

PERSPECTIVE OF CONCEPT ATTAINMENT MODEL WITH RESPECT TO MATHEMATICS LEARNING OF STUDENTS WITH VISUAL IMPAIRMENT

¹Seema Chaudhary, ²Dr. Yogendra Pandey

¹Research Scholar, ²Associate Professor

¹ Faculty of Education (K),

¹Banaras Hindu University, Varanasi, Uttar Pradesh, India

Abstract: Concept attainment model is a type of instructional strategy and in this strategy students identify the attributes of given examples, and distinguish examples according to identified attributes and which will be further categorise in positive and negative examples. It is basically learner centred teaching method, which encourages critical thinking and logical reasoning among learners including special needs. This model is developed to identify ideas to introduce content.

This paper deals with perspective of concept attainment model with respect to mathematics learning of students with visual impairment. The goal of this study to make strategies which can be used to help students with visual impairment and to maximize their interest in learning and increase their potential in mathematics learning. As due to lack of proper teaching method students with visual impairment lag behind to sighted children so this study suggest strategies which is beneficial for better mathematics learning of students with visual impairment

Index Terms - Concept attainment model, mathematics learning, Students with visual impairment

I. INTRODUCTION

Mathematics is a fundamental part of school curriculum and it occupies a crucial role in daily living as well as in the learning of other subjects. It provides an opportunity to every individual to explore in domestic and business deals, scientific discoveries, and technological breakthrough, problem-solving and decision making in different situations in life (Chinaedum, 2016). Mathematics plays significant role in all areas of life. It is also highlighted in National Policy on Education (1986), as follows – “Mathematics is should be visualized as the vehicle to train a child to think, reason, analyze, articulate logically. Apart from being a specific subject it should be treated as concomitant to any subject involving analysis and reasoning” (Kulshrestha, 2003).

It has been observed that mathematics subject is easily accessible to sighted students but it is less accessible students with visual impairment because there are many mathematics concepts that cannot be explored by touch and are put across through visual observation (Cited in Maguvhe 2015). Tripathi (2007) found that the lack of vision does not affect the aspiration level of students with visual impairment. The most problem in learning mathematics is inappropriate teaching method, unavailability of teaching learning and equipments.

Planning the mathematics learning of students with visual impairment is all about selection of content to be included, selection of processes, selection of the appropriate teaching method and skills to be practiced, and selection of appropriate activities to familiarize the students with visual impairment. Keeping in the mind the whole course content and principle of curriculum adaptation some new teaching methods must be adapted by the teacher. Teaching of mathematics is based on abstract ideas and concept therefore it is important that new method and techniques of teaching must be introduced in order to make the teaching mathematics more effective and efficient for students with visual impairment. Hence the students with visual impairment must be prepared to practice information properly and meaningfully so that the information can be retained for longer time and can be used in different situations of life. To improve the ability of students with visual impairment for understanding of mathematics concept to use concept attainment model as a teaching method. Several studies suggested that concept attainment model help mathematics learning in classroom. According to Angraini, Kartasasmita and Dasari (2010) Concept attainment model is very relevant in teaching of mathematics because the concept attainment models can foster understanding of mathematics logically, critically and systematically.

II. THEORETICAL FRAMEWORK OF CONCEPT ATTAINMENT MODEL

The concept attainment model (CAM) is historically linked with the work of Bruner, Goodnow and Austin. This model belongs to the category of information processing models and named as Bruner's Concept Attainment Model. 'Information processing' refers to the ways people handle stimuli from the environment, organise data, sense problems, generate concepts, and find solutions to problems and employ verbal and non-verbal symbols (Joyce & Weil, 1972 cited in Mangal, 2010). CAM is built around the study of thinking conducted by Bruner. The Bruner's Concept Attainment Model states that the role of teacher is to create situations in which students can learn on their own rather than to provide packaged information to students. According to Dictionary of education (2002), concept attainment model is class room teaching concepts. The basic steps, as in any lesson, are planning activities, implementation of activities and evaluation. In planning the following steps are involved: Identification of goals, selection of examples and selecting the appropriate medium for presenting the examples (i.e. pictures, models, specimens, etc.). The implementation activities involve presentation of examples (in the proper sequence) and the analysis of characteristics. The final step in implementation stage is 'closure' that results in the definition of the concept and the giving the additional examples, etc. At the evaluation stage, the attainment is tested. (Page no-85). It provides an efficient method for presenting organized information from a wide range of topics to students at every stage of development (Patel, 2014).

