CHAPTER - V

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5.1. INTRODUCTION

Teaching is an art in so far as excellent teachers are born but not made. But teaching is also a science in so far as mediocre teacher can become a good teacher by learning to communicate with his pupils in accordance with certain principles of psychology and sociology. In the modern times several theories and principles of teaching have been developed. Methods of teaching are results of application of philosophical, psychological and sociological theories to the teaching-learning situations.

Methods are the ways to understand and practice, the art of teaching. Different methods of teaching have been propounded by a different educational thinker. Teaching as conventionally understood by the traditional teachers is the act of disseminating information to another individual or a group of individuals in the classroom. In this type, the teaching is focused on narration by the teacher and on the part of pupils, listening, retention and recall. Even today the lecture method is commonly used method of teaching in classroom. Most of the teachers give lectures without understanding the cognitive structure and intelligence of students which result in poor learning. To solve this problem there is a great need of change in education.

The teaching environment has very much changed by researches in education. Models of teaching emerged as a major innovation in the recent years. The more important function of any model of teaching is to improve the instructional effectiveness in an interactive situation of curriculum transaction. A teaching model is a comprehensive approach to teaching that typically drives from a theory of education and encompasses key assumptions about what students should learn and how to learn.

The models of teaching provide guidelines to the teachers in planning and organizing curriculum, pupil teacher interactions, preparation of the outline for a guiding student’s activities, in the development of specific teaching aids. Theories of teaching can also be formulated, developed and evaluated with the help of these models.
Concept attainment model is an approach to teaching concepts in which the teacher provides examples and non-examples of the concept and students determine the concept from the examples quoted (Eggen, 1979). CAM was developed by Bruner, Goodrow & Austine in 1956. 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 categorise 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 is an indirect instructional strategy that uses a structured inquiry process. In concept attainment, students figure out the attributes of a group or category that has already been formed by the teacher. To do so, students compare and contrast examples that contain the attributes of the concept with examples that do not contain those attributes. They then separate them into two groups. Concept attainment, then, is the search for and identification of attributes that can be used to distinguish examples of a given group or category from non-examples. Concept attainment is 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.

Learning plays very important role in determining the behaviour of an individual. The miracles of the present day civilization are the results of learning. The process of learning begins from the birth of child and continues till his death. When interaction between individual and environment occurs, the foundation of learning is laid down. The primary objective of teaching is to bring the desirable changes in the behaviour of students through the process of learning. Knowledge of individual differences, requirements and different types of learning helps a teacher to use different teaching methods.
Retention is an active state of learned performance. What is retained during the inactive state must be something in the form of a structure activity as left behind in brain. This modified structure is often called as the memory trace. Hence, retention is very difficult to improve by practice. The capacity of retention is native and cannot be improved by training. Retention plays an important role in our daily life. Our life becomes richer if we are able to retain past experiences which make living pleasant and enjoyable. This ability to remember plays an important role in the process of learning which is essential for our intellectual life. With the help of thinking, we attempt to do new things and solve a numerous problems that we face in our daily life. But all thinking is based on remembering. Thus remembering is an important aid for progress in learning and constructive thinking.

Cognitive style refers to a recurring pattern of perceptual and intellectual activity. Cultures provide people with a range of cognitive styles that are appropriate for different cognitive tasks in different contexts. Psychological anthropologists have attempted to compare cognitive styles cross-culturally. There are many different definitions of cognitive style. Tennant (1988) defined cognitive styles as "an individual’s characteristic and consistent approach to organizing and processing information". Riding, Glass & Douglas (1993) termed cognitive styles as "a fairly fixed characteristic of an individual” and "are static and are relatively in-built features of the individual". Based on the above definitions, in the authors’ points of view, cognitive/learning styles refer to the individual’s consistent and characteristic predispositions of perceiving, remembering, organising, processing, thinking, and problem solving.

Different researchers emphasise different aspects of cognitive styles. Therefore, there are various terms encountered in the literature related to this area. In most situations, cognitive styles and learning styles are used interchangeably, as well as in this research. Generally, cognitive styles are more related to theoretical or academic research, while learning styles are more related to practical applications. A major difference between these two terms is the number of style elements involved. Specifically, cognitive styles are more related to a bipolar dimension while learning styles are not necessarily either/or extremes. Cognitive/learning styles measures conventionally lie somewhere between aptitude measures and personality measures. In addition, cognitive/learning styles in the literature have been viewed in three major
respects—structures, process, or both structure and process (Riding & Cheema, 1991; Tennant, 1988).

