CHAPTER – I

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1.1.0 Introduction

Education is the most important invention of mankind, it begins at birth and end at his death. It is a process of growth in which the individual is helped to develop his talents, power, interests and ambitions. This growth is an integrated and harmonious process. Education should aim at developing the innate potentiality and unique individuality of each child according to his nature therefore learning experience every attempt is made at all levels of education to match with the capability of the learner and for that suitable curriculum are framed.

Education in a narrow sense is the modification of behaviour of children in a controlled environment. To shape the behaviour or to bring about some change it is necessary to study the teaching process. Teaching is an activity which is designed and performed for multiple objectives in terms of changes in pupil behaviours.

Teaching is often though of as something that comes rather naturally to people who comes rather naturally to people who know their subject. In general, it is thought that is a simple process that produces simple outcomes. But teaching is an entering important and complex process. It takes place in a complicated serial institution, which is filled with diverse people. It is a fluid interplay of events.

According to PINSENT - "Teaching is a practical art and every good teacher is both artist and craftsman".

According to **PANTON** - "teaching has been referred to as an art".

In its wider sense, teaching is a process by which an individual us taught through his life by his family, school, friendship, recreation and vocation to adapt himself to his environment. Teaching is a tri-polar process which establishes a relationship between the teacher, the child and the subject. The teacher has to have a sound knowledge of himself, so that he may understand his oven feedings and his own behaviour to his children.

The child at birth is born with certain biological inheritance. Biological heredity alone is not enough to enable him to develop harmoniously in a social culture. To equip him with necessary skills and information, concepts and attitudes, and to enable him to adjust properly in his environment, society has created a separate agency school where he can develop all the equalities and abilities required for successful social adjustment. Education has been defined in different ways according to the social needs of the society. Education is in a way development of desirable habits, skill and attitudes which make an individual a good citizen. Briefly we can define education as shaping of behaviour or modification of behaviour of the individual for adequate adjustment in the society.

School is the most important and biggest source of education for country. The most effective part schooling process is classroom teaching. Teaching us an activity, which is designed and performed for multiple objectives, in terms of changes in pupil behaviour, pupils have multidimensional personalities having different learning styles. The common

implication of both there facts is that the teachers should use different strategies of teaching matching the objectives of teaching and pupils learning styles and personalities dimension.

BRUNER also emphasized four major features of theory of instruction in effective teaching.

- Predisposition towards learning.
- Structured body of knowledge.
- Sequences of material to be learnt
- 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 learnt, with improving rather than describing learning.

According to GARLIC "Teaching devices are the teacher's tools and if good work is to be produced the right tools must be used in the right way".

1.2.0 Teaching Strategies

The Collins English Gem Dictionary (1968) defines 'strategy' as "art of war". Although, this term has been popular in relation to war and battle, yet during the last few decades social scientist have started using it in the fields of social planning, teaching and human dynamics.

Let us take the meaning of 'strategy' as applied to teaching.

According to **B. OTHANEL SMITH** : "the term strategy refers to pattern of acts that serves to attain certain outcomes and to guard against certain others".

E. STONES and **S. MORRIES** have defined the term 'teaching strategy' comprehensively in the following manner: -

Teaching strategy is a generalized plan for a lesson which includes structure, desired learner behaviour in terms of goals of instruction and an outline of planned tactics necessary to implement the strategy. The lesson strategy is a part of a target development scheme of the curriculum.

This meaning of teaching strategy involves two aspects :

1) A generalized plan for the presentation of a lesson and

2) It includes desired learner behaviour in terms of goals of instruction.

The perennial quest for effective methods of teaching has attracted the attention of many a probing mind since a long time. Dating back from Plato's "Nieno" which exemplifies the debate about teaching problems and takes up the Socratic technique of teaching, this quest has come a long way to current strategies of teaching. These strategies of teaching derive largely from behaviouristic, cognitive and humoristic perspectives.

A teaching situation necessarily involves the teacher, learner and teaching - learning environment. **MITZEL**(1960) was the first to suggest that research on teaching involved presage, process and product variables, when viewed in the total perspective of teaching - learning situations, the following conceptualisation emerges :

Presage	Process	Product
Teaching behaviour	Teaching Strategy	Learning Outcomes
Learner Characteristics	Objectives	Knowledge
Teaching learning condition	Approaches / phases - Content material	- Skills - Attitudes

The type of Teaching Strategy :

1. Model based teaching strategies
2. Other teaching Strategies i.e. lecture, demonstration etc.

1.2.1 Model based teaching Strategies

The model based teaching in one such innovative concept. The need of its application Indian conditions has been realised by many eminent educationist and effort are being made in this direction in various universities and research organisation all over India.

