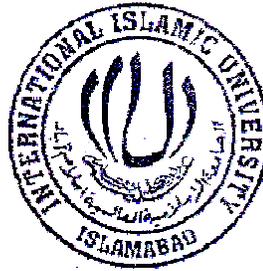


**A COMPARISON OF THE EFFECTIVENESS OF USE OF
TRANSMITTER OF KNOWLEDGE AND INDUCTIVE
INQUIRY MODELS ON STUDENTS ACADEMIC
ACHIEVEMENT**



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A thesis submitted in partial fulfillment
of the requirements for the degree of

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**DEDICATED
TO MY FATHER**

Who was always a source of
inspiration and symbol of
dedicated hard work for me
and will always remain to me.

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ABSTRACT

The study was designed to explore the comparative effectiveness of transmitter of knowledge model and inductive inquiry model on students' academic achievement. The main objectives of the study were to expose each of the two experimental groups to the transmitter of knowledge model and inductive inquiry model respectively and to compare the effectiveness of these models in the teaching of Pakistan Studies. The pretest posttest control group experimental design was chosen for the experiment. It was hypothesized that there would be significant difference between mean achievement scores of the two experimental groups and a control group on the posttest. The population of the study consisted of all the students of 10th class studying in the Government High Schools located in Rawalpindi city. The sample of the study consisted of 90 students of 10th class studying in Govt. High School DAV College Road, Rawalpindi. They were divided into three groups, each group consisted of 30 students. These groups were formed through matching on the basis of their pretest scores. One of these groups was randomly chosen as control group and other two as experimental groups. The independent variable in the study was model of teaching and the dependent variable was the academic achievement of students. The dependent variable was measured through a self constructed 50-item achievement test that was used both as a pretest as well as a posttest. The experimental groups were exposed to the treatment of teaching models while the control group was provided with conventional teaching. The material used for teaching the experimental groups consisted of the lesson plans prepared in the light of each teaching model according to Hunter's seven planning steps. After the treatment of eight weeks duration, the obtained data was analyzed by using the statistical techniques such as mean, standard deviation, coefficient of variation, simple analysis

of variance Scheffe test and Tuckey's test in order to find out whether the difference in the mean achievement score of the comparison groups was statistically significant. The level of significance used in the study was .05. The main results of the study confirmed the research hypotheses. It was, therefore, concluded that students taught through inductive inquiry model showed superior achievement than those students taught through transmitter of knowledge model and through conventional teaching. The study results are in line with previous studies conducted by Schaffer's (1989) Farrell and Hesketh's (2000) but the results do not support the results of Nagata (1995), Rose and Fong (1997), Kalia (2005), Nina Panjunan (2007), Patrick and Elizabeth (2008).

Though results of present study need further confirmation, it is recommended that inductive inquiry model may tentatively be used by teachers of social studies while teaching the subject to secondary classes. Therefore, in future studies a blend of models may be used because there is no single model which is exclusively best for teaching all the subjects at all levels to all students.

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QAISARA PARVEEN

CHAPTER 1

INTRODUCTION

The process of teaching and learning is as old as human beings on the earth. It has been carried out by human beings and even by animals to teach their young ones for successful adjustment in the environment. Teaching, as conventionally understood by a traditional teacher, is just the act of disseminating information to the learner in the classroom. It is generally equated with telling. If we observe traditional classroom teaching, we find that either the teacher is delivering information or one of the students is reading from the text book and other students are silently following him in their own text books. Conventional teaching is simply chalk and talk approach in which students remain passive learners. Instruction is ill organized and rote learning is heavily emphasized. It is simply chalk and talk approach to teaching. Mostly the results of students are not satisfactory due to the presence of this approach. Ever since the beginning of 20th Century, research on teaching has generated useful knowledge about teaching skills, methods and models that can be usefully employed by teachers to promote students learning.

The century old history of research on effective teaching includes three milestones namely, identification of specific teaching skills, integrating these skills into a systematic pattern of instruction and formulation of general models of instruction. Walberg (1986) identified seven skills of effective teaching on the basis of his meta-analysis. These include use of academic learning time, reinforcement, cues and feedback, cooperative learning, classroom morale, higher order questions and advance organizers.

According to Sprinthall and Sprinthall (1990), one of the weaknesses of such a meta-analysis as Walberg's is that the skills do not depict actual patterns of teaching. The analysis of instruction developed by Flanders shows how these elements fit together in actual classroom interaction. Teaching elements have also been combined into general models of teaching. A model is a cluster of strategies that is logically consistent with a certain set of assumptions about how students learn the best. Sprinthall and Sprinthall have simplified research generated teaching modes into three models namely, transmitter of knowledge model, inductive inquiry model and intrapersonal model. Transmitter of knowledge model emphasizes the need to give pupils basic facts and information before they can be expected to think for themselves. They must learn what is already known before they can come up with any new ideas that might fit in with the existing knowledge. The main characteristic of this model is the high degree of structure employed. In this model, the teacher uses advance organizers and the model emphasizes the fifth category (lecturing) of Flanders interaction analysis. The teaching model of inductive inquiry emphasizes discovery of concepts through the process of inquiry. The inductive model is another model is associated with this model relies on Flanders' category four (asking open ended questions), categories two (encouraging or praising) and three (using and building upon student ideas).

Inquiry is the active pursuit of meaning involving thought process that changes experience to bits of knowledge. When we see a strange object, for example, we may be puzzled about what it is, what it is made of, what it is used for, how it came into being and so forth. To find answers of these questions we might examine the object closely, subject it to certain facts, compare it with other more familiar objects or ask people about it and, for

a time, our searching would be aimed at finding out whether any of these theories made sense. All these activities such as observing, theorizing, experimenting, theory testing is part of enquiry. The purpose of the activity is to gather enough information to put together theories that will make new experiences less strange and more meaningful (Suchman, 1964).

It is certain that helping students to develop the ability to think is a major goal of social studies education. One can claim that inquiry does facilitate the development of this enlightening skill (Fair and Kachaturoff, 1988).

Interpersonal model is neither concerned with disseminating information nor does it worry about understanding concepts. It is primarily concerned with human interaction. Sprinthall and Sprinthall (1990) are of the view that teaching and learning can't be exclusively explained by the element of love alone, the quality of pupil - teacher relationship is necessary but insufficient as a teaching model.

Both the Transmitter of knowledge model and inductive inquiry model are important and each model has assets as well as liabilities that are appropriate for the attainment of particular kind of objectives by specific type of students.

Over the past several years, social studies has become a more visible school subject, and the conception of learning social studies has evolved from doing and knowing to experiencing and making meaning. The tacit and piecemeal curriculum that has long characterized the social studies classroom seems to be gradually giving way to more coherent and integrated set of objectives, benchmarks and performance indicators. This approach is goal oriented with an emphasized on learner outcomes: the knowledge, skills, attitudes, values and dispositions to action that teachers wish to develop in students (Alleman and Brophy, 1999, p 334).

The subject of social studies is taught in Pakistan school upto 8th class but in secondary classes the subject of Pakistan studies is included in the curriculum in place of social studies.

The subject of Pakistan studies, containing comprehensive information and material on freedom struggle of the Muslims of the subcontinent and history of Pakistan has been introduced for intermediate, B.A, B.Sc, Engineering, Medical, Commerce and Law students. The major purpose of introducing this subject on all levels of education is to inform the young generation of Pakistan about the freedom struggle and the sacrifices which their forefathers gave to achieve independence for them. The subject of Pakistan studies also aims at unveiling the sacrifices which the million of Muslims of the subcontinent, gave for the accomplishment of Pakistan, under the dynamic, dauntless and sincere leadership of the Quaid-e-Azam (Ikram and Ali, 1990).

