to investigate the relationship of processes to their success in transferring the new models of teaching to their active teaching repertoire. The sample consisted of ten teachers with no previous experience with either Concept Attainment teaching strategy or the Synectic strategy, two teachers with three years of experience in using both strategies. A semi structured simulated recall interview were used. He found that teachers using these two strategies report nearly twice as many thought related


to both goals/objectives and instructional procedures. Faraj (1986)\(^1\) attempted to investigate whether using the inquiry method in teaching science in elementary schools in state of Kuwait is better than using the existing traditional method. The researcher worked with four teachers in two different schools as well as 112 students in four classes. The research design were planned as two classes were taught by two teachers using the inquiry method while the other two classes were taught by other two teachers using the traditional method. During the teaching period of a unit about 'Magnet' which completed in thirteen lessons, with each lesson having a duration of 45 minutes, the researcher observed the students in order to count the number of times they were involved in each of five essential science experience which are Observation, Measurement, Experimentation, Interpretation of data and Prediction.

When the teachers finished teaching the unit, the researcher gave a uniform example to all of the students. Analysis of data at .05 level of significance revealed that there was a significant statistical difference in favour of that learned by the Inquiry method in the number of times the students were involved in each of five essential science experiences. Also on the final test, the means of the scores of the students who learned by the Inquiry method were higher than the means of the scores of the students who learned by the traditional method.

Young (1987) evaluated the effectiveness of an instructional model derived from the research on learning styles, science curriculum development and development of thinking skills. The model implied that a specific sequence of instructional strategies which included a discrepant event discussion experimentation, practice and application would result in significantly higher achievement among students of all learning style preferences compared to traditional science instruction relying primarily on text-book and lecture. VIIth grade students were randomly assigned to one of two treatments for a total of 24 weeks. No significant interactions were found main effects of learning style and gender were not statistically significant. The main effect of treatment was statistically significant, affecting a linear combination of dependent variable composed of C.T.B.S. ‘verbal originality’ and Figural Elaboration. The researcher concluded that using a variety of instructional strategies in a pre-planned sequence of basic thinking skills, verbal creativity thinking.

Writ (1987) investigated the relative effectiveness of a laboratory oriented inquiry based chemistry course, that included additional training in 'Logical thinking', 'skill, versus traditional lecture chemistry course. Both groups were Pre-tested and Post-tested using the cooperative science test, Chemistry, form A for achievement and the English version of the Longeot Test for Cognitive Intelligence. The same test booklets and the same subject matter were covered in all cases. Chi-square analysis showed significant difference in the predicted direction for the use of Inquiry in the activities of the teacher and the students and in the teacher's position in the classroom.

2.2 THE RELATED STUDIES CONDUCTED IN INDIA:

Debnath (1971) studied the teaching efficiency; its measurement and some determinants. Teaching efficiency depends upon the knowledge of the subject matter, mastery of method of teaching academic qualifications, Sharma (1972) tried to find out the effects of different teaching patterns on cognitive attainment of pupils. He found that the narrow questioning technique was more effective than other teaching patterns in attaining the knowledge and

comprehension. Raijiwala (1976) used FIACS and studied the changing behaviour of teachers during science teaching and its effect on pupil achievement. The findings state that the training in FIACS modifies the teacher behaviour and training along with the feedback given to the teachers affected the academic achievement of the pupils in science positively and significantly. Chakraborty (1978) studied the strategies of classroom teaching and she found that lecturing and Questioning-Answering by using behavioural and objectives is more effective than Lecturing and Question - Answering for knowledge, comprehension, Application and total achievement. Pandey (1981) studied the effect of teaching style on the Concept Attainment in science teaching on a sample of 300 secondary school students. The main findings were: Lecturing was negatively related with different levels of Concept Attainment and the segment of formal level, excepting for segments of problems and definitions with which it was positively correlated. The teacher's questioning had significant positive effect on both the levels of Concept Attainment. Empathic style was slightly superior to the democratic style whereas both of these styles