To achieve three domains, these are cognitive, affective and psychomotor model based teaching is very suitable. A number of educationists and psychologists suggest model based teaching to achieve above goals.

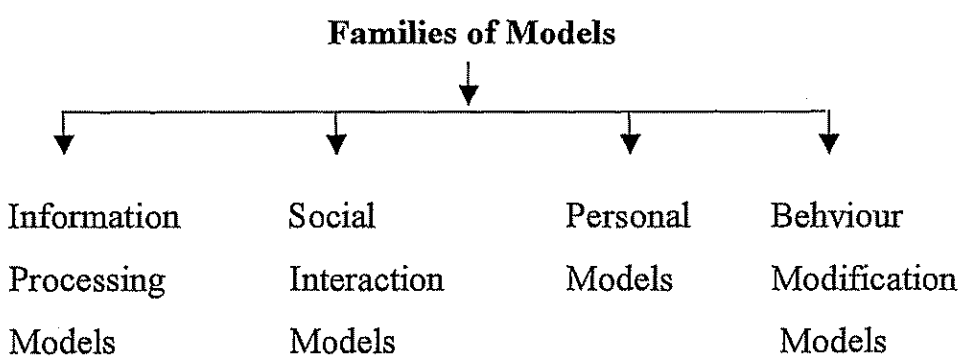
1.3.0 Models of Teaching

The content of each subject and the method used in teaching subject this have been subjected to critical appraisal and as consequence various changes are appearing. The reason being that education is never static and it is always better to look for new trends.

With the introduction of new pattern of curriculum in almost all states many old units of syllabus have been replaced, modified and redesigned by new upgraded content units. The new syllabus has made it possible to go much further in systematizing and explaining the facts.

"How then to teach science at this stage for effective learning"? One way of effectively transacting the content could be the use of models of teaching.

Model based teaching was propagated by a number of educationists and psychologists due to its sheer merit of attaining behavioural objectives - cognitive, affective and psychomotor. More than twenty models has been developed so far. They have been orgnaized into the following families :



1.3.1 The information Processing Models

Information processing models share an orientation towards the information processing they can improve and ways throught whcih they can improve their ability to master information. They are concerned with how people handle external stimuli, organize data, sense problems, generate concepts and finalise solution to problems. Some of the major models are :

1. Taba's Inductive Thinking Model.
2. School's Scientific Inquiry Model.
3. Bruner's Concept Attainment Model.
4. Scuhman's Inquiry Training Model.
5. Ausubel's Advance Organizer.
6. The Piaget's Cognitive Growth Model.
7. The Memory Model of Lucas.

1.4.0 The Concept Attainment Model

as Concept attainment model has emerged from the work of Bruner, Goodnow and Austin (1967). Concept teaching provides a chance to analyse the students, thinking process and to help them to develop more effective strategies.

1.4.1 Meaning of the Concept

Tennyson and Park (1980), to be a set of specific objects, symbols or events, which share common characteristics (critical attribute) and can be referenced by a particular name or symbol.

A concept may be defined as a mechanism enhancing a person to categories objectives or events (Anglin 1977).

Concepts are basic elements of thought. A concept is not observable. It can not be an observable stimulus or a set of object, or an observable response. A concept is an obstruction, which gives a concept its great utility in measurement so difficult.

1.4.2 Concept Formation

Concept formation is the act by which new categories are formed. It is the first step towards concept attainment. It is an act of inversion. In this process, the child learns to discriminate and recognize the things he encounters in his environment.

1.4.3 Concept Attainment

According to Bruner (1967) the act of 'concept formation' and the act of 'concept attainment are two components of the same activity of categorizing, but distinction between them is important because :-

1. The purpose and emphasis of these two forms of categorizing behaviour are different.

2. The step of the two thinking process are not the same and

3. The two mental processes require different teaching procedures. What is common to both the processes is their reliance on the same interpretation of the nature of concept.

1.4.4 Elements of Concept

According to Bruner (1967) a concept has the following five elements:

1. **Name :** It is the term given to category. Although, the items commonly grouped together in a single category may differ from one another in certain respect.

2. **Examples :** They refer to instances of the concept. There are some positive and negative examples. Positive examples are the instances of the concept.