According to Schmeck (1983), there are two basic types of cognitive styles. One is global-holist/field dependent/right brained, the other is focused-detailed/field independent/left brained. Schmeck asserted that, although both styles are equally good for problem solving, each style is likely to be associated with greater efficiency in specific tasks. The most effective problem solvers should exercise strategies connected with both aforementioned styles. There is a large body of research about hemispheric preferences. Researchers have conducted relevant studies from different perspectives, such as psychological, physiological, and neurological. According to Sonnier (1991), hemispheric preferences might be a major contributing factor to individual differences. That is, left-hemispheric students are strong in analytical thought processing, while right-hemispheric students are visual processors. In addition, O’Boyle (1986) proposed that the difference in cognitive processing between the two hemispheric asymmetries was more quantitative than qualitative in nature. In other words, it is primarily a matter of degree rather than absolute ability.

The findings of many studies opened up a new area for further investigation. Many investigations revealed that concept attainment model is more effective than traditional methods in different subjects. Cognitive styles and intelligence play an important role in learning. But same may not apply to learning of concepts related to Punjabi grammar. Most of the studies dealing with the models of teaching tried to find out the effectiveness one or the other of the models of teaching or the traditional method. As the structure of language is a standing on the base of concepts so the investigator decided to compare the effect of concept attainment model and conventional model of teaching in relation to cognitive styles and intelligence. It was also observed that the teacher education curriculum in Punjab does not include the models of teaching as an item of instruction or in practical. Appraising the pupil teachers with good techniques of teaching arriving in the horizons’ of world research is a sacred duty of educationists. Hence the importance of present study which focuses on the uniqueness of teaching of Punjabi through concept attainment model is justified.
5.2. STATEMENT OF THE STUDY

EFFECT OF BRUNER'S CONCEPT ATTAINMENT MODEL ON LEARNING AND RETENTION IN PUNJABI IN RELATION TO COGNITIVE STYLES AND INTELLIGENCE

5.3. DELIMITATIONS OF THE STUDY

The study was delimited with regard to following aspects:

(i) The study was conducted on 9th class students of Punjabi only.

(ii) Students were taken from four high schools of Abohar city of district Ferozepur in Punjab only.

(iii) Twenty lessons based on concept attainment model were prepared in Punjabi grammar only.

5.4. OBJECTIVES OF THE STUDY

The study was designed to attain the following objectives:

(i) To develop the instructional material based on concept attainment model for selected units of Punjabi grammar.

(ii) To develop a test to measure the achievement of students in selected units of Punjabi grammar.

(iii) To compare the achievement of groups taught through concept attainment model and conventional model of teaching at immediate and delayed scores.

(iv) To compare the achievement of groups having different cognitive styles at immediate and delayed scores.

(v) To compare the achievement of groups having different intelligence levels at immediate and delayed scores.

(vi) To study the interaction effect of the models of teaching and cognitive styles at immediate and delayed scores.

(vii) To work out the interaction effect of the models of teaching and intelligence levels at immediate and delayed scores.

(viii) To find out the interaction effect of the cognitive styles and intelligence levels at immediate and delayed scores.

(ix) To work out the interaction effect of the models of teaching, cognitive styles and intelligence levels at immediate and delayed scores.
5.5. HYPOTHESES OF THE STUDY

The study was designed to test the following hypotheses in respect of immediate performance and retention.

Immediate achievement

H\textsubscript{1O} The achievement of groups taught through concept attainment model will be significantly higher than that of the groups taught through the conventional model of teaching on Punjabi grammar.

H\textsubscript{2O} There exists no significant difference in means of achievement scores of different cognitive styles.

H\textsubscript{3O} The achievement of groups having different intelligence levels will be significantly different from one another on Punjabi grammar.

H\textsubscript{4O} There exists no significant interaction effect of models of teaching and cognitive styles.

H\textsubscript{5O} There exists no significant interaction effect of models of teaching and intelligence.

H\textsubscript{6O} There exists no significant interaction effect of cognitive styles and intelligence levels.

H\textsubscript{7O} There exists no significant interaction effect of models of teaching, cognitive styles and intelligence levels.

Retention

H\textsubscript{1O} The retention on Punjabi grammar of groups taught through concept attainment model will be significantly higher than that of the conventional model of teaching when measured after an interval of 30 days.

H\textsubscript{2O} There exists no significant difference in means of retention scores of different cognitive styles when measured after an interval of 30 days.