were superior to Oratorial and Traditional styles. Chitrive (1983) worked on the comparative effectiveness of Bruner strategy and Ausubel strategy with traditional strategy on the various criteria of Concept acquisition in Mathematics; relative effectiveness of Ausubel and Bruner strategies on the various criteria of Concept acquisition in Mathematics. Sample consisted of 127 XIth grade students of science. He concluded that both Ausubel's and Bruner's strategy were superior to traditional strategy for teaching mathematical concept to eleventh grade students, so far as knowledge transfer and heuristic transfer of the concept were concerned, Bruner's strategy was superior in short term retention and long term retention of the concepts. The strategies of Ausubel and Bruner were equally effective in respect to student's ability to acquire knowledge of mathematical concept. As related to concept transfer Ausubel's strategy was superior to Bruner's strategy whereas, Bruner's strategy was superior to ausubel's strategy in students ability to heuristic transfer conceptual style preference have differential effect on their acquisition of mathematical concept, when taught by Ausubel's strategy, this strategy appear to be more suitable for teaching mathematical concepts to categorical style which did not seem to have differential effect when taught by Bruner's strategy.

Bhattacharya (1984) studies the effectiveness of various models for teaching geography in relation to instructional resources. The main findings of the study were - (i) In the high resource status educational institution, C.A.M. group of students do not differ significantly from the Traditional technique group in terms of their mean gain achievement in geography, (ii) Concept Attainment Model is significantly better than traditional model in terms of mean gain achievement scores of the student in a very low resource status educational institutions, (iii) Inductive Model of teaching has emerged to be the best model for teaching geographical concept in all type of resource status educational institution in terms of gain achievement scores of students, (iv) The models under investigation may be ranked as : Inductive first, Concept Attainment Model is second and third is Traditional Model of Teaching (iv), High resource status educational institutions shows significantly better academic achievement in geography irrespective of Models of teaching and the types of concept taught in comparison to the low resource status educational institute (vi) Concepts related to physical geography are significantly better learnt in comparison to the concepts related to non-physical i.e. human and economic geography irrespective of the resource status and model of teaching. Passi, Singh and Sansanwal (1985) studied the

effectiveness of training in Concept Attainment Model in terms of understanding of, and reaction towards the model; the effectiveness of training in Inquiry Training Model in terms of understanding and reaction towards the model; The resultant willingness of teacher educators to implement the models in teacher education programme. The objectives of the studies were - (i) to study the efficacy of different variations in training strategy adopted for training in Models of Teaching in terms of performance on: (a) Theory checkup (b) Teaching Assessment Guide (c) Reaction Scale.

2. To study the feasibility of integrating training in Models of teaching in practice teaching programme and school teaching in terms of willingness of teacher educator as Student-Teachers and pupils reactions. 24 Student-Teachers of B.Ed. course (1985-86) were selected for the experiment. Experimental method of research was used. Pre-Test, Post-Test, control group design were adopted. The sample divided into two groups: (i) Experimental (E1), (ii) Experimental (E2). The two groups were matched on academic qualification and method subjects offered by the Student-Teachers in the B.Ed. course (1985-86). The different tools were used either for Concept Attainment Model or Inquiry Training Model as required in research design. The main findings of the study were that training in both of the models, Concept Attainment and Inquiry Training in the form of lecture, demonstration, discussion, and peer-practice-feedback.
did enhance the understanding of teacher-educator’s theoretical aspects of Concept Attainment Model, the training in concept Attainment Model did bring significant favourable change in teacher educator’s reaction towards Concept Attainment Model and Inquiry Training Model. The level of understanding of C.A.M. and I.T.M. did not influence teacher-educator’s willingness to implement model of teaching in teacher education programme. The training strategy comprising of theoretical discussion, demonstration and Peer practice feedback in quadro was effective in terms of developing understanding and favourable reactions and willingness to implement models of teaching in teacher training programme. Das (1986)¹ studied the effectiveness of Concept Attainment Model in terms of teaching competencies in pre-service Student-Teachers, the effectiveness of Concept Attainment Model in terms of training the model, understanding the model, reactions towards the model and the effectiveness of Concept Attainment Model in relation to achievement, sample consisted of 16 Students-Teachers of D.A.V. Indore. The main findings of the study were that Concept attainment Model is effective in developing the teaching competencies of pre-service Student-Teachers. The orientation given to Student-Teachers in theoretical aspects of

Concept Attainment Model, training in C.A.M. had affected the teaching behaviour of Student-Teachers at coaching stage. There was significant change in the student-teacher's Attitude towards the Concept Attainment Model at Post-theory demonstration and Post-Practice stage. There was effective transfer of training and concept Attainment Model had affected the teaching behaviour of Student-Teachers at coaching stage. There was no significant relation between previous academic achievement of Student-Teachers and their performance on concept attainment Model (CA.M.) theory.