1.1 STATEMENT OF THE PROBLEM

Models of teaching are gaining popularity throughout the world of education and are being applied for teaching various subjects at the elementary, secondary and college level. These models either in isolation or in combination, intentionally or unintentionally, might be under some use in our educational institutions but a systematic enquiry into their deliberate use and the effect of them, upon student's learning and achievement has least been explored into. The systematic studies to compare the effectiveness of these models in isolation and in combination have perhaps not been carried out in Pakistan.

Therefore, the research on teaching effectiveness generally follows the paradigm of comparing one method of teaching with another. In this study, the same

paradigm was followed by comparing effectiveness of transmitter of knowledge model with inductive inquiry model.

The researcher intended to investigate the effectiveness of use of transmitter of knowledge model and inductive inquiry model on students' academic achievement.

1.2 OBJECTIVES OF THE STUDY

The main objectives of the study were:

1. To compare the academic achievement of experimental groups taught through transmitter of knowledge model and inductive inquiry model on their post test scores.
2. To compare the academic achievement of experimental group taught through transmitter of knowledge model and control group taught through conventional teaching on their post test scores.
3. To compare the academic achievement of experimental group taught through the inductive inquiry model and the control group taught through conventional teaching on their post test scores.

1.3 HYPOTHESES OF THE STUDY

The alternative hypotheses of the study were as follows:

1. There is significant difference between the mean post-test achievement scores of the experimental groups taught through transmitter of knowledge model and inductive enquiry model and control group taught through the conventional teaching.
2. There is significant difference between the mean post-test achievement scores of students taught through the transmitter of knowledge model and inductive enquiry model.

3. There is significant difference between the mean posttest achievement scores of students taught through the transmitter of knowledge model and those students taught through conventional teaching.

4. There is significant difference between the mean posttest achievement scores of students taught through the inductive inquiry model and those students taught through conventional teaching.

The above alternative hypotheses were tested through the following null hypotheses:

1. There is no significant difference between the mean post-test achievement scores of the experimental groups taught through transmitter of knowledge model and inductive enquiry model and control group taught through the conventional teaching.

2. There is no significant difference between the mean post-test achievement scores of students taught through the transmitter of knowledge model and inductive enquiry model.

3. There is no significant difference between the mean posttest achievement scores of students taught through the transmitter of knowledge model and those students taught through conventional teaching.

4. There is no significant difference between the mean posttest achievement scores of students taught through the inductive inquiry model and those students taught through conventional teaching.

1.4 DELIMITATIONS OF THE STUDY

The study was delimited to:

1. Only one boy's school of the Rawalpindi city.

2. Students at Secondary level
3. The subject of Pakistan Studies.
4. Four chapters (Chapter 2, 3, 8 & 9) of Pakistan Studies text book prescribed by the Punjab Text book board, Lahore.
5. First three levels of Bloom taxonomy of cognitive domain that is knowledge, comprehension and application levels of objectives.

1.5 SIGNIFICANCE OF THE STUDY

Currently, the subject of Pakistan Studies is taught at the elementary level and Secondary stage quite differently and un-psychologically. The Pakistan Studies teachers mostly force the students to memorize with the help of such visual aids as globe, maps and other illustration. The significance and utility of models are universally acknowledged. The latest approach of using teaching models is generally considered not only to increase student's performance in the examinations but also help in improving their attitude towards the subject. The results of the study are of theoretical and practical significance which may be helpful in creating fresh knowledge of teaching effectiveness.

The results of this study might provide indigenous knowledge about the overall relative effectiveness of these models namely, transmitter knowledge model and inductive inquiry model. The study results thus might contribute to theory and practice of teaching not only at the class and school levels but might also be helpful for curriculum developers to design the appropriate methodology to teach the curriculum content. These results might also be helpful in revising the teacher education programmes that provide relevant knowledge and skill to be pupil teachers for teaching the subject of social studies at secondary level.

Educators are recommending their use to improve learning of students especially for those students whose learning is based on rote memorization of the learning material. This approach is used very commonly in our content. In order to popularize and apply these models of teaching, systematic research at various levels of education for different students and in different subjects in imperative and obligatory.

The educational planners, managers, supervisors, experts and teachers may benefit from the findings of this study in order to raise the quality of teaching Pakistan Studies at secondary level.

The study results may also indicate the future research direction on further testing on these models at primary and higher education level either in isolation or in combination with interpersonal model of teaching has given by Sprinthall and Sprinthall.

1.6 METHODOLOGY

Method of this experimental study is described below:

1.6.1 Population

The population of the study consisted of all students of 10th class studying in all Govt. High Schools located in Rawalpindi city.

1.6.2 Sample

The study sample consisted of 90 students out of 256 students of 10th class studying in Govt. High School D.A.V. (Deo Anand Vernacular) College Road Rawalpindi who were assigned to two experimental groups and one control group. Each group consisted of thirty subjects equated on the variable of pretest academic

achievement through matching. In order to select the sample, pretest was given to all the 256 students of 10th class. The marks obtained by them were arranged in descending order. The students of equivalent pretest scores were identified. Each of them was assigned to one of the three groups. The same procedure was adopted till each group contained 30 students. These three groups were randomly named as experimental group one, experimental group two and control group.

1.6.3 Research Instrument

In order to measure academic achievement of the sample in the subject of Pakistan Studies before and after the experiment, an achievement test was designed. All the 50 items of the test consisted of multiple choice questions (Appendix “A”). The instruments’ content, validity was ensured by preparing the table of specifications and constructing test items. The reliability of the test was found out on a sample of 20 students, 10 each from two schools namely Govt. Abbasi High School Affandi Colony, Rawalpindi and Govt. High School Milad Nagar, Dhoke Ratta Rawalpindi. The reliability coefficient was found out through Kuder Richardson Formula.

1.6.4 Material

The material used in the study consisted of lesson plans (sample lesson plans are given at Appendix ‘B’, ‘C’ & ‘D’) which were developed separately on each topic according to the teaching model(s) to be used during the treatment. The topics covered during the experiments were Establishment of Pakistan, Constitution of Islamic Republic of Pakistan, Education, and Culture of Pakistan. The Lesson Plans were developed in the light of Hunter’s seven Lesson Planning Steps. (Sprint Hall, 1990)

1.6.5 Experiment

The design of the study was pretest posttest control group design which is a type of the true experimental designs. This design is schematically described as below:

R	O ₁	T ₁	O ₂
R	O ₃	T ₂	O ₄
R	O ₅	—	O ₆

(Gay, 1996, P.365)

Where R for “random assignment of subjects to groups”,

O for “Pre test, Post test ”,

T for “treatment”.

After exposing the experimental groups to the treatment of teaching models while providing conventional teaching experiences to the control group, posttest was administered. The independent variable in the study was models of teaching (Transmitter of knowledge model, inductive inquiry model, versus conventional teaching) and the dependent variable in the study was students’ academic achievement.

1.6.6 Procedure

The procedure of the study consisted of following sequential steps:

1. The researcher contacted the Principal of the Institution selected for conducting the experiment in the Rawalpindi City.
2. The Pak Studies teacher of 10th class was contacted for necessary class rooms and seating arrangements for the experiment.