H\textsubscript{3O} The gain retention of groups having different intelligence levels will be significantly different from one another on Punjabi grammar when measured after an interval of 30 days.

H\textsubscript{4O} There exists no significant interaction effect between models of teaching and cognitive styles on retention after an interval of 30 days.
There exists no significant interaction effect of models of teaching and intelligence levels on retention after an interval of 30 days.

There exists no significant interaction effect of cognitive styles and intelligence levels on retention after an interval of 30 days.

There exists no significant interaction effect of models of teaching, cognitive styles and intelligence levels on retention after an interval of 30 days.

**5.6 SAMPLE OF THE STUDY**

The study was conducted on randomly selected purposive sample of 240 male and female students of 9th class, taken from four high schools of Abohar of Punjab. The four schools were randomly selected from the total sample of Abohar. Two intact sections of 30 students were selected from each school.

**5.7 DESIGN OF THE STUDY**

The present study comes under the experimental method of research and pre-test post-test was employed. One group was treated as experimental group and the second group was control group. The experimental group was taught Punjabi grammar related topics with concept attainment model and the control group was taught same topics with conventional model of teaching. In order to analyze the data 2×2×3 factorial analysis of variance was used for the independent variables viz. instructional treatment, cognitive styles and intelligence levels.

The variables of instructional treatment were studied at two levels viz. Concept attainment model and conventional model of teaching. The variable of cognitive styles were studied at two levels i.e. right hemisphere and left hemisphere. The variable of intelligence was studied at three levels such as high, average and low intelligence. The main dependent variable was performance gain which was calculated as the difference in post-test and pre-test scores for each subject.

**5.8 TOOLS USED**

The following tests were used for data collection:

(i) Standard Progressive Matrices (SPM) by Raven, Raven & Court (2000) to measure the intelligence levels of the students.

(ii) Style of Learning and Thinking (SOLAT) by Venkataraman (1994) to identify the cognitive styles of the students.
An Achievement Test on the segment of Punjabi grammar was developed by the investigator himself.

Instructional material was prepared on concept attainment model and conventional model of teaching by the investigator himself.

5.9 PROCEDURE OF THE STUDY

After the selection of sample and allocation of students in two groups for two instructional strategies, the experiment was conducted in six phases as following:

Firstly, the investigator made necessary arrangements with the Principals of the school selected for the experiment. Style of Learning and Thinking (SOLAT) was administered in each school to identify the cognitive styles (hemispheric preferences) of the students.

Secondly, Standard Progressive Matrices (SPM) was administered in each school in order to measure the intelligence level of the students. The grouping of intelligence levels was done to create the three levels i.e. high, average and low. Assuming the trait to be normal, the groups were made on the bases of percentage area under the norms for making three groups. As we know the three groups correspond to area under the normal curve 15.87 (High intelligence), 68.26 (Average intelligence) and 15.87 (Low intelligence) respectively. The percentage of cases was calculated for sub groups of sample in respect of number of cases in each group. For instance N=45 the number of cases for this group was calculated as 15.87×45/100=7.14 i.e. 07 for high intelligence, 31 for average intelligence and 07 for low intelligence.

Thirdly, Achievement Test as pre-test was administered to the students of experimental and control groups. Students were given 45 minutes to complete the test. The answer-sheets were scored to obtain the information regarding the previous knowledge of the students.

Fourthly, treatment was given to the experimental group. Experimental group was taught through concept attainment model. Twenty lessons transcripts based on Punjabi grammatical concepts were taught to students. The control group was taught the same topics with the conventional model of teaching by the investigator himself. Equal time was used for teaching the control group and experimental group.
Fifthly, after the completion of the course, same achievement test was administered simultaneously as post-test to the students of the both groups. Time limit for the test was 45 minutes. The answer-sheets were scored with the scoring key. The scores obtained comprised the criterion post-test scores. After the completion of test students were thanked for their full cooperation and no indication was given about the retention test to be conducted later. Experimental group and control group scores were compared according to their pre-test and post-test scores and difference was called gain achievement scores.

Sixthly, after 30 days same achievement test was administered as retention test to the students of both the groups to get the measure of their retention. The answer sheets were scored with the help of scoring key. The scores obtained comprised the retention scores. Experimental and control group scores were compared according to their pre-test and retention-test scores and difference was called gain retention scores.

5.10. STATISTICAL TECHNIQUES USED

The following statistical techniques were used to analyze the data:

(i) Descriptive statistical techniques such as mean, standard deviation, Kolmogorov–Smirnov test (K-S test) were used to ascertain the normality of the scores.