Bihari (1986)\(^1\) studied the effectiveness of three training strategies in learning C.A.M. in terms of teaching competence of Student-Teachers, in terms of understanding of the model; in terms of coaching through the model; in terms of willingness to implement of the model, the sample consisted of 55 Student-Teachers of D.A.V. Indore. The main findings of the study were the three training strategies namely peer-practice-feedback in quadro, Peer practice feedback in pairs and demonstration followed by practice in quadro were equally effective for developing teaching competence.

Pandey (1986) studied the effectiveness of Advance Organizer Model and Inquiry Training Model and Inquiry Training Models for teaching social studies in VIIIth class students. The objectives of the study were (i) to compare the effect of Advance Organizer Model, Inquiry Training Model and conventional teaching in terms of pupil's achievement in social studies, (ii) To compare the effect of Advance Organizer Model, Inquiry Training Model and Conventional Teaching in terms of pupil's attitude towards social studies. (iii) To study the pupil's reactions towards Advance Organizer Model and Inquiry Training Model. Experimental method of research was used. Three groups two experimental and one control were formed in this study. The groups were matched on student's intelligence and socio-economic status scores. One experimental group was taught through A.O.M. while the other through I.T.M. The control group was taught through conventional method. Pre-Test, Post-Test, Control group design were employed. The sampling technique used in this study is purposive. The purposive sample is selected by some arbitrary method important for the particular study. 86 male students constituted the sample of the study A.O.M. group and I.T.M. group consisted of 29 and 28 students respectively while the control group consisted of 29 students.

analysis of variance was applied to see the significance of difference among the means of gain achievement and attitude scores of students towards social studies in the three groups. For significant F-ratio, t-test was used taking two treatments together. The main findings of the study were - (i) Advance Organizer Model was found to be more effective in terms of pupil's achievement in social studies than the conventional teaching (ii) Inquiry Training Model was found to be more effective in terms of pupil's achievement in social studies in comparison to conventional teaching to VIII class students, (iii) He did not find any significant difference between the social science achievement scores of the groups of the student taught through Inquiry Training Model and Advance organizer Model. (iv) No significant difference among the means of gain score of pupil's attitude towards social studies taught through Advance Organizer Model, Inquiry Training Model and Conventional Teaching were found. (v) Pupils reacted favourably towards Advance Organizer Model as most of the Chi-square values to items were significant either on .05 or .01 level and majority of the pupil's responses fell under agreed category for positive items and disagreed category for negative items. (vi) Pupils reacted favourably towards Inquiry Training Model as most of the Chi-square values to items were significant either at .05 or .01 level and majority of the pupil's responses fell under agreed category for positive items and disagreed category for negative items.
Sharma (1986)\textsuperscript{1} studied the effectiveness of concept Attainment Model in terms of achievement of students on attainment test based on the concepts taught in chemistry and the effectiveness of Concept Attainment Model in terms of reactions of students towards the new method of Teaching. The sample consisted of 67 students of class IX. She found that the mean performance of the experimental and control group on achievement test is not significantly different from each other. Students of experimental group have responded favourably towards majority of the statements. Budhisagar (1987)\textsuperscript{2} found that Advance Organizer Model and Operant Conditioning Model were significantly superior to the traditional method in terms of achievement of B.Ed. students in educational psychology. Gangrade (1987)\textsuperscript{3} compared the achievement of class VIII students taught through combination of Concept Attainment Model and Lecture Method (LM) with those taught through Traditional Method (TM) by taking separately Intelligence, attitudes towards science and previous year

