



# Effect of Concept Attainment Model of Teaching on Achievement in Chemistry at Higher Secondary Stage

MR. MAHESH PATEL

Asst. Teacher,  
Shri DNJ Adarsh High School & Shri O. M. Agrawal Higher Secondary School, Deesa.  
Gujarat (India)

## Abstract:

*The present study is experimental in nature. The objective of this study was to study the effect of Concept Attainment Model of teaching on achievement in Chemistry at higher secondary stage. A sample of 100 students was selected at random. 50 students were selected randomly to form an experimental group. Another 50 students were selected randomly to form the control group for the study. The experimental group was given the Concept Attainment Model of teaching and the control group was taught through the Conventional Method (Lecture Method) of teaching. The data was collected and analyzed with the help of suitable statistical techniques. Concept Attainment Model was found to be effective in terms of achievement of students in Chemistry.*

**Keywords:** *Achievement, Cognitive Structuring, Concept Attainment Model, Conventional Method, Teaching Chemistry*

## 1. Introduction

Education is a tri-polar process, in which teacher, student and curriculum are the three poles. The process of teaching and learning is complex one. The process of teaching is planned by teacher for the purpose of better learning of the students. Effective teaching is possible only when teacher has the knowledge and skill of using proper instructional modes. Education is the influence of the environment upon the individual. Through such influence individual develops those capacities which enable him to control his environment, adapt to that environment and to realize and fulfill his responsibilities in a socially desirable manner. Therefore, our societies have provided educational institutions like schools to impart this much desired service to all the individuals and significantly improve their developmental patterns from the very childhood.

The objectives of education have changed from time to time and so has our concept of teaching. What we teach and how we teach depends to a great extent on what we want to achieve. Teaching is both an art and a science. Able teachers always find ways and means to improve their teaching techniques. With the change in time, the teachers are asked to employ newer methods of teaching so that their students are able to cope with the demand of the times. The improvement of the teacher by employing newer methods of teaching and the latest techniques of teaching is a need of the locus. The most recent concept of teaching is teaching the child how to learn, how to discover, how to think and how to inquire. Some sort of teaching has always been going on which might have been of any level. Improvements in the process of teaching have been made from time to time by the teachers. Some research workers, intellectuals, administrators etc. might have made special efforts to improve the teaching process. In fact, every good

teacher in class-room always tries to prepare a model of teaching, then he or she wants to follow it for all times. He also goes on modifying it with the passage of time when he gains more and more experience of class-room teaching. A few models of teaching have been done searched out and are being propagated in different countries in order to derive maximum benefits. Thus models suggest something really very good for modifying the behavior of the learners. Teaching models are just instructional designs. They describe the process of specifying and producing particular environment situations which cause the student to interact in such a way that specific change occurs in his behavior. The teaching models are very useful for teachers for planning and organizing teaching activities. The teacher can make its use in planning curriculum, student teacher interaction and to develop specific teaching aids. Although, the process of teaching learning aims at transmission of knowledge, imparting skills, formulation of attitudes, values and behavior. However, teaching is a complex activity and which is a cluster of different roles and responsibilities. A teacher has to master multiple roles in order to become a role model for the students. Science today is becoming increasingly complex and abstract. It is therefore important that new methods and techniques of teaching must be introduced in order to make the teaching of science more 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 situations of life. In order to accomplish this objective, the root and fruit of knowledge, that is, the pupils must attain concept. The Concept Attainment Model of Teaching was developed by J.S. Bruner, J. Goodrow and George Austine in 1956. Usually it is named as Bruner's Concept Attainment Model. The model emerged out of the study of thinking process in human beings. It is based on the assertion that a human being is endowed with the capacity to discriminate and to categorize things in groups. This model is used for teaching concepts to the students. It enables them to understand fully the similarities and relationship among various things of the environment. Concept Attainment Model 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. It provides an efficient method for presenting organized information from a wide range of topics to students at every stage of development. Models of teaching as an area in research are emerging in a significant manner. Instructional effects and nurturing effects for each of the model of teaching have been hypothesized. On the basis of which research on Concept Attainment Model is needed. So there is a great need for Indian researchers to monitor their research activities in context of new demands from teachers on one hand and research gaps in teachings and models of teaching on the other hand. Therefore, the investigator has selected this problem.

## 2. Objectives

1. To compare the mean pre-test scores of experimental and control groups.
2. To compare the mean post-test scores of experimental and control groups to see the effect of concept attainment model on achievement in Chemistry.
3. To compare the mean post-test scores of boys and girls of experimental group.

## 3. Hypotheses

- Ho<sub>1</sub>** There will be no significant difference in the mean pre-test scores of experimental and control groups.
- Ho<sub>1</sub>** There will be no significant difference in the mean post -test scores of experimental and control groups.
- Ho<sub>1</sub>** There will be no significant difference in the mean post-test scores of boys and girls of experimental group.

#### 4. Method of the Study

Experimental research method was adopted in the present study.