3. **Attributes :** The refer to the characteristics of a particular concept, that distinguish instances of the concept from non-instances.

4. **Attribute Value :** It regfers to the acceptable range for any given relevant attribute.

5. **Rules :** it is the definition or statement specifying the essential attributes of a concept. A rule normally evolves at the end of the concept attainment process.

1.4.5 Syntax

The syntax of the model describes to model in action. It describes the sequences of activities, called phases.

(a) Syntax of Selection Model :

Phase-I : Presentation of data and identification concept / attributes -

1) Teacher presents unlabelled examples.
2) Students enquire which examples including their own, are positive ones.
3) Students,generate and test hypotheses.
4) Name the concept.
5) State its essential attributes.

Phase-II : Testing attainment of the concept

1) Students identify additional unlabeled examples.
2) Students generate examples.
3) Teacher confirms hypothesis names concept, restates definition according to essential attributes.

Phase-III : Analysis of thinking strategy

1) Students describe thoughts.
2) Students discuss role of hypothesis and attributes.
3) Students discuss type and number of hypotheses.
4) Evaluate strategies.

(b) Syntax of Reception Model

Phase - One : Presentation of data and identification of concept.

- Teacher presents labeled examples.
- Students compare attributes in positive and negative examples.
- Students generate and test hypothesis.
- Students states a definition according to the essential attributes.

Phase-Two : Testing attainment of the concept

- Students identify additional unlabeled examples as yes or no.
- Teacher confirms hypothesis, names concept and restates definitions according to essential attributes.
- Students generate examples

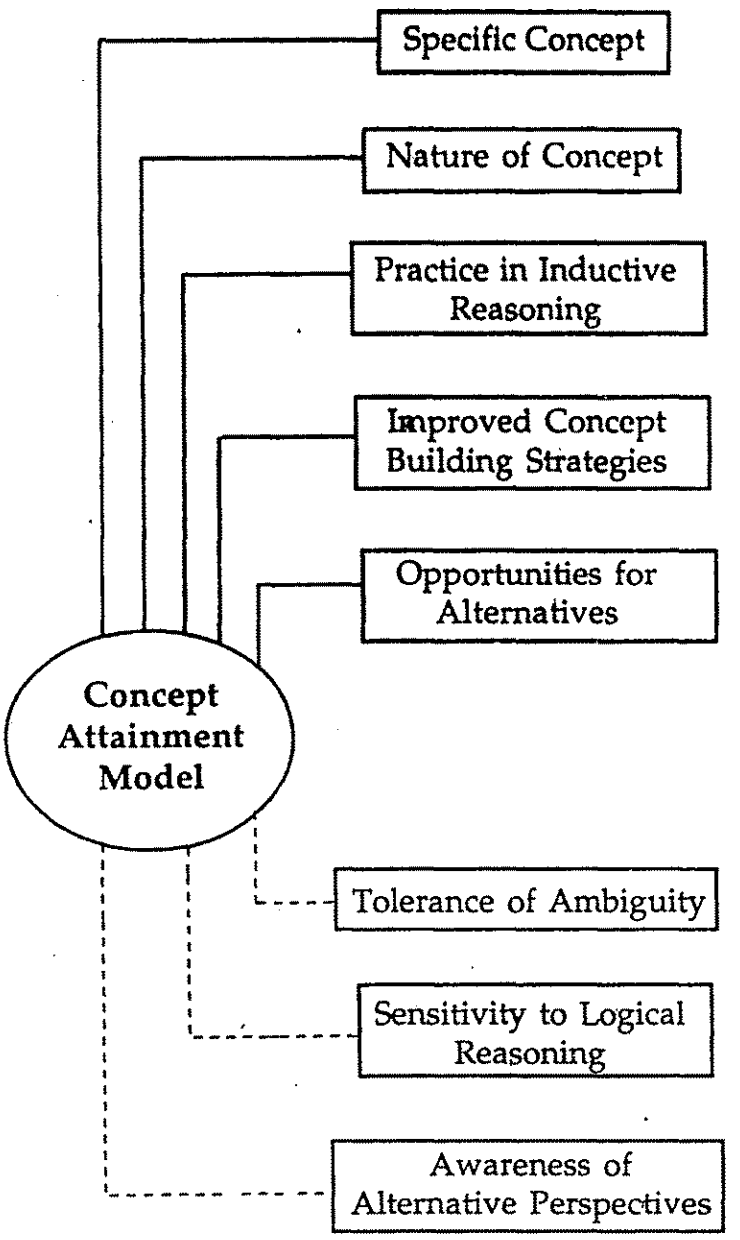
Phase-Three : Analysis of thinking strategies

- Students describe thoughts.
- Students discuss role of hypotheses and attributes.
- Students discuss type and number of hypothesis.