\textsuperscript{2} Budhisagar, M. (1987): Development and comparison of Instructional materials Developed by using Advance Organizer Model and Operant Conditioning Model for Teaching Educational Psychology to B.Ed. students, Ph.D. Edu., D.A.V.
achievement in science as covariates. The sample consists of 104 VII and VIII class students of science. She found that combination of Concept Attainment Model with lecture method was significantly superior to traditional method in teaching Chemistry to class VII students. The combination of Concept Attainment Model with lecture method was significantly superior to Traditional method in teaching physics to class VIII students. For predicting the achievement in science of class VIII students taught chemistry through combination of Concept Attainment Model and Lecture method, Regression Analysis was done. The intelligence was found to be contributing to the extent of 53% to the achievement in science. For predicting the achievement in science of class VIII students taught physics through combination of Concept Attainment model with Lecture method, regression equation was evolved. The total contribution of intelligence, attitude towards science, achievement value, anxiety and previous year achievement in science was 74% out of which intelligence contributed to the extent of 42% and attitude towards science to the extent of 25.8%. Sushma (1987)\(^1\) had studied the effectiveness of Concept Attainment Model and Biological Science Inquiry Model for teaching Biological Sciences to VIIth class students. The main objectives of the study were as - (i) To study the effect of Concept Attainment Model based teaching on pupil’s achievement. (ii) To study the effect of Biological Science

Inquiry Model based teaching on pupil’s achievement. (iii) To compare the effectiveness of Concept Attainment, Biological Science Inquiry Model and Traditional teaching approach to teaching on pupils achievement, (iv) To study the differences in attitude change towards Biological Science when taught through different models of teaching (C.A.M. and B.I.T.M.). Purposive sampling was done for the study. For the purposive sampling Central Hindu Girl’s School of Varanasi was selected. Experimental method of research was used. Pre-test, Post-test, Control Group Design were adopted. The sample was divided into three groups. Each group has 26 pupils. Analysis of variance was applied to see the significance of difference among the means of gain achievement and attitude scores of students towards Biological Science in three groups. The main findings of the study were - (i) Concept Attainment Model was found to be more effective in terms of pupil’s achievement in Biological Sciences than the B.S.I.M. whereas B.S.I.M. was more effective to Conventional Teaching method. (ii) There was no significant difference among the means of Pre-test and Post-test attitudes scores of pupils taught through either C.A.M. group or B.S.I.M. (iii) Concept Attainment Model had more favourable attitude than the Biological Science Inquiry Model (B.S.I.M.), when taught through both model. Kumar (1992) studied the effect of teaching models on Concept Attainment and relationship

of cognitive development with Concept Attainment in Science of IXth grade.

The objectives of the study were - (i) To study the effect of teaching models on Concept Attainment in Science of Ninth grade students, (ii) To study the relationship of Cognitive development with Concept Attainment in Science of IXth grade, (iii) To compare the Concept Attainment in Science of IXth students at concrete and formal operational stages of Cognitive development, (iv) To study the interaction effect of Teaching models and Cognitive development in Science of IXth students. The sample consisted of 332 male and female students of IXth grade enrolled in different High Schools. The main findings of the study were: The majority of IXth grade students (78.012%) are functioning at concrete-operational level. Only 21.988% students have exhibited formal-operational thinking. The Concept Attainment model was most effective among all three teaching model (i.e., C.A.M., I.T.M. and Traditional teaching method). The Traditional teaching method was least effective in this regard. Singh (1995) studied the classroom behaviour training of Student-Teachers through F.I.A.C.S. and its effect on pupil's achievement and their attitudes. The objectives of the study were: (i) To study the effect of training of Student-Teachers through F.I.A.C.S. vis-a-vis Traditional method on

classroom teaching competence, (ii) To find out the difference in mean gain scores on Attitude Scale of Student-Teachers trained through F.I.A.C.S. and Traditional method, (iii) To study the difference in the attitude (reaction) of pupils taught by Student-Teachers trained through F.I.A.C.S. and the attitude of pupils taught by Student-Teachers who have been trained through traditional method, (iv) To study the effectiveness of training of Student-Teachers in F.I.A.C.S. vis-a-vis traditional method as a means of improving pupil’s achievement. The experimental method was employed to conduct the research. An experimental Pre-test, Post-test design with experimental group and control group was executed. The experimental group and control included 16 Student-Teachers each. The groups were matched on variables of age, sex, socio-economic status subjects at graduate level, method subjects etc. To carry out the investigation following tools were used : (i) F.I.A.C.S. as a training tool, (ii) Teaching Assessment Battery (T.A.B.), (iii) Teacher Attitude Inventory (T.A.I.) prepared by S.P. Ahuluvalia, (iv) An achievement test (self prepared) and (v) A reaction scale for teaching (self-prepared). The main findings of the study were : (i) The student teachers of the experimental group gain more teaching competence due to training through F.I.A.C.S. in comparison to those of the control group have been trained through traditional method of teaching, (ii) The Student-Teachers of experimental group gain more favourable attitude due to training through F.I.A.C.S. in comparison to those of the control group who have been trained through traditional method of teaching, (iii) The pupils who were taught by experimental group show more favourable
attitude towards teaching in comparison to the pupils who were taught by control group, (iv) The pupils under the charge of experimental group of Student-Teachers achieve higher score on an Achievement Test in comparison to the pupils who were kept under the charge of control group.