III. STRUCTURAL FRAMEWORK OF THE CAM

(1)Focus: The main focus of this model to develop inductive reasoning of the students. A number of examples are presented and students discriminate the attributes of things, person, events and place them into categories.

(2)Syntax: Syntax divided into three phases of this model. The first phase of this model is presentation of data & identification of concept. In this phase students compare attributes in positive and negative examples. Students generate hypothesis and state a definition according to the essential attributes. The second signify phase in which student testing attainment of concept, teacher confirm students hypothesis, names, concept & restate definition according to the essential attributes and the third phase students analyse their strategies for attaining concepts in their attributes.

(3)Social System - In the concept attainment model, the teacher play an important role. Teacher motivates students and guides them for the formulation and analysis of concepts. Teacher constructs examples which are both positive and negative examples of concepts and present it with clear attributes.

(4) Support System - In this System the data are presented with positive & negative examples to the students and the students describe their attributes, the teacher can record or write those attributes. In this way the teacher can help the students through support system.

IV. WHY USE CONCEPT ATTAINMENT MODEL

Several studies were conducted to support Concept attainment model (CAM). Minikutty (2005) found in his study that the Concept Attainment Model of instruction was very effective to develop cognitive ability of academically disadvantaged students. The concept attainment model can be used as a way to introduce, summarize, or to evaluate the topic (Joyce et al., 2004; Reid, 2011 cited in Mayer, 2012). Some other research suggests that the use of teaching strategy for the presentation of models, analogies and metaphors will enhance student understanding and reduce misconceptions (Sunikumari, 2012). Fay (1994) described CAM as a teaching approach that helps students develop skills for inductive and deductive thinking while learning subject matter in any field in a constructive and meaningful way. Wanjari (2005) explained that CAM is designed to teach concepts and help students become more efficient at learning and creating concepts. Anjum (2014) suggested that concept attainment model will encourage the students to engage in learning activities with maximum enthusiasm and this will help them to understand the subject matter more clearly. The CAM as a way to provide an inductive lesson to help students develop critical thinking skills and a better understanding of the target concept (Reid 2011 cited in Mayer, 2012). CAM has an important role in bringing about enhancement in teaching process; it could serve as instructional

approach to manage the class room activities according to the nature of the students with visual impairment in order to achieve a variety of educational objectives (Amita, 2009). As an instructional tool CAM can help to engage students with visual impairment into formulating a concept through the illustration with examples. It serves as an evaluation tool which can improve understanding of mathematics concepts and help build connections among abstract concepts. During identification of concept with essential attributes among positive and negative example makes teaching learning process effective and active. The CAM based lessons helped to increase understanding of the concepts, engaged students with visual impairment to think about their learning, and had a positive effect on their attitudes and motivations in class.

Here's an example of how to use the concept attainment strategy with students with visual impairment

1. Use tactile diagram, model, flash card, and/or actual objects to present both examples and non-examples of the concept.
2. Present the one positive (yes) examples first and one example in one time. Always start with a "yes" example.
3. Follow with a "no" example. The other additional examples should be given in one by one in random order. Avoid giving too many negative (no) examples at one time. Negative examples help students with visual impairment in clarifying what the positive (yes) examples have in common.
4. After identifying the yes example, ask students with visual impairment common attributes of given concept.
5. students with visual impairment explain the attributes of given concept, give unlabeled positive and negative examples (verbal or flash card) and ask for identifying positive and negative examples in "yes" or "no" forms.
4. During the strategy, ask students with visual impairment for "positive (yes) examples to verify that they are getting the concept.
5. Once most students with visual impairment seem to have the concept, ask for attributes that describe it and process that follow it.
6. Mention the name of the concept and explain the process or rule that follow it.
7. Have students with visual impairment discuss their thinking processes throughout the strategy.

V. CONCLUSION

Concept Attainment Model is an effective teaching strategy which makes teaching and learning process interesting. It makes education accessible, for all students especially students with visual impairment. CAM can be used to help students with visual impairment to solve mathematics learning problems and to clarify their misconception so that the achievement of students with visual impairment in mathematics will be higher. CAM can also be helpful for teachers in evaluating the teaching - learning process. They also assess

the achievement of students with visual impairment by identifying misconceptions and missing concepts. Thus using CAM in teaching and learning process of mathematics will be helpful for the students with visual impairment and teachers both.

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