3. The pretest was administered on students in order to obtain their pretest scores. Their pretest scores were arranged in descending order and the students of the sample were allotted to three comparison groups through matching. The groups were randomly assigned to one control and two experimental groups.
4. The pretest results were preserved for the purpose of data analysis.
5. The control group was taught by the researcher herself in the traditional way.
6. The researcher herself provided the treatment to the experimental groups.
7. The supervisor guided the experimenter in the application of the transmitter of knowledge and inductive inquiry models in the class room.
8. The researcher herself also learnt to use the teaching models with the help of books and videos.
9. The duration of the experiment was spread over eight weeks.
10. On the final day of the experiment, the posttest was administered.

1.7 DATA ANALYSIS

The data was analyzed through such descriptive statistics as mean, SD and inferential statistics such as an analysis of variance technique, Scheffe Test and Tuckey's Test in order to test the study hypothesis. The level of significance to be used in study was 0.05.

1.8 OPERATIONAL DEFINITIONS

The operational definition used in this study are given below:

1.8.1 Academic Achievement of Students

Academic achievement of students is operationally defined as the scores obtained by the students on the posttest used in the study.

1.8.2 Advance Organizer

The term “advance organizer”, as used in this study refers to short introductory statement presented to the students at the commencement of a lesson to enable them to understand the basic idea of the lesson to be taught before going into the details of the lesson (Siddiqui and Khan, 1991).

1.8.3 Content Validity

Content validity of pre and post achievement test is operationally defined as measured and verified through preparing the test by table of specification and approval of the test by Pakistan Studies teachers.

1.8.4 Effectiveness

The term “effectiveness” refers here to the extent to which a model produced better results in the terms of the student academic achievement.

1.8.5 Reliability

Reliability of pre and post achievement test is operationally defined as measured in quantitative form through use of Kuder Richardson formula.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter provides the conceptual framework for the study titled as “A Comparison of the Effectiveness of use of Transmitter of Knowledge and Inductive Inquiry Models on students Academic Achievement”. It reviews the literature pertaining to learning, teaching, teaching skills or techniques, methods of teaching and models of teaching with special reference to the subject of social / Pakistan studies. The previous research, more or less related to the topic of this study, is also reviewed to derive conclusions that served as a basis for discussion of the results of this study.

2.1 WHAT IS LEARNING?

Learning, according to behavioral psychologists, is a relatively permanent change in behavior due to experience. On the other hand, cognitive psychologists propose that learning is a relatively permanent change in mental associations due to experience. How are these two definitions similar? How are they different? In two ways, these definitions are similar. Firstly, learning is a relatively permanent change, something that tends to last for a period of time. Secondly, the change is due to experience; but there is also a difference between these two definitions of learning. Behavioural psychologists describe learning a change in behaviour whereas the cognitive psychologist describes it as a change in mental associations. Some learning theories, especially those within the behaviourist perspective, focus on how people’s behaviour changes over time due to the environmental conditions that brings about such changes. Other learning theories, especially those within the cognitive

perspective, focus more on such internal mental processes or thinking rather than on observable behaviours. (Ormrod, 1998)

A problem encountered while studying ‘thinking’ is that we can never actually see thought processes. For instance, we cannot directly observe such things as “remembering” “paying attention” or “studying”. All we can observe is people’s behaviour; we can see what they do and hear what they say. But changes in knowledge, thinking and understanding underlying behavior are as real as changes in behavior itself.

During the first half of the 20th century, many psychologists adhered to the behaviorist perspective, especially in the United States. In 1920, some psychologists argued that we cannot completely understand learning unless we consider the thought processes behind it. For example, theorists in Europe, Piaget in Switzerland, Vygotsky in Russia and a group of German theorists known as Gestalt psychologists focused heavily on the role of thinking processes as they devised their theories of learning and cognitive development. One American psychologist (Tolman as cited by Ormrod, 1998) conducted numerous experiments during the 1930s and 1940s to demonstrate that even the behavior of laboratory rats can best be explained by talking about mental processes.

During the 1960s, many research studies became increasingly cognitive in nature shifting attention away from a detailed analysis of stimuli and responses and focusing more extensively on the nature of the thought processes that occur as people learn new knowledge and skills; a perspective known as cognitive psychology (e.g. Neisser, 1967) soon emerged. Cognitive psychologists propose that by observing people’s responses to various stimuli, it is possible to draw inferences to make

educated guesses about the internal mental events that logically underlie those responses.

Much of cognitive psychology focuses on how people think about and mentally process the information they receive. Accordingly, it is often referred to as information processing theory. Another prominent element of many cognitive learning theories is the notion that learning involves a process of constructing knowledge, rather than of simply absorbing it from the outside world (e.g. Bransford Franks, 1971; Neisser, 1967; Putnam, 1992). In this regard, Piaget proposed that children construct their own body of knowledge about the world on the basis of the experiences they have with it. Vygotsky described how a child can work jointly with an adult to devise a means of tackling a difficult task.

As early as the 1940s, psychologists held that people can acquire new ways of behaving simply by watching and imitating the responses that others make (Miller and Dollard as cited by Ormrod, 1998). This idea of modeling provided the impetus for yet another perspective of learning, one that considers how people learn from observing those around them. Originally referred to as social learning theory, this perspective has increasingly incorporated cognitive processes into its explanation of learning. It is now most commonly called social cognitive theory. According to social cognitive theorists, learning itself occurs at the time that observation takes place even without doing anything and getting anything but performance requires some incentive or self motivation.

2.2 PRINCIPLES OF LEARNING

The principles, or laws, of learning were first stated by Edward Thorndike as cited by Sprinthall and Sprinthall (1990). He said that there are three principles – since that time, three other principles have been added.

The detail description of principles of learning is given below:

2.2.1 Readiness

Readiness implies a degree of single mindedness and eagerness. Individuals learn best when they are physically, mentally, and emotionally ready to learn, and they do not learn well if they see no reason for learning. Getting students ready to learn, creating interest by showing the value of the subject matter, and providing continuous mental or physical challenge, is usually the instructor's responsibility. If students have a strong purpose, a clear objective, and a definite reason for learning something, they make more progress than if they lack motivation. When students are ready to learn, they meet the instructor at least halfway, and this simplifies the instructor's job.

Since learning is an active process, students must have adequate rest, health, and physical ability. Under certain circumstances, the instructor can do little, if anything, to inspire in students a readiness to learn. Basic needs of students must be satisfied before they are ready or capable of learning. Students who are exhausted or in ill health obviously cannot learn much. If outside responsibilities, interests, or worries weigh too heavily on their minds, if their schedules are overcrowded, or if their personal problems seem insoluble, students may have little interest in learning.

2.2.2 Exercise

The principle of exercise states that those things most often repeated are best remembered. It is basis of drill and practice. It has been proven that students learn best and retain information longer when they have meaningful practice and repetition. The key here is that the practice must be meaningful. It is clear that practice leads to improvement only when it is followed by positive feedback.

The human memory is fallible. The mind can rarely retain, evaluate, and apply new concepts or practices after a single exposure. Students do not learn complex tasks in a single session. They learn by applying what they have been told and shown. Every time practice occurs, learning continues. These include students recall, review and summary, and manual drill and physical applications. All of these serve to create learning habits. The instructor must repeat important items of subject matter at reasonable intervals, and provide opportunities for students to practice while making sure that this process is directed toward a goal.