#### 5. Procedure of Sample Selection

For the present study, random sampling technique was adopted to select the sample. The universe from which the sample was selected was class XI students of Shri Adarsh high school, Deesa, District : Banaskantha, Gujarat. Initially a sample of 150 students (84 Boys and 66 Girls) was taken, but for statistical analysis and for discussion of results, it was reduced to 100. It was done with the help of Raven's Standard Progressive Matrices. Only these 100 students were selected for experimental study, whose intelligence score lies between 20 and 45. Out of 100 Students, 50 students were selected as boys and 50 were as girls.

#### 6. Tools Used in the Study

- Intelligence Test
- Lesson plan based on Concept Attainment Model
- Achievement Test in Chemistry (used as pre-test and post-test)

#### 7. Statistical Technique Applied

Descriptive Statistics such as Mean, S.D. were used to compare groups on pre-test scores and post-test scores. Inferential Statistics t-test was applied to find out and to compare the results obtained through descriptive statistics. Graphical Statistics. To have a pictorial view of scores of different variables, graphical statistics was used.

#### 8. Results

*Comparison between Mean Pre-Test Scores of Control and Experimental Groups*

t- value was computed to study the significant difference between mean pre-test scores of experimental and control groups. The results so obtained have been entered in Table 1.

**Table 1: Showing 't' value of Mean Pre-Test Scores of Control and Experimental Groups in Chemistry**

Group	N	Mean	S.D.	t- value	Remarks
Control	50	12.68	1.85	0.341	Insignificant At 0.01 level
Experimental	50	12.82	2.21		

Table 1 reveals that the mean pre-test scores of control and experimental groups are 12.68 and 12.82 respectively and their mean difference (D) is 0.14. The obtained t-value ( $t=0.341$ ) is insignificant at 0.01 level which shows that there exists no significant difference in the mean pre-test scores of experimental and control groups. Hence, the hypothesis, "There will be no significant difference in the mean pre-test scores of experimental and control groups" is not rejected.

*Comparison between Mean Post-Test Scores of Control and Experimental Groups t-value was computed to study the significant difference between mean post-test scores of experimental and control group.*

The results so obtained have been entered in Table 2.

**Table 2: Showing 'T' Value of Mean Post-Test Scores of Control and Experimental Groups in Chemistry**

Group	N	Mean	S.D.	t-value	Remarks
Control	50	18.72	1.92	10.32	Significant at 0.01 level
Experimental	50	22.58	1.82		

Table 2 reveals that the mean post-test scores of control and experimental groups are 18.72 and 22.58 respectively and their mean difference (D) is 3.86 which reveals that group taught with CAM has higher mean post -scores as compared to group taught with Conventional method. The obtained t-value ( $t=10.32$ ) is significant at 0.01 level which shows that there exists significant difference in the mean post-test scores of experimental and control groups. Hence, the hypothesis, "There will be no significant difference in the mean post -test scores of experimental and control groups" is rejected.

#### *Comparison between Mean Post-Test Scores of Boys and Girls of Experimental Group*

t- value was computed to study the significant difference between mean post -test scores of boys and girls of experimental group. The results so obtained have been entered in Table 3.

**Table 3: Showing 't' Value of Mean Post-Test Scores of Boys and Girls of Experimental Group**

Groups	N	Mean	S.D.	t-value	Remarks
Boys	25	22.16	1.69	1.67	Insignificant At 0.01 level
Girls	25	23.00	1.85		

Table 3 reveals that the mean post-test scores of boys and girls of experimental group are 22.16 and 23.00 respectively and their mean difference (D) is 0.84. The obtained „t“ value ( $t=1.67$ ) is insignificant at 0.01 level which clearly shows that boys and girls do not differ significantly in their mean post -test scores when taught through CAM. Hence, the hypothesis, "There will be no significant difference in the mean post -test scores of boys and girls of experimental group" is not rejected.

## 9. Findings

The notable findings are given below:

- There exists no difference in the mean pre-test scores of experimental and control groups. Reason for this difference may be that both the groups are equal in their intelligence.
- There exists difference in the mean post -test scores of experimental and control groups. Reason for this difference in achievement may be that CAM (experimental group) was found to be superior in comparison to Conventional method (control group).
- There exists no difference in the mean post -test scores of boys and girls of experimental group. Reason for this difference may be that CAM (experimental group) was found to be equally superior for both genders for learning Chemistry.

## 10. Conclusion

On the basis of the results drawn, the following conclusions have been drawn:

- Concept Attainment Model of teaching is superior and effective in terms of Chemistry concept understanding of students in comparison to Conventional Method.
- Concept Attainment Model has significantly higher students liking in comparison to Conventional Method.

## 11. Educational Implications

As the present study review that Concept Attainment Model was effective in terms of Chemistry concept understanding of students, hence CAM should be used by the school teacher in class-room teaching especially in teaching Chemistry concepts. In order to orient the interest of teachers towards the use of CAM in classroom teaching, workshops and seminars should be organized. Concept Attainment Model plays a significant role in improving the achievement of students in the following way:

- CAM helps in strengthening the cognitive structure of the students.
- It can be used with all the categories of the students viz. high, average and low intelligent students.

- It is beneficial for boys as well as girls.
- It provides deep understanding of the concept.
- It provides wide opportunities to students for acquiring concepts, interpreting the data and applying the principles in new and differential situations.
- In CAM, students get opportunity to think openly and freely.
- It can be used effectively to teach Chemistry.

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