International Journal of Education and Psychological Research (IJEPR) Volume 7, Issue 2, June 2018
Print - ISSN: 2349 - 0853, e-ISSN: 2279 - 0179 Available online at www.ijepr.org
Orignal Research Article Open Access

Comparative study of effectiveness of of Concept Attainment Model over Traditional method of teaching an unit from physical science between homogenous and heterogeneous group in higher secondary classes

C L Bhaskara[1]

Abstract:

The Objective of the Current study is to study the effectiveness of concept attainment model and traditional method of teaching set of concepts from physical science in relation with concept achievement. Being the conceptual subject Physical needs the distinct teaching methods. It has been felt that in spite of strenuous efforts of science teacher, students fail to grasp the certain concepts of the subject which lead disinterest among students towards physics in general. Experimental research method was used for present study. Tool used for the research self-prepared physics lesson "thermal states of matter' from higher secondary level lesson transcripts of Physics and lesson plans of traditional method and for post-test standardized by team of experts in the field of education. The present study reveals that there is a significant difference between concept attainment model(CAM) and traditional method on the achievement of students in understanding of concepts of physics from the unit " Thermal States of Matter "This study reveals that there is a significant difference between concept attainment model(CAM) on the achievement of students for acquisition of relevant concepts from the unit 'Thermal states of matter' in higher secondary classes and traditional method (by evaluation approach).

Key words.: *processing models, Concept attatient model(CAM), traditional method of teaching, Inducto- deductive approach, Evaluation approach model of planning a lesson.*

Article History: *Received: 22nd May 2018, Revised: 02nd June 2018, Accepted: 13th June 2018, Published: 30th June 2018.*

I. INTRODUCTION

A model is a representation of generally in miniature, to show the construction or appearance of something. The information processing model is a framework used by cognitive psychologists to explain and describe mental processes. Just like computer, the human mind takes information, organized and stores it to be retrieved at a later time. Just as the computer has an input device, a processing unit, a storage unit, and an output device, so does the human mind have equivalent structures.

The model has been developed from the works of Jerome Bruner, Jacqueline Good now and George Austin. The main assumption of this model is that our environment is very complicated and it has many types of objects with different areas. We remain involved in the process of categorizing these objects. By categorization, the complexity of the environment reduces. The process of categorization increases the need of new and continuous learning. By knowing a concept one can plan future learning related to the concept.

In the family of Information Processing Model, mainly there are three broad categories. These are Advanced Organizer Model, Enquiry Training Model and Concept Attainment Model. Since the present study is based on Concept Attainment Model (CAM), detailed deliberation is given only CAM keeping aside the other ones.

In this model students figure out the attributes of a group or category that has already been formed by the teacher. To do so, students compare and contrasts examples that contain the category of the concept with examples that do not contain those category. They, then separate them into two groups, Concept attainment group and non-concept attainment group. Then they try to figure out non concept attainment group with familiar and unfamiliar examples and try to illustrate them in their own language. Gradually in the process non concept attainment group transformed to Concept Attainment Group and achievement in instructional objectives occurs.

It is mainly designed to clarify ideas and to introduce aspects of content. It engages students into formulating a concept through the use of illustrations, word cards or specimens called examples. Students who catch onto the idea before others are able to resolve the concept and then are invited to suggest their own examples, while other students are still trying to form the concept. For this reason, concept attainment is well suited to classroom use because all thinking abilities can be challenged throughout the activity. With experience, children become skilled at identifying relationships in the word cards or specimens. With carefully chosen examples, it is possible to use concept attainment to teach almost any concept in all subjects.

II. STEPS OF CONCEPT ATTAINMENT

1. Select and define a concept.
2. Select the attributes
3. Develop positive and negative examples
4. Introduce the process to the students
5. Present the examples and list the attributes

[1] Assistant professor in Education, Vijaya Teachers College, 30th cross, 11th main, Jayanagara, Bengaluru 560011

6. Develop a concept definition
7. Give additional examples
8. Discuss the process with the class
9. Evaluate

Following are the structural framework of the CAM;

I. Focus: The main focus of this model is to learn or to attain a concept. This type of learning can take place by categorizing activity. This categorizing activity includes the 'identification events' and 'placing into classes on the basis of certain criteria.

II. Syntax: According to Bruner and colleagues, the concept attainment model has three variations. These can also be termed as 'model'. The activities of the syntax of these three models differ, but these three variations or models develop from the same conceptual base. These variations or models are

- **Reception -** oriented model it functions directly for the teaching of elements of a concept.
- **Selection -** Oriented model helps in using the collected information regarding the activities related to the concept attained through the reception - oriented model.
- **Unorganized materials model** Ungrouped material model, the concept theory and concept attainment activity are transferred to the real life situation and ungrouped data is used in it.

