

## **A Study of Relative Effectiveness of Inductive Thinking Model and Concept Attainment Model in Teaching Mathematics**

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**Abstract:** *The present study investigate the relative effectiveness of inductive thinking model and concept attainment model with respect to achievement towards mathematics learning. The sample was drawn from class IX and X students from a govt. aided school in the district of Burdwan . Instructional material based on two models was prepared on the chapter Interest. A pretest was taken to judge the condition of the students. Two homogenous group was prepared using the pretest score . Instructional material prepared using ITM implemented on Group A and CAM instructional material was implemented On Group B.*

**Keyword:** *Inductive Thinking model ,concept attainment model ,achievement in mathematics*

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Date of Submission: 20-04-2019

Date of acceptance: 04-05-2019

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### **I. Introduction**

A model of teaching is a plan or pattern that can be used to design face to face teaching in classroom. Basically models are perspective teaching strategy design to accomplished particular instructional goals. Model of teaching is planed or guided, patterned or strategic teaching. It has systematic procedure to modify the behavior of learner and is best on certain assumption. Joyce and Weil (1992)<sup>2</sup> classified models of teaching into four families based on different orientations of human being towards their worldview and the universe. They are information processing family, personal family, social family, behavioral system family.

The effect of in Inductive thinking model (ITM) and concept attainment modal (CAM) which will be studied is under information processing family .The fundamental elements of model of teaching are orientation ,syntax, social system, principal of reaction ,support system and application of the model . The orientation describes the goal and objective of the model ,the theoretical assumption ,the principal and the major concepts underlying the model .The syntax describes the sequence of activities which are called phases .Each model has distinct flow of phases .Social system depicts the role and relationship of student and teacher. The teacher is the leader of the classroom, the leadership role varies greatly from model to model. Next phase tells us how to regard the learner and how to respond to what the learner does .Support system describes the supporting condition necessary to attain the goal of the model .

In education, teaching is considered as the sharing of experiences of teacher and the students to obtain maximum output of teaching learning situation. Teaching and learning of science emphasize on understanding of the different concepts that shapes science. For teachers it is important to know students' conceptions and learning difficulties of these concepts. According to cognitive theories of learning, students construct their own mental concepts when trying to understand scientific concepts (Pines and West, 1986)<sup>5</sup>. Depending on the students' background, experience, attitude, and ability, their conceptions will differ from the scientific ones (Nakhleh, 1992)<sup>4</sup>. In the constructivist learning, development in cognition and improvement in conceptualization depends on the process used to internalize the knowledge. As a result all learning is a process of discovery.

The selection of teaching models is determined by the conditions under which the course is taught and by the objectives of the course. A science teacher should use several methods of teaching to realize various objectives: Cognitive, Affective and Psychomotor. The artistry of teaching science depends on how skillfully the teacher blends several teaching skills into a unified teaching lesson. The nature of the lesson, the personality and goals of the teacher, classroom climate and the interests and the needs of the students determine the ultimate selection and utilization of appropriate teaching model of science.

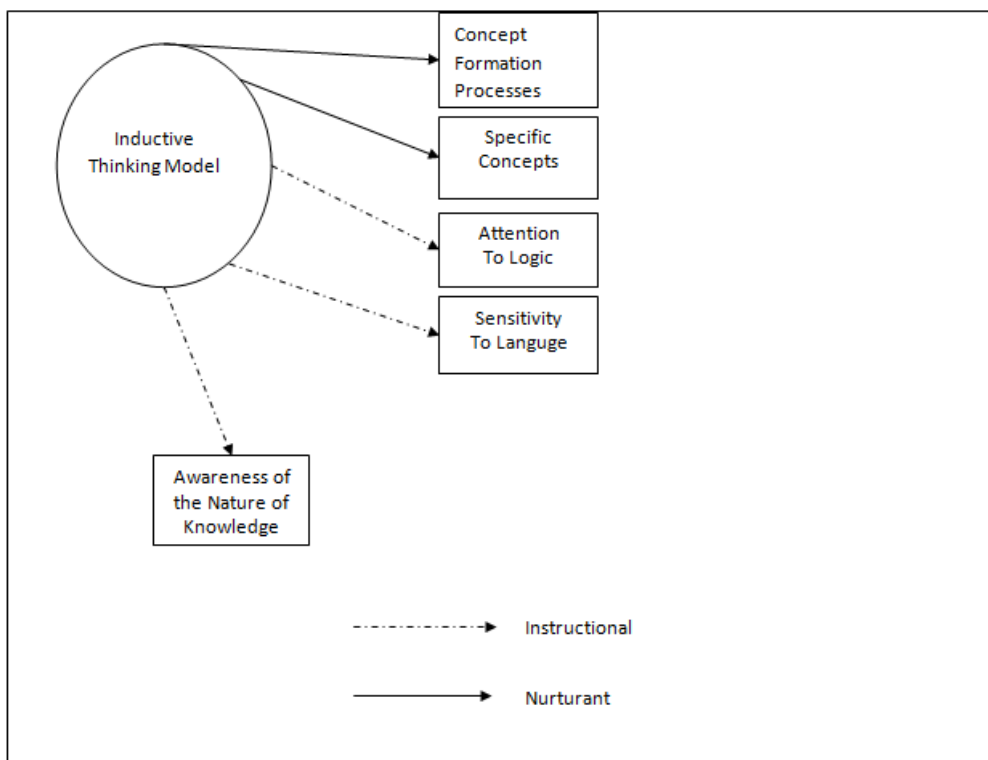
Most of the experts in this field believed that teaching learning process is the key factor for understanding the concepts of mathematics. To adjust with the rapid explosion of knowledge of mathematics, the learners must be prepared to process information suitably and meaningfully so that the information can be treated for a longer time and can be used in different situations of life. To accomplish these objectives, the