(ii) Factorial Analysis of Variance (2×2×3) was employed on the scores of the students to test the hypotheses related to the strategies of teaching, cognitive styles and intelligence levels for immediate and the retention scores.

(iii) t-test was employed to find out the significance of difference between means related to different groups and different variables.

(iv) Graphical techniques were used for descriptive analysis and visual perception of the data.

5.11 FINDINGS OF THE STUDY

Immediate achievement

(i) The achievement of the group through concept attainment model was found to be significantly higher than that of the group taught through conventional model of teaching.
(ii) The gain means score difference was not significant for right and left hemisphere groups.

(iii) The achievement of students based on high, average and low levels of intelligence differed significantly.

(iv) The achievement of high intelligence groups was not significantly higher than that of the average intelligence groups but the achievement of high and average intelligence groups was significantly higher from that of the low intelligence groups.

(v) The interaction effect of models of teaching and cognitive styles in respect of gain achievement scores was not significant.

(vi) There was no significant interaction effect of the models of teaching and intelligence levels on gain achievement scores.

(vii) The groups with different cognitive styles did not yield different results on achievement scores in respect of high, average and low levels of intelligence.

(viii) The interaction effect of the models of teaching, cognitive styles and levels of intelligence was not significant on gain achievement scores.

Retention

(i) The retention of concepts of the groups through concept attainment model was found to be significantly higher than that of the groups taught through conventional model of teaching.

(ii) The gain retention means score difference was not significant for right and left hemisphere groups.

(iii) The retention of concepts based on high, average and low levels of intelligence differed significantly.

(iv) The retention of concepts of high intelligence groups was significantly higher than that of the average and low intelligence groups.

(v) The retention of concepts of average intelligence groups was not significantly different than that of low intelligence groups.

(vi) The interaction effect of the models of teaching and cognitive styles in respect of retention scores was found significant.
The left hemisphere groups were significantly higher than that of the right hemisphere groups in respect of retention scores for the concept attainment model.

The right hemisphere groups of the students did not reveal significant retention on both of the models of teaching.

The interaction effect of right hemisphere groups of students taught through concept attainment model was significantly higher than that of the left hemisphere groups of students taught through conventional model of teaching in respect of retention scores.

The interaction effect of left hemisphere groups of students taught through concept attainment model was found yielding high scores than that of the right and left hemisphere groups of students taught through conventional model of teaching in respect of retention scores.

The right hemisphere groups were not found significantly better than that of the left hemisphere groups of students taught through conventional model of teaching in respect of retention scores.

The models of teaching and levels of intelligence did not interact with each other to yield significant results on retention scores.

The interaction effect of cognitive styles and different intelligence levels on retention scores was not significant.

The interaction effect of the models of teaching, cognitive styles and levels of intelligence was not significant on gain retention scores.

5.12 EDUCATIONAL IMPLICATIONS OF THE FINDINGS

The importance of research in education lies in the implications of the findings of study. The findings of this study may be highly helpful in organising training and educational settings as it covers both teachers and students. In the present piece of research work researcher developed an achievement test. It may be profitably added to the list of tools to benefit researchers and educational planners for measuring the achievement of students in Punjabi grammar. The construction of test will provide information to educators, students, parents and policy makers that will be valid, fair and reliable.
The results of the study revealed that concept attainment model is more effective than that of conventional model of teaching. Teachers of teaching of Punjabi will be able to teach basic grammatical concepts with minimum efforts at faster speed with concept attainment model. Curriculum framers and educators can be equipped well by providing this research based information about the students’ preferences for different cognitive styles and role of intelligence in learning and retention.

To conclude it is considered essential to identify the cognitive styles and intelligence levels of children in order to facilitate the process of learning and teaching with selection of appropriate teaching model. For counselors in schools working with language students, findings of the study can be useful in knowing the causes of poorer performance and weak retention.

5.13 SUGGESTIONS FOR FURTHER RESEARCH

The findings of this study open up new areas for further investigation.

(i) The study may be conducted by involving more environmental variables.

(ii) The concept attainment model may be replicated in other subjects like languages, social sciences, natural sciences and mathematics etc. for different classes.

(iii) The study can be conducted for different models of teaching like inductive thinking model, advance organiser model etc.

(iv) Effect of concept attainment model can be studied on other than grammatical topics in languages.

(v) Effect of other variables like age, sex, personality, socio economic status etc. may be studied on the concept attainment model.

A number of suggestions can be given but above mentioned seem to be worthy of immediate attention of educational community.