III. Social System: In the concept attainment model, the teacher constructs examples and obtains ideas and materials from books and other sources before starting the teaching work

IV. Support System: In this model, when the data are presented to the pupils and the pupils describe their attributes, the teacher can record or write those attributes on the blackboard. In this way the teacher can help the pupil through support system.

The amount of scientific knowledge accumulated over the past couple of decade's bears witness to the knowledge explosion, and can be no longer ignored. Teaching of science is of greater interest today than it was in the past especially at secondary and higher secondary level. Even with tremendous progress of science and technology and increasing interest of science. Many researchers have been conducted on the use of innovative methods, models and techniques to teach physical science that includes both physics and chemistry. Concept Attainment Model has been proved one of the innovation models of teaching for years this model is scientifically designed to minimize the individual differences in the classes, by giving correct reinforcement, feedback accurately at the particular time. Therefore, has been proved beneficial for all categories of students

Rationale of the study of effectiveness of Concept Attainment Model of teaching an unit from physical science between homogenous and heterogeneous group in higher secondary classes:

Learning strategies should be taught to students in every lesson as they can guide in shaping and forming their own learning systematically especially when we use the learner Centred approach. Students should also be taught to use learning organization strategies to become autonomous learner. In order to cater the dynamic learning style of the learners, a teacher need to be innovative and research oriented.

Teaching a subject like physics needs special teaching methods. It has been felt that in spite of strenuous efforts of physics teacher, students fail to grasp the certain concepts of subject, which lead disinterest among students to wards physics. More ever students are often unable to apply their knowledge to advance studies.

Therefore there is a need to study the effectiveness of the teaching methods in physics .This study is based on facts collected from two groups one is homogeneous and another is heterogeneous.

The main aim of this study is to bring out the relative effectiveness of concept attainment model of teaching and conventional method of teaching on the achievement of students for acquisition of physics concepts in class XI for the unit Thermal states of matter that contain concepts like; *thermal expansion, Anomalous expansion, specific thermal capacity, calorimetry, latent heat capacity of substance, heat transfer, Black body radiation and Newton's law of cooling.*

In this regard this study is stated as: 'study of effectiveness of Concept Attainment Model of teaching physical science between homogenous and heterogeneous group in higher secondary classes'

III. OBJECTIVE OF THE STUDY

1. To study the relative effectiveness of Traditional teaching(commonly Inductive and deductive approach) of physical science (PHYSICS) to the higher secondary school students.
2. To study the relative effectiveness Concept Attainment Model for Teaching of physical science (PHYSICS) to the higher secondary school students.
3. To compare the effect of Traditional teaching method and Concept Attainment Model in teaching of physical science (PHYSICS) to the higher secondary school students.

IV. HYPOTHESIS

1. There is no significant difference between the achievement level of homogeneous group and heterogeneous group students, taught, physics lesson THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching.
2. There is no significant difference between the achievement level of boys and girls students, taught, Physics lesson THERMAL STATES OF MATTER through traditional method of teaching.
3. There is no significant difference between the achievement level of boys and girls students, taught, Physics lesson THERMAL STATES OF MATTER through concept attainment model of teaching.

4. There is no significant difference between the achievement level of boys and boy's students, taught physics lesion THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching.
5. There is no significant difference between the achievement level of Girls and girl students, taught physics lesson THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching.

V. METHOD OF STUDY

Experimental method of research was employed to study the effectiveness of CAM and Traditional method of teaching. In the present study, the homogeneous group and heterogeneous were naturally assembled groups. So the investigator decided to conduct the study using the 'Non-equivalent post-test experimental design'. The experimental treatment i.e. teaching through Concept Attainment Model was given to heterogeneous (Experimental group) the other group was homogeneous group, taught through traditional teaching method (where formal inductive deductive approach followed). Two groups were taught on the alternative days for one month and after one month, post-test (achievement test for 25 marks) was administered to the two groups. Post-test was the standardized Concept achievement test prepared by team of subject expert and teaching methodology experts in the field of physical science.

Sample

A sample comprises of 100 (40male and 60 female) [Section a 12 boys and 28 girls, in section B 25 boys and 35Girls] English medium 11th standard (In Karnataka it is pre university level) from Bengaluru South district reputed coaching Centre. Here coaching class unit is considered as heterogeneous whereas particular college students [Vijaya pre university college, Jayanagar, Bengaluru] students are considered as homogeneous group were selected randomly.

Homogeneous group		Heterogeneous group	
Boys	Girls	Boys	Girls
40	60	25	35

Tool

A tool is prepared by team of content developers from Educational organization in relation with self-developed concept attainment model and lessons plans of traditional method (plan of action executed is Evaluation approach)was developed by investigator.