2.2.3 Affect

The principle of affect is based on the emotional reaction of the student. It has a direct relationship to motivation. The principle of affect is that learning is strengthened when accompanied by a pleasant or satisfying feeling, and that learning is weakened when associated with an unpleasant feeling. The student will strive to continue doing what provides a pleasant effect to continue learning. Positive reinforcement is more apt to lead to success and motivate the learner, so the instructor should recognize and commend improvement. Whatever the learning situation, it should contain elements that affect the students positively and give them a feeling of satisfaction. Therefore, instructors should be cautious about using punishment in the classroom.

One of the important obligations of the instructor is to set up the learning situation in such a manner that each trainee will be able to see evidence of progress and achieve some degree of success. Experiences that produce feelings of defeat, frustration, anger, confusion, or futility are unpleasant for the student. If, for example, an instructor attempts to teach advanced concepts on the initial engagement, the student is likely to feel inferior and be frustrated. Impressing upon students the

difficulty of a task to be learned can make the teaching task difficult. Usually it is better to tell students that a problem or task, although difficult, is within their capability to understand or perform. Every learning experience does not have to be entirely successful, nor does the student have to master each lesson completely. However, every learning experience should contain elements that leave the student with some good feelings. A student's chance of success is definitely increased if the learning experience is a pleasant one.

2.2.4 Primacy

Primacy, the state of being first, often creates a strong, almost unshakable, impression. Things learned first create a strong impression in the mind that is difficult to erase. For the instructor, this means that what is taught must be right the first time. For the student, it means that learning must be right. "Un-teaching" wrong first impressions is harder than teaching them right the first time. If, for example, a student learns a faulty technique, the instructor will have a difficult task correcting bad habits and "re-teaching" correct ones.

The student's first experience should be positive, functional, and lay the foundation for all that is to follow. What the student learns must be procedurally correct and applied the very first time. The instructor must present subject matter in a logical order, step by step, making sure the students have already learned the preceding step. If the task is learned in isolation, it is not initially applied to the overall performance, or if it must be relearned, the process can be confusing and time consuming. Preparing and following a lesson plan facilitates delivery of the subject matter correctly the first time.

2.2.5 Recency

The principle of recency states that things most recently learned are best remembered. Conversely, the further a student is removed time wise from a new fact or understanding, the more difficult it is to remember. For example, it is fairly easy to recall a telephone number dialed a few minutes ago, but it is usually impossible to recall a new number dialed last week. The closer the training or learning time is to the time of actual need to apply the training, the more apt the learner will be to perform successfully.

Information acquired last generally is remembered best; frequent review and summarization help fix in the mind the material covered. Instructors recognize the principle of recency when they carefully plan a summary for a lesson or learning situation. The instructor repeats, restates, or reemphasizes important points at the end of a lesson to help the student remember them. The principle of recency often determines the sequence of lectures within a course of instruction.

2.2.6 Intensity

The more intense the material taught, the more likely it will be retained. A sharp, clear, vivid, dramatic, or exciting learning experience teaches more than a routine or boring experience. The principle of intensity implies that a student will learn more from the real thing than from a substitute. For example, a student can get more understanding and appreciation of a movie by watching it than by reading the script. Likewise, a student is likely to gain greater understanding of tasks by performing them rather than merely reading about them. The more immediate and dramatic the learning is to a real situation, the more impressive the learning is upon the student. Real world applications that integrate procedures and tasks that students are capable of learning will make a vivid impression on them.

In contrast to practical instruction, the classroom imposes limitations on the amount of realism that can be brought into teaching. The instructor needs to use imagination in approaching reality as closely as possible. Classroom instruction can benefit from a wide variety of instructional aids, to improve realism, motivate learning, and challenge students. Instructors should emphasize important points of instruction with gestures, showmanship, and voice. Demonstrations, skits and role playing do much to increase the learning experience of students. Examples, analogies, and personal experiences also make learning come to life. Instructors should make full use of the senses (hearing, sight, touch, taste, smell, balance, rhythm, depth perception, and others).

Bruner (1987) theory has four major principles motivation, structure, sequence, and reinforcement. Bruner first principle motivation specifies the condition that predisposed an individual to learn. Bruner's principle is the belief that almost all children have a built in will to learn. However Bruner has discarded the notion of reinforcement. He believes that reinforcement or external reward may be important for initiating certain action for making sure they are repeated. He insists however that it is only through intrinsic motivation that the will to learn is sustained. Bruner is far more concerned with intrinsic motivation than with what he believes to be the more transitory effects of external motivation.

Structure: Bruner second principle states that any given subject area any body of knowledge can be organized in some optimal fashion so that it can be transmitted to and understood by almost any student. If appropriately structured an idea or problem, or body of knowledge can be presented in a simple way. So that any particular learner can understand it in a recognizable form. This is not only to say that all of the nuances of Einstein theory of relativity can be fully mastered by a six years

old child. It does mean however that properly structured Einstein general position could be understood by the child and that under questioning the child could convey to Physicist a recognizable account of the theory.

Sequence: Bruner's third principle sequence states that the extent to which a student finds it difficult to master a given subject depends largely on the sequence in which the material is presented in Bruner's third principle. Teaching involves leading the learner through a certain sequence of the various aspects of the subject. Since Bruner believes that intellectual development is innately sequential, moving from enactive through iconic to symbolic representative, he feels it is highly probable that this is also the best sequence for any subject to take.

Reinforcement: Bruner's fourth principle is that learning requires reinforcement. In order to achieve mastery of a problem, we must receive feedback as to how we are doing. The timing of the reinforcement is crucial to success in learning. The results must be learned at the very time a student is evaluating his or her own performance. If the results are known too soon, the learner will become confused and his or her explorations will be stifled. If they are known too late, the learner may have gone beyond the point at which the knowledge would have been helpful, and by this time the child may have incorporated false information. The teacher's role is indeed sensitive. If the learner has gone to incorporate false information, this must be unlearned in order to get learner back on the right track.

The above perspectives on principles of learning, though different in explaining learning have led Ormrod (1998) to derive following principles of learning:

1. The specific experiences that people have affect what they know and what they can do.

2. People's interpretations of their experiences influence the specific things they learn from those experiences.
3. New learning builds upon prior learning.
4. Motivation affects what and how much people learn.
5. The consequences that follow people's behaviors affect their future learning and behavior.
6. There is considerable diversity in what different people learn from any single experience.

These principles are an important part of both approaches to learning presented earlier. Teachers should create classroom experiences that will maximize students' information and learning of the skills. To put the effects of cognitive processes in general terms, people's interpretations of an experience influence the specific knowledge and behaviors they learn from it. Teachers must also remember that in the same situation, students may interpret those experiences differently.

2.3 WHAT IS TEACHING?

Teaching is an art and a skill to be learnt. It requires the knowledge of subject content, method, techniques and teaching aids to be used for making teaching interesting and effective. This, in fact, is the main objective of education towards which the pupils are to be helped to grow socially, intellectually and emotionally too. For this purpose, the teachers need a variety of teaching approaches (Singh, 2005).

Teaching, as conventionally understood by a traditional teacher, is just the act of disseminating information to the learner in the classroom. It is, generally, equated with telling. If we observe traditional classroom teaching, we find that either the

teacher is delivering information or one of the students is reading from the text book and other students are silently following him in their own text books.

In the last fifty years, a number of research studies have been conducted on teaching-learning process. New methods and techniques have been developed on the basis of research findings. The traditional methods and techniques are being replaced by new methods and techniques in the last two decades in western countries. The traditional explanation of the term 'teaching' which equates teaching with telling is not acceptable to the educators of today, because the recent studies in the field of psychology of teaching and learning have thrown light on some new concepts of teaching. The old concept of teaching as giving off information is being discarded.