2.3 THE NEED AND SCOPE OF PRESENT INVESTIGATION:

So far teaching has been done through common sense and individualistic approach. A teacher decides how to teach a subject on the basis of his student's days experiences with certain modifications, to suit his personality and level of knowledge. Teaching was mostly decided by the way teacher himself teach the subject. There has been on increasing interest in teaching after a substantial storehouse of models of teaching that directly facilitate the learning of both content and intellectual process has been codified by Joyce and Weil (1980)\(^1\). They stated that it is always needed to add to the existing store house to create programmes that will develop many of the most powerful ways of teaching that have been promised. These 'models of teaching' result in more effective teaching of basic school subjects, both at elementary and secondary levels, than the methods generally employed to teach them.

According to Gage (1963) ¹, "Teaching is a complex process and so research on teaching needs many sided preparation. Under these circumstances, it is essential in the field of teaching to identify or select effective teaching models for different subjects. Researches in this area have been quoted by Awodi (1984) ², Hur (1984)³, Faraj (1986)⁴, but these studies are not sufficient for conclusive results for all country and times. In India, researches on various aspects of teaching has been done (Buch 1991)⁵. These were by Chitriv, Passi, Singh and Sansanwal, Ghosh, Pandey, Budhisagar, Sushma, and Baveja (1988)⁶.

From the review of research studies, it is very difficult to draw any conclusive result about the models of teaching as they have not been investigated properly. In this context, N.C.E.R.T. have made a good attempt and organised a workshop for the implementation of ‘Models of Teaching’ in teachers training programme. It had already been felt by the investigator that the models of teaching should be tested prior to they should be recommended to student teachers for training purposes.

The prevalent teaching strategies or methods are proving to be less feasible and effective in accomplishing specific instructional goals. ‘Models of Teaching’ given by Joyce and Weil seems to be suitable for the teaching of all school subjects as they emphasise on both content and process of teaching. The investigator, from the study of related literature has found that the effectiveness of Concept Attainment Model (C.A.M.) and Advance Organizer Model (A.O.M) in respect of student’s Achievement and their Attitude towards teaching science subjects is totally left untouched and thus he has taken the present study as an humble endeavour in this regard.

2.4 THE PROBLEM:

The present study has been specifically entitled as:

“A comparative study of effectiveness of ‘Concept Attainment Model (C.A.M.)’ and ‘Advance Organizer Model (A.O.M.)’ in respect of Student’s Achievement and their Attitudes.”

Before identifying the objectives of the study, it seemed prudent to define the variables under study in operational terms: The variables and their meanings have been given as under:

2.5 THE VARIABLES AND THEIR MEANINGS:

(A) Independent Variables:

In present study, the following training strategies are considered as independent variables -

(i) Concept Attainment Model
(ii) Advance Organizer Model
(i) **The Concept Attainment Model (C.A.M.)**

The Concept Attainment Model (C.A.M.) was developed from the work of Jerome Bruner, Jacqueline Goodnow and George Austin. This model helps students to develop and form new concepts, with the help of teacher and students analyse their strategies of thinking.

(ii) **Advance Organizer Model**

Advance Organizer Model was developed by David Ausubel. This model helps students to increase efficiency of information processing capacities meaningfully and relate bodies of knowledge. In this model, there is interaction between students and teacher.

(B) **Dependent Variables**

The following variables were treated as dependent variables:

(i) **Effectiveness**

It refers to the effect of particular treatment given to a subjects which produces a significant change in student’s academic achievement or behaviour. This change has been observed in terms of student’s achievement and attitude towards chemistry.