VI. ANALYSIS AND INTERPRETATION OF RESULT

Hypothesis 1: There is no significant difference between the achievement level of homogeneous group and heterogeneous group students, taught, physics lesion THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching.

Category	Homogeneous group	Heterogeneous group
Boys	40	25
Girls	60	35
Average	16.3	13
Standard deviation	6.21	5.7
t-test	3.40	
Result	Significant	

- From the above table, whole data shows that, there is a significant difference between homogeneous group and Heterogeneous group. Hence the null hypothesis is rejected.

Hypothesis 2: There is no significant difference between the achievement level of boys and girls students, taught, Physics lesson THERMAL STATES OF MATTER through traditional method of teaching.

The given table shows the average score of students taught by traditional method (Homogeneous group).

Category	Boys	Girls
	40	60
Average	13.9	13.5
Standard deviation	6.60	7.05
t-test	0.28	
Result	Not significant	

- From the above table it shows that there is no significant difference between boys and girls of homogeneous group. Hence the null hypothesis is accepted.

Hypothesis 3: There is no significant difference between the achievement level of boys and girls students, taught, Physics lesson THERMAL STATES OF MATTER through concept attainment model of teaching

The given table shows the average score of students taught by traditional method (Homogeneous group).

Category	Boys	Girls
	25	35
Average	12	14.43
Standard deviation	5.79	8.88
t-test	1.28	
Result	Not significant	

- From the above table it shows that there is no significant difference between boys and girls of heterogeneous group. Hence the null hypothesis is accepted

Hypothesis 4: There is no significant difference between the achievement level of boys and boys students, taught physics lesion THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching.

Category	Boys (Homogeneous group	Boys (Heterogeneous Group)
	40	25
Average	13.9	12
Standard deviation	6.60	5.79
t-test	1.21	
Result	Not significant	

- From the above table it shows that there is no significant difference between boys of homogeneous group and girls of heterogeneous group. Hence the null hypothesis is accepted.

Hypothesis 5: There is no significant difference between the achievement level of Girls and girls students, taught physics lesson THERMAL STATES OF MATTER through traditional method of teaching and Concept attainment model of teaching

Category	Girls (Homogeneous group	Girls (Heterogeneous Group)
	60	35
Average	13.5	14.43
Standard deviation	7.05	8.88
t-test	0.54	
Result	Not significant	

- From the above table it shows that there is no significant difference between girls of homogeneous group and girls of heterogeneous group. Hence the null hypothesis is accepted

VII. IMPORTANT FINDINGS OF STUDY

1. This study gives an idea about Concept Attainment Model is definitely better than the Traditional Method for student achievement. Whereas this study presents there is a difference in the achievement level of students in two categories when the whole group is concerned.
2. This study observes that, there is no much difference in learning competency between same boys and girl students of same group, as well as in different groups.
3. During practice of this model in an organization, most of the students and subject experts felt that concept attainment model is more suitable for lower primary and higher primary classes than secondary and higher secondary classes.

VIII. SUGGESTIONS FOR FURTHER STUDY

1. The teachers also were encouraged to learn more and test their knowledge when Concept Attainment Model is used. The teachers should have a thorough knowledge in the subject to conduct such classes. The teacher should be able to clear all the doubts of students. The classes will be lively and there will be good teacher-pupil interaction.
2. The teachers should be given an orientation to the theoretical bases of Models and their practical utilities in classrooms.
4. Ideas regarding Models of Teaching should be given to the students teachers, and parents to improve teaching learning conditions.
5. The curriculum designers should also develop awareness on Models of Teaching so that they can implement them in the curriculum

IX. CONCLUSION

The Concept Attainment Model will help the students to learn the theory and apply the newly acquired knowledge simultaneously compared to that of traditional method of teaching.

X. REFERENCES

1. http://science.education.nih.gov
2. http://www.setda.org/web/guest/2020/stem-education
3. Garret. H.E. and Woodworth. R.S. (1981) Statistic in Psychology and Education. Veils fifer and Simons Ltd Bombay-400038
4. Butts, David P. (1971). 'The degree to which children conceptualize from science experiences'. *Curriculum research elementary school science* N.Y.: The Mc. mill company
5. Amity Kumar (2013)Effect of Concept Attainment Model on Acquisition of Physics Concepts *Universal Journal of Educational Research*1 (3):165-169. Retrieved from http://shodhganga.inflibnet.ac.in/handle/10603/22104
6. Sheikh Kashia Anjum, (2013) a study of effect of concept attainment model on achievement of geometric concepts of viii standard students of English medium students of Aurangabad city ISSN; 2278-8808.