Instructional a Nurturant Effects of Concept Attainment Model

Instructional _____

Nurturant- - - - - - - - - -



1.5.0 Rationale of the Study

Science to day is becoming increasingly complex and abstract. Thus emphasizes the need from the earliest stage of science deduction for proper understanding of the basic principles and the process of scientific abstraction and creative thinking. It is therefore important that new objective based curriculum should be framed and new method and techniques teachers in order to make the teaching of science effective and efficient.

These are the days of knowledge explosion. Hence, the learners must be prepared to process information suitably and meaningfully so that the information can be retained for a longer time and can be used in different situation of life. In order to accomplish this objective, the root and fruit of knowledge, that is, the pupils must attain concept, 'concept' formation is the first step towards concept attainment.

Large no of studies were conducted in India and abroad where the concept attainment strategy was found to be superior to traditional method in teaching concepts (Seggies, 1964; Wausimer, 1970; Chelbek, 1970; Moore, 1973; Singleton 1977; Zammarelli, 1977; Bergmann, 1980; Contessa, 1980; Miller, 1980; Rollens, 1980; Simon, 1980; Cook, 1981; Musa, 1981; Rowe, 1981; Siokan, 1981; Pandey, 1981; Change, 1982; Hunnicutt, 1982; Charles, 1982; Agarwal & Mishra, 1983; Chitrive, 1983; Gerston, 1983; Stout, 1983; Crisman, 1984; Baddar, 1985;Kumara, 1985; Pani, 1985; Shepherd, 1985; Vermont, 1985; Agrawal, 1985; Frakes, 1985; Gangrade, 1986; Geibprasert, 1986; Gibson, 1986; Keller, 1986; Lynch, 1986; Roth, 1986; Passi, Singh and Sansanwal, 1989; Bhaveja, 1989; Singh, 1990; Vaidya, 1990 and

Manocha, 1990; Salvi, Bewa, 1991; Jamini, 1991; 1991; Kaur, 1991; Mahajan, 1992; Mohanty, 1992; Ojha; 1996)

The investigator found very few studies conducted where the effect of concept attainment model in terms of achievement in science. Some of the studies indicated above also not present the clarity about the effectiveness of the CAM on the sample which th researcher had undertaken. Thus, to fill up this void the researcher conducted the present study.

1.6.0 Statement of the Problem

"EFFECTIVENESS OF CONCEPT ATTAINMENT MODEL (CAM) IN TERMS OF ACHIEVEMENT IN SCIENCE OF CLASS - VIII "

1.7.0 Objectives of the Study

The study was addressed to the following major objectives :

1. To study the effectiveness of concept attainment model(CAM) in terms of achievement of students in science.

2. To compare the achievement of students in science of those who taught through the concept attainment model with that of those who taught through the traditional method by taking the pretest scores of achievement of science as covariate.

3. To compare the general mental ability of the students who taught through the concept attainment model with that of those who taught through the traditional method.

4. To study the effect and interaction of treatment and sex on achievement in science.

5. To study the effect and interaction of treatment and sex on general mental ability.

1.8.0 Hypotheses

1. There will be no significant difference between the adjusted mean scores of achievement in science of students taught through the concept attainment model and the students who taught through the traditional method when their pre-test scores of achievement in science are taken as co-variate.

2. There will be no significant difference between the mean scores of general mental ability of the students who taught through the concept attainment model with that of those who taught through the traditional method.

3. (a) There will be no significant effect of treatment on achievement in science.

   (b) There will be no significant effect of sex on achievement of students in science.

   (c) There will be no significant effect of interaction between treatment and sex on achievement in science.

4 (a) There will be no significant effect of treatment on general mental ability .

(b) There will be no significant effect of sex on general mental ability.

(c) There will be no significant effect of interaction between treatment and sex on general mental ability.

1.9.0 Delimitations of the Study

The constraints under which the study was conducted are remained confined to the following: -

1. The study is limited only to the state of Madhya Pradesh.
2. The syllabus for class-VIII was M.P. Board
3. The study was conducted only in the government schools M.P.
4. The experiment is conducted in only Hindi medium schools.
5. The treatment was given only for ten days.
6. The lesson plans were developed in Hindi language.