According to the changed concept, teaching is to cause the child to learn and acquire the desired knowledge, skills and also desirable ways of living in the society. The main aim of teaching is to help the child to respond to his environment in an effective way. Burton, as cited by Singh (2005), has given a very precise but comprehensive definition of teaching: "Teaching is the stimulation, guidance, direction and encouragement of learning". Stimulation means to cause motivation in learner to learn new things. It is to create an urge to learn. Direction means that teaching is not a haphazard activity but it is a goal directed activity which leads to pre-determined behavior. Direction also means that the activities of the learner in teaching are directed and controlled, keeping into consideration the economy of time and efficiency of learning. Guidance means to guide the learner to develop his capabilities, skills, attitude and knowledge to the maximum for adequate adjustment in the external environment and encouragement of learning means to encourage the learner to acquire maximum learning.

Teaching may consist of a description of those acts that teachers demonstrate which reflect their commitment to a particular philosophy of education. Psychologists and educators have explained it from different angles. Some of the explanations are as follows:

1. Teaching is communication between two or more persons, who influence each other by their ideas and learn something in the process of interaction.
2. Teaching is to fill in the mind of the learner by information and knowledge of facts for future use.
3. Teaching is a process in which learner, teacher, curriculum and other variables are organized in a systematic way to attain some pre-determined goal.
4. Teaching is to cause motivation to learn.

Gage, as cited by Singh, (2005) considers that the process of teaching and learning must be adapted to each other so as to make whatever combination of procedures pay off best. Thus learning is essential for teaching and the learning structures should be considered for effective teaching.

2.4 CONDITIONS OF TEACHING AND LEARNING PROCESS

Gage as cited by Singh, (2005) believes that learning cannot be explained comprehensively with the help of learning theories alone. He assumes that simple behaviour requires some pre-requisites. There is a continuum of learning conditions and behaviour. Teaching acts are also on a continuum from memory to reflective level. It means that memory level is the pre-requisite for understanding level of teaching. He has defined the term teaching as follows:

Teaching means arranging conditions of learning.

According to Singh (2005), Gage explains varieties of learning as follows:

1. Signal learning
2. Stimulus response learning
3. Chain learning
4. Verbal association
5. Discrimination learning
6. Concept learning
7. Rule learning
8. Problem-solving.

Gilbert and Mechner, as cited by Singh (2005), emphasize on three structures:

1. Chain structure
2. Multiple discrimination, and
3. Concept structure

Davies (1972) recognizes five basic learning structures. Out of eight classes of Gagne's learning conditions, these are useful and meaningful to the teacher.

1. Signal structure
2. Chain structure
3. Multiple discrimination structure
4. Concept structure and
5. Principle structure

Gagne's hierarchy of learning makes it possible to relate learning situations to teaching activities.

2.4.1 Signal Learning Structure

A signal involves a specific response, verbal or motor, to a specific stimulus. Teaching for learning signals involve the following simple tactics:

1. Establishing contiguity in stimulus and response (close proximity).

2. Constant practice and rehearsal of stimulus and response connection.
3. Reinforcing the correct response by its confirmation whereas wrong response is ignored.

2.4.2 Chain Learning Structure

What is acquired in a chain of two or more stimulus-response connections is the chain learning. Teaching-learning chains involve establishing contiguity between successive links. Three types of teaching tactics can be used:

- i. Progressive Chaining.** In this type, the chain starts from first chain and then second and so on till the end mastery behaviour, e.g., linear programming.
- ii. Retrogressive Chaining.** It is a backward chain starting with the last act (mastery behaviour) and then moving retrogressively towards first act at the end, e.g., mathematics,
- iii. Rote Learning.** The chain can be learnt by rote memory, e.g., reciting a poem.

2.4.3 Multiple Discrimination Learning Structure

It is based upon the prerequisite of signal and chain structures. It distinguishes one category of phenomenon from another (Underwood, 1964). The teaching learning of multiple discrimination involves following two tactics:

i. Distinctive Conditions

Both stimuli and response must be made as distinctive as possible.

ii. Simultaneous Presentation

All conditions should be presented together at the same time that force student to discriminate.

2.4.4 Concept Learning Structure

The learner acquires a capability of making a common response to a class of stimuli that may differ from each other widely in physical appearance. Following are the tactics:

i. Generalize within the Class

The student should be presented with a set of related but different stimuli, to each of which he makes some response.

ii. Discriminate between Classes

The student should learn to discriminate between the concept and all other concepts.

2.4.5 Principle Learning Structure

A principle is a chain of two or more concepts. Its function is to control behavior. Tactics are as follows:

i. Recalling the Concepts

The concepts should be made as distinctive as possible and student should recall the concepts required for making the principle.

ii. Chaining the Concepts

The concepts should be chained together after recalling them.

2.5 LEVELS OF TEACHING LEARNING PROCESS

There are four levels of teaching-learning process and these are given below in detail:

1. Autonomous Level of Teaching – Learning.

2. Memory Level of Teaching – Learning.
3. Understanding Level of Teaching – Learning.
4. Reflective Level

2.5.1 Autonomous Level

This level of teaching learning believes that human beings are inherently active. They generate ideas from within themselves. Education should not be imposed by outside agent but, on the other hand, it should be child-centered. The teacher should promote each student's heightened intuitive awareness of himself by creating an appropriate environment in which students can realize three basic human awarenesses which are: 1) Choosing agent, 2) Free agent, and 3) Responsible agent.

In this type of teaching, the role of the teachers is more negative than positive in the sense that there is leadership, direction, prescription or imposition on student thought. Students are permitted, even encouraged, to live close to nature so that they may indulge freely in their natural feelings.

2.5.2 Memory Level

This type of teaching seems to be based either on mental discipline theory which emphasizes the importance of vigorous exercise for the development of mental faculties or S-R conditioning theory of learning in which bondage is formed between the stimuli and responses without involving any purpose. Cognitive field psychologists explained this phenomenon in a different way. They say that if anything is learnt, it involves insight but the insight involved in memory learning has no significant relationship to the material being studied.

2.5.3 Understanding Level

This level conveys different meanings as, for example, to perceive the meaning or grasp the idea or to comprehend, to be thoroughly familiar with or to apprehend the character or nature of, to comprehend the meanings of words as a language, to clearly grasp as a fact or realize.

- a) understanding as seeing relationship
- b) understanding the use of a fact
- c) understanding as such

2.5.4 Reflective Level

Reflective level of teaching learning involves the process of problem solving. Cognitive – field psychology, which defines learning as gaining of new insights or understanding or changing old ones by structuring and restructuring of life space, has made a valuable contribution in the process of problem solving.

2.6 PRINCIPLES OF TEACHING

Teaching is an art and the teacher is an artist. As the artist is governed by certain scientific principles, which help him acquire proficiency in his profession, so a teacher is also governed by certain principles, which help him acquire proficiency in teaching. The material (students) of the teacher is living beings whom he has to shape according to some principles. The teacher must know to develop mental characteristics of children at different age levels so that he can take the advantage of the interest and motivation of the students in a learning task. Following are some of the important principles of teaching:

1. Using the experience already acquired.
2. Knowledge and skills are for use.

3. To provide for individual differences.
4. Principle of readiness.
5. Objectives of the lesson should be specifically defined.
6. The teacher should follow the psychological principles which have been developed by great educators. The important principles are:
 - i. Proceed from simple to complex
 - ii. Proceed from concrete to abstract
 - iii. Proceed from general to particular
 - iv. Proceed from known to unknown
 - v. Proceed from induction to deduction or vice-versa
 - vi. Arrange for frequent reinforcement. (Singh, 2005)

2.7 TECHNIQUES OF TEACHING

Walberg (1986) identified seven skills or techniques of teaching on the basis of his meta – analysis.