learners have to frame a concept in his cognitive domain. Transfer of learning mainly depends on concept formation because these concepts are the key building blocks of the structure of knowledge (Khan and Saeed, 2010)<sup>3</sup>.

**Theoretical Background :** Concept attainment require a student to figure out the attribute of a category that is already formed in another person’s mind by comparing and contrasting examples .More than thirty five years ago, Hilda Taba and her work in the school of California,USA, provided a first rate example of a teaching strategy, designed to improve students’ ability to handle information. Taba identified three inductive thinking task, first is concept formation, second is interpretation of data, last one is application of principle.

Concept Formation			
	Over activities	Covert mental operations	Eliciting question
1.	Enumeration, listing	Differentiation (identifying separatr items)	What did you see? Hear? Not?
2.	Grouping	Identifying common properties, abstracting	What belongs together? One what criterion?
3.	Labeling, categorizing	Determining the hierarchical order of item super and subordination.	How would you call these group? What belongs to what?
Interpretation of Data			
	Over activities	Covert mental operations	Eliciting question
1.	Identifying critical relationships	Differentiating	What did you notice? See? Find?
2.	Exploring relationship	Relating categories to each Other Determining cause-and-effect relationship	Why did this happen?
3.	Making inferences	Going beyond what is given Finding implications, extrapolating	What does this mean? What picture does it Create in your mind? What would you Conclude?
Application of Principles			
	Over activities	Covert mental operations	Eliciting question
1.	Predicting Consequences, Explaining unfamiliar Phenomena, hypothesizing	Analyzing the nature of the Problem or situation, Retrieving relevant knowledge	What would happen if...?
2.	Explaining and/or Supporting the Predictions and hypotheses	Determining the causal links Leading to prediction or hypothesis	Why do you think this Would happen?
3.	Verifying the prediction	Using logical principles or Factual knowledge of Determine necessary and Sufficient conditions	What would it take for This to be generally true or Probably true?

The concept – formation strategy is especially applicable to the education of young children. The strategy is also beneficial to students in the upper grades who must learn and process masses of information. Concept formation is a means of pulling discrete items together into larger conceptual form.



**Delimitation**

The study was delimited to IX and X class students from a govt. aided school of WBBSE only.

**Objective:**

1. To compare the performance in mathematics of inductive thinking model group and concept attained model group.

**Hypothesis:**

- A. The performance on mathematics of concept attainment model group will be higher than inductive thinking model group.

**Methodology:**

**Population:** The population of the study was all students of class IX and X under west Bangal board of secondary education .

**Sample:** The study was conducted on a random sample of 100 students -50 from class IX and 50 from class X of a govt. aided High school, Asansol Subdivision, West Bengal affiliate to WBBSE. It was a purposive sampling.

**Tools:**

1. Instructional Materials prepared in accordance with CAM and ITM on the chapter ‘Interest’ of class IX and X mathematics.
2. Question Papers for pretest and posttest that developed by the investigator.

**Procedure:** Firstly by a pretest was administered to all the students of class IX and X. The answer Sheet was scored to obtain information regarding the previous knowledge of the students. Then the students was divide into a two groups

	GR A	GR B
Class IX	25	25
Class X	25	25

GR.A contain 50 students and also the GR. B Secondly: Group A was taught by inductive thinking model as GR.B was taught by concept attainment model of teaching by the investigator. Thirdly posttest was administered to both the group the answer sheets were scored with the help of scoring key.

Result and observation : The mean of the group A is greater than group B which shows Inductive Thinking Model is good for teaching Mathematics.

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Ranjita Sinha. "A Study of Relative Effectiveness of Inductive Thinking Model and Concept Attainment Model in Teaching Mathematics." *IOSR Journal of Research & Method in Education (IOSR-JRME)* , vol. 9, no. 2, 2019, pp. 42-45.