(ii) **Student’s Achievement**

The groups of Student-Teachers trained through Concept Attainment Model (C.A.M.) and Advance Organizer Model (A.O.M.) teach two different groups of pupils. The students under the charge of experimental group I and Experimental
group-II is supposed to have difference Achievement scores in the subject. The difference between the post and pre-test scores has been taken as gain achievement scores.

Hence, the gain achievement scores of the students has been taken as a dependent variable (criterion variable).

(iii) **Student’s Attitude (Reaction of Students):**

The Attitudes of student’s under the charge of Experimental Group-I and Experimental Group-II are taken as dependent variables. The Student-Teachers trained through, ‘Concept Attainment Model’ and ‘Advance Organizer Model’ is expected to differ in their teaching methods which, in fact, makes an impact on Attitude/Reaction of their students towards different teaching strategies.

Hence, the difference (change) of Pre and Post-test scores on Attitude scale was considered as next criterion variable.

2.6 **ASSUMPTIONS UNDERLYING THE STUDY :**

1. Concept Attainment Model and Advance Organizer Model stand as the representative of inductive and expository methods.

2. Teachers can be programmed to teach according to these models.

3. Relative effectiveness of these models can be judged in terms of pupil’s achievement and attitude towards the teaching of a subject.
4. Teacher behaviours are only partially controlled by student’s responses and to a large extent by the method adopted.

5. There is no one best method to teach.

2.7 OBJECTIVES OF THE STUDY:

The objectives of the present study may be presented as follows:

1. To study the effect of Concept Attainment Model on the Opinion (Reaction) of Student-Teachers.

2. To study the effect of Concept Attainment Model on Student-Teachers in respect of their Teaching Effectiveness.

3. To study the effect of Advance Organizer Model on the Opinion (Reaction) of Student-Teachers.

4. To study the effect of Advance Organizer Model on Student-Teachers in respect of their Teaching Effectiveness.

5. To study the effectiveness of training of Student-Teachers in Concept Attainment Model (C.A.M.) vis-a-vis Advance Organizer Model (A.O.M.) as a means of improving pupil’s Achievement.

6. To study the effectiveness of training of Student-Teachers in Concept Attainment Model (C.A.M.) vis-a-vis Advance Organizer Model (A.O.M.) as a means of changing pupil’s Attitude towards Models.
2.8 HYPOTHESES:

In order to fulfill the objectives of the study following null hypotheses have been formulated:

1. The Student-Teachers trained through Concept Attainment Model do not change their Opinion (Reaction) towards the model as measured through concerning Reaction Scale.

2. Student-Teachers, trained through Concept Attainment Model (C.A.M.) do not improve their teaching effectiveness as measured through Teacher Rating Scale (T.R.S.)

3. The Student-Teachers trained through Advance Organizer Model do not change their Opinion (Reaction) towards the model as measured through concerning Reaction Scale.

4. Student-Teachers, trained through Advance Organizer Model do not improve their teaching effectiveness as measured through Teacher Rating Scale (T.R.S.).

5. There is no significant difference between pupil’s Achievement under the charge of Student-Teachers trained through Concept Attainment Model (C.A.M.) and pupil’s Achievement under the charge of student-teachers trained by Advance Organizer Model.

6. There is no significant difference in the Attitude of pupils taught by Student-Teachers trained in Concept Attainment Model (C.A.M.) and the Attitudes of pupils taught by Student-Teachers trained by Advance organizer Model (A.O.M.).
2.9 DELIMITATION OF THE STUDY:

The study was confined to a small sample comprising only 16 Student-Teachers drawn from the entire trainees enrolled in the B.Ed. class (Session 2001-2002) of T.D. Training College, Jaunpur.

The present study involves only the Student-Teachers who had offered the science as one of their teaching subjects. The research could have been done taking the Student-Teachers who had offered other teaching subjects also. But due to paucity of time and non-availability of suitable sample, it was not possible for the researcher to carry out his research work on adequate sample. It was necessary to match the sample of Experimental Group I and Experimental Group II on most of the variable who may affect the criterion variables. But this also could not be done.

Training through Teaching Models (C.A.M. and A.O.M.) involves the careful practice followed by proper feed-back. It involves the supervision of Student-Teacher’s during peer practice feed-back session, which was also a difficult task for the researcher.