2.7.1 Academic Learning Time

Academic learning time in the classroom emerged as an important variable. Important as academic learning time is, there is not an exact relationship between time on task and learning outcomes. Moreover, it is difficult, if not impossible, to measure what is going on in a student's mind at a specific moment. In fact, one study showed that students who appeared to be paying attention (engaged in academic learning time) were actually thinking about nonacademic issues. Students soon learn the importance of putting on a good face in order to protect their privacy. As a result of these and other factors, it is an important necessary condition but far from the whole

story. Basically academic achievement is moderately affected by the efficient use of time.

2.7.2 Use of Reinforcement

By far, the single most significant discrete instructional variable is the use of positive reinforcement. The careful and consistent use of this Skinnerian techniques, both verbal and non-verbal, has positive effect upon student learning.

2.7.3 Cues and Feedback

To some extent, the use of cues and feedback is related to the process of questioning. A second component of effective cueing is sometimes called wait time, which gives the student some time to think about the question. By providing time and then helping a student elaborate an answer, the teacher will increase academic achievement and decrease anxiety. Providing constructive feedback is another part of this strategy. Feedback improves academic achievement. When teachers merely collect assignments and then either say nothing or simply make a check mark, an opportunity for growth has been missed. The same is true for homework. In fact, Walberg found that graded homework with comments was 50 percent more effective than homework by itself. Constructive feedback obviously provides the students with information on which to build learning.

2.7.4 Cooperative Learning

The effectiveness of cooperative learning is an interesting finding. The main point here is its importance in the classroom of employing small group techniques with cooperative objectives. Such a procedure encourages student participation and

also results in improved academic performance. Basically such an approach requires a blend of techniques, and it is not really a single technique.

2.7.5 Classroom Morale

This is another process that, like cooperative learning, is not strictly one teaching strategy. Still, it is important not to lose sight of the fact that classroom atmosphere obviously has a significant impact on learning. This isn't to say that a kind of happy-go-lucky, do your own thing, laissez-faire atmosphere is appropriate. That would be as bad as the other extreme. An authoritarian, teacher-controlled classroom, feelings of cohesiveness, satisfaction, goal direction, and student perceptions of a friendly atmosphere make a positive difference in learning. These findings were cross-validated by a research which found that one main element of effective teaching is the need to create a relatively relaxed learning environment with a task oriented focus.

2.7.6 Higher Order Questions

Since teacher questioning has an unusually long history, examining its use as a strategy is clearly important. Generally, how the questions are posed obviously makes a difference. A higher order question is basically a query that requires the student to analyze and produce a reasoned response, not repetition of the teacher's words. In other words, there is not an already prescribed factual answer to the question. Asking a student to name the year of the Columbus expedition is clearly a lower order question. Asking the student to explain why Columbus was able to convince the monarchy of a country different from his own to support his voyage calls for greater intellectual work, and thus it qualifies as a higher order question.

Recently, there has been a remarkable upsurge in the "teaching of thinking". Such a process, which involves logical analysis and argumentation principles is most

encouraged by higher order questioning. Thus, an idea that had lost favor in the 1970s – namely, to distinguish between the lower and higher order questions – has returned as a result of newer research evidence and a general interest in formal instruction designed to promote “thinking” (Sprinthall, 1990).

One of the continuing problems in the research on classroom questioning, however, is the problem of wait-time. Perhaps the effectiveness of higher order questions, in particular, is determined not so much by their actual frequency but how much time is provided for them. Students obviously need reflection time to process a complex question.

2.7.7 Advance Organizers

This skill involves the use of the deductive approach. The student is told in advance what the main point or the main concept is to be covered. On the one hand, such advance organizers have been shown to help students focus attention on the key points. On the other hand, the effect is positive but not particularly strong. In all probability, then, an advance organizer is a good method to get a class geared in. Since some learners need a clear road map of the main points in a lesson in advance, the method should not be ignored.

According to Sprinthall and Sprinthall (1990), one of the weaknesses of such a massive meta analysis of Walberg is that the results cannot depict actual pattern of teaching. The analysis of instruction developed by Flanders shows how the above techniques or elements fit together in actual classroom interaction. Flanders pattern of teaching serves as a bridge between Walberg’s techniques of teaching and models of teaching to be reviewed in this chapter later on. Flanders categories provide a scientific basis for the art of teaching rather than examining one technique of teaching

at a time as given by Walberg. These categories of teaching behavior are given in table 1:

Table 1: Categories for Flanders interaction analysis

TEACHER TALK	INDIRECT INFLUENCE	1	Accepts feelings: Accepts and clarifies the tone of feelings of the students in an unthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.
		2	Praises or encourages: Praises or encourages student action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head and saying “um hm?” or “go on” are included.
		3	Accepts or uses ideas of students: Clarifies, builds, or develops ideas suggested by a student. As teacher brings more of his or her own ideas into play, shift to # 5.
		4	Asks questions: Asks a question about content or procedure with the intent that the student answer.
	DIRECT INFLUENCE	5	Lecturing: Gives facts or opinions about content or procedure; expresses his or her own ideas, asking rhetorical questions.
		6	Giving directions: Gives directions, commands, or orders that students are expected to comply with.
		7	Criticizing or justifying authority: Give statements intended to change student behavior from unacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he or she is doing; extreme self-reference.

Gage grouped the system into two broad categories: indirect teaching, types 1, 2, 3 and 4, and direct teaching types 5, 6 and 7. That the main difference between the two modes is basically whether teaching is viewed as asking questions or giving directions and lecturing. In comparing the modes, Gage also wanted to examine possible differences according to grade level, elementary versus secondary. He found

clear evidence that teachers who employed the indirect mode at the secondary level produced greater academic gains among their pupils than teachers who used the direct mode. This means that the academic performance of teenage students will be enhanced through the effective use of questioning and open inquiry. At the high school level, effectiveness is increased if the teacher uses the indirect mode more than half the time. Obviously, there will be times for giving careful directions, praising and criticizing students for misbehavior; yet for the most part employing the other modes of questioning, reinforcing, cueing and responding to feelings will produce academic gains to a greater degree.

To further buttress this approach to teaching and learning, researchers conducted a series of independent studies at the college level. Although actual Flander's system was not used, the overall results were quite similar. The college researchers found that professors who provide time for student questions, allow students to question each other and encourage students to make statement in class fostered cognitive growth and greater complexity of thinking on the part of their students. So, results from both high school and college studies indicate the advantage of the indirect mode with older students. Piaget's work showed that during adolescence, students can develop greater capabilities for abstract reasoning and greater independence in thinking than earlier in their development. This is probably a main factor favoring the indirect teaching mode. At the elementary level, Gage's review yielded somewhat different results. He found less of a relation between the indirect modes and pupil learning. There were some positive outcomes in the indirect mode but also many in the direct mode. More recent research, especially at the elementary level, seems to indicate that the more direct teaching can be quite significant in producing student achievement. For example, in elementary school

instruction in both reading and mathematics, the teacher directed instruction yielded stronger gains. Direct methods in math may be necessary to teach the rudiments of the number system. The effective elementary teacher needs to ask questions, praise, build on ideas and respond to student feelings. However, the elementary teacher may well use the direct methods more than half the time. The careful use of advance organizers and a low level of ambiguity provide younger students with helpful guidance for learning. However, teaching skills can be combined into methods and models of teaching. (Sprinthall and Sprinthall , 1990)

2.8 WHAT IS MODEL OF TEACHING?

In teaching, the use of models is very old. Socrates, the Greek philosopher, used his own model of question-answer (Dialect). Indian ancient teachers developed their own models of teaching to affect the desirable changes in the behavior of the learner. Several models of teaching have been developed in the last few decades in western countries. There is no one particular model that can help the pupils to grow in all respects-social, intellectual, emotional. For this, Joyce and Weil (1985) have identified a variety of strategies developed by different learning theorists and designed a number of models of teaching. These innovations have been found to be very effective. Several models of teaching have been developed which prescribe different approaches to instructional process to bring desired changes in the behavior of the learners.

Models of teaching have been developed to help a teacher improve his capacity to reach more children and create a richer and more diverse environment for them. A model of teaching has been defined in various ways of (Singh, 2005).

According to Shahid (2000), “Model of teaching can be defined as instructional design which describes the process of specifying and producing

particular environmental situation that cause the students to interact in such a way that a specific change occurs in their behaviour”.

A model of teaching basically represents a specific cluster of strategies designed to reach a particular type of learning outcome with pupils in the best way. However, no single model represents the best way to reach all types of learning. Instead, overall teaching effectiveness will depend on, firstly, teacher’s ability to master specific techniques and secondly, to combine them within a particular model and finally on his ability to use a variety of model flexibly (Sprinthall & Sprinthall, 1999).

A model of teaching is a plane of pattern that can be used to shape curricula, to design instructional material and to guide instruction in the classroom and other settings. The most important aim of any model of teaching is to improve the instructional effectiveness in an interactive atmosphere and to improve or shape the curriculum (Siddique & Khan, 1991).

A teaching model is a comprehensive approach to teaching that typically derives from a theory of education and encompasses key assumptions about what students should learn and how they learn. Sometimes, instructional models have been extensively researched. In other cases, relatively little is known about their actual effectiveness. Models stress certain instructional functions and require teachers to be trained in particular ways. Some models are compatible with other models, some are apt to extol their virtues. It is reasonable to assume that no model is universally appropriate. Each possesses its own strengths and weaknesses” (Shahid, 2000).

Joyce and Weil have searched a variety of strategies developed by different learning theorists and designed a number of models of teaching that are briefly described here as families of models:

2.9 ELEMENTS OF A MODEL

A model has the following elements:

- i. A focus
- ii. A syntax
- iii. A social system
- iv. A support system

i. Focus

A focus of a system refers to the frame of reference around which the model is developed. It is the main thesis which determines combinations, and relationship of processes, conditions and factors built into the model. Objectives of teaching and aspects of the environment, generally, constitute the focus of the model. What is aimed to be achieved is found to be the focus of most of the models. Focus is the central aspect of a teaching model.

ii. Syntax

The second element, syntax or phasing of the model, refers to the description of the model in action, i.e., the kind of activities which are organized at well-defined stages of the whole programme, typify the educational environment belonging to each model. It is the sequence of steps involved in the organization of the complete program of teaching.

iii. Social System

The third element is the social system which refers to two elements: students and teacher roles, particularly, hierarchical relationship or authority relationships and norms or the student behavior which is rewarded. Social system is an important element of every model. Specific learning are very much controlled by the kinds of

relationship that are structured during the process of teaching. Models of teaching prescribe system for teaching of attitudes, skills and understandings etc.

iv. Support System

The last and the most important aspect of a model is the support system which means to provide facilities to teacher and the student to successfully implement the strategy of teaching. For example, if we want to implement individualization, we have to provide a number of audio-visual aids, teaching machines, programmed texts etc, to cater to the needs of individual learner (Shahid, 2000).

2.10 CHARACTERISTICS OF A MODEL OF TEACHING

According to Singh (2005), all good models of teaching have some common identifiable characteristics which are as follows:

2.10.1 Scientific Procedure

A model of teaching is not a haphazard combination of facts but, on the other hand, it is a systematic procedure to modify the behavior of learners. They are based on certain assumptions.

2.10.2 Specification of Learning Outcomes

Models of teaching specify the learning outcomes in detail on observable student's performance. What the student will perform after completing an instructional sequence is specified in detail.

2.10.3 Specification of the Environment

This means that every model of teaching specifies in definite terms the environmental conditions under which a student's response should be observed.

2.10.4 Criterion of Performance

A model specifies the criteria of acceptable performance which is expected from the students. The model of teaching delineates the behavioral outcomes which the learner would demonstrate after completing specific instructional sequence.

2.10.5 Specification of Operations

All models of teaching specify mechanisms that provide for students reaction and interaction with the environment.

2.11 FUNCTIONS OF A MODEL OF TEACHING

Models of teaching have the following functions:

2.11.1 Guidance

A model of teaching serves a useful purpose of providing in definite terms what the teacher has to do. He has a comprehensive design of instruction with him through which he can achieve the objectives of the course. Teaching becomes a scientific, controlled and goal directed activity. Thus a model provides guidance to the teacher as well as to the students to reach the goal of instruction.

2.11.2 Developing Curriculum

A model of teaching helps in the development of curriculum for different classes at different levels of education.

2.11.3 Specification of Instructional Material

A model of teaching specifies in detail the different types of instructional materials which are to be used by the teacher to bring desirable changes in the personality of the learners.

2.11.4 Improvement in Teaching

A model helps the teaching-learning process and improves effectiveness of teaching (Singh, 2005).

2.12 ASSUMPTIONS OF MODELS OF TEACHING

Models of teaching have been evolved on the following assumptions:

- i. Teaching is the creation of appropriate environment. There are various component parts of the teaching environment which are interdependent.
- ii. Content, skill, instructional roles, social relationships, types of activities, physical facilities and their use, all form an environmental system whose parts interact with each other to constrain the behavior of all participants, teachers as well as students.
- iii. Different combinations of these elements create different types of environment and elicit different outcomes.
- iv. Models of teaching create environment. They provide rough specification for environment in the classroom teaching learning process. (Singh, 2005)

2.13 FAMILIES OF MODELS

1. Information processing models
2. Social interaction models
3. Personal models
4. Behaviour modification models

2.13.1 Information Processing Models

Information Processing Models share an orientation toward the information processing capability of pupils and the ways that they can improve their ability to master the information. These refer to the way people handle stimuli from the

environment, organize data, sense problems, generate concepts and solution to problems and employ verbal and non verbal symbols. Some information processing models are concerned with the ability of the learner to solve problems and thus emphasize productive thinking. A large number of these emphasize on concepts and information derived from the academic disciplines. Thus, the information processing models contain:

1. Concept attainment
2. Inductive thinking
3. Inquiry training
4. Advance organizer
5. Memory
6. Cognitive growth

2.13.2 Social Interaction models

These models emphasize on the relationship of the individual to society and the other persons. Models from this orientation give priority to the improvement of the individual ability to relate to others, to engage in democratic processes and work productively in the society. Thus, a social interaction model contains:

1. Group investigation
2. Role playing
3. Jurisprudential inquiry
4. Social stimulation

2.13.3 Personal Models

These models share orientation towards the individual and the development of selfhood. It is expected that the focus on helping individuals to develop a productive

relationship with the environment and to view themselves as capable persons will produce richer interpersonal relations.

2.13.4 Behavioural Modification Models

These models have evolved from an attempt to develop efficient systems for sequencing learning task and shaping behaviour by manipulating reinforcement. Slanner and others as cited by Singh (2005) have developed these models and operate conditioning as their central mechanism. They are frequently referred to as behavioral modification theorists because they emphasize changing the external behavioral of the learner and describe them in terms of visible behaviour rather than the underlying behaviour.

2.14 IMPORTANT MODELS OF TEACHING

There are some important models of teachings that have been experimented upon in some of colleges of Indian University under the N.C.E.R.T, New Delhi, These are as under:

1. Advance organizer model.
2. Inquiry training model
3. Mastery learning model
4. Glasser's model
5. Carroll's model
6. Jesuit model
7. concept attainment model
8. Jurisprudential inquiry model
9. Synectics model

2.14.1 Advance Organizer Model

In this model, the teacher provides an advance organizer and he provides a set of hangpins termed as “intellectual scaffolding”, a structure on which the learner can hang the ideas and facts, which they would be presented during their lesson. The teacher uses the advance organizer that students already knew. Expository model has been most frequently used in teaching not only today but has occupied the central focus right from the inception of formal teaching. Lecturing is prevalent in classroom teaching. The books and reading material also follow predominantly expository presentation of the learning task. That is why it has attracted the attention of theorists and research workers. Obviously for the improvement of effectiveness, expository presentation approach is to be improved.

David Ausubel Theory of Meaningful Learning provides substantial material for what has been termed as Expository Teaching Model (ETM). The model purports to equip the teacher to convey information meaningfully by goals of schooling. The teacher plays the role of a lecturer or explainer. The lecture is to be organized in a way that pupils internalize the knowledge of particular subject matter at any given time and the way it is organized. This objective is achieved through strengthening the cognitive structure of the learner. Cognitive structure implies “a person’s knowledge of particular subject matter at any given time and the way it is organized”. The available structure is the foremost factor governing whether new material is potentially meaningful or not and how well it will be acquired and retained. So, it is desirable to increase the stability and clarity of pupils’ prior knowledge before presenting the new one. It facilitates their acquisition and retention of new information. The implication is that we must relate and reconcile what we know with what we are learning.

2.14.2 Mastery Learning Model (MLM)

Bloom's mastery learning model demonstrated that classes suffer from under achievement and through appropriate teaching strategies, practically all students can be helped to achieve the desired mastery level. The deteriorating achievement of children in almost all the content areas frustrate everybody related to it which reduces teacher's aspirations and pupils desire for further learning. It systematically destroys the ego and self concept of students who are logically required to attend school eight to ten years under conditions which are systematically frustrating and humiliating. This results in development of negative self concept and attitude in child's life. Besides, it exposes the enormous wastage of resources invested in education. Keeping all this in view, it is thought that a Mastery Learning Model must be developed and teacher in the class must ensure the mastery of each concept at each stage.

The objectives of this model include:

1. To enable each pupil to work at his own rate through units of study in a learning sequence.
2. To develop in each pupil a demonstrable degree of mastery.
3. To develop in themselves initiation and self direction of learning.
4. To foster the development of problem solving through process.
5. To encourage self evaluation and motivation for learning.

2.14.3 Inquiry Training Model

Suchman as cited by Singh, (2005) has propounded this model and he has tried to make it popular. His basic philosophy behind the model was:

1. Pupils inquire naturally when they are puzzled.

2. They can be conscious of and learn to analyze their thinking strategies.
3. New strategies can be taught directly and added to pupils.
4. Co-operative inquiry helps pupils to learn about the tentative, emergent nature of knowledge and to appreciate alternative explanation.

The children by nature are explorers. They are energetic adventurer. They enjoy inquiry exploration and adventure to satisfy their curiosity. During the process, they develop inquiry skills vigorously. But it is now believed that through systematic inquiry training, these skills can be refined and improved. So, the general goal of inquiry training is to help pupils develop intellectual skills, to raise questions concerning the problem for finding out answers. Suchman provides a systematic structure within which the pupils have to ask questions regarding why events happen in the way they do, to collect data and process it logically to arrive at plausible cause effect relationships. The inquiry training begins by presenting a puzzling event, a problem or a phenomenon when pupils encounter such a situation; they are motivated to solve the puzzle. Such situations can be used to teach systematic procedures inquiry.

The pupils are helped to develop an attitude that all knowledge is tentative. Scholars generate theories and explanations. No one pushes them aside. There are no permanent answers to questions. We can always be more sophisticated in our explanations and most problems are amendable to several equally plausible explanations. They should also be aware that other people's point of view enriches our own thinking.

In Inquiry Training Model, induction encounter is the pre-requisite without which no problem can be posed. Any learning can take place by the learners after inquiring into the problem.

2.14.4 Concept Attainment Model

Bruner, Jacqueline Goorow and George Austine developed the Concept Attainment Model of Teaching in 1956. The model emerged out of the study of thinking process in human beings; it is based on the assertion that environment is full of tremendously diverse things and would have been impossible to adjust in it if human beings had not been endowed with the capacity to discriminate and to categorize things in groups. This process of classifying things in groups, benefits human beings in three ways. First, it reduces the complexity of the environment, second, it gives the means by which we identify the objects in the world and third, it reduces the necessity of constant learning.

Bruner and associates devoted their major work to the description of a process by which we discriminate the attributes of things, people and events and place them into categories. According to Bruner, concept formation leads to concept attainment. In concept attainment, there is only one concept. Using clues supplied by the teacher, students try to determine the identity and definition of that concept. Bruner categorizes the concept attainment model as follows:

1. Reception model of concept attainment.
2. Selection model of concept attainment.
3. Unorganized material model of concept attainment.

2.14.4.1 Applicability of the model

1. The concept attainment model of teaching is widely used in language teaching. Language learning can be viewed as concept attainment in as much as the society has already devised categories of things and labels for those categories.

2. Teaching of grammar or the syntactic structure of every language is done through teaching the concept of that language.
3. The fundamentals of mathematics are taught through concept attainment model.
4. Concept attainment model of teaching can be used in all disciplines. It can be the basis of extensive man-machine systems in modern teaching learning process.

2.14.5 Glasser's Model

This model was given by Robert Glasser (1962) which was named as Basic Teaching Model. It consists of four major components: Instructional Objectives, entering behaviour, Instructional Procedure and Performance Assessment with feed back links.

Instructional objectives are those abilities that the students should attain after completion of segment of instruction. A teacher is supposed to make useful statement of instructional objectives on the basis of classes of behaviour given by Baloom, (1956) and Gagne, (1965). The basic contention is that a useful statement of instructional objectives refers to observable human performance of student behaviour. The next step is to determine the entering behaviour of the students which is to regard as the level on which further teaching will be based. Entering behaviour is sets of learning abilities and learning styles. Although this model gives priority to the selection of instructional objectives and the assessment of entering behavior, in practice these two components must interact.

2.14.6 Carroll's Model

This model was given by John Carroll as cited by Singh, (2005). Carroll describes most of the components of his teaching model in term of time. He is of the

opinion that the realization of educational objectives depends upon the time span of the learner to learn the task. So we can call it *Time Count Model*. The model has five components out of which three pertain to the entering behavior and to instructional procedures. According to Carroll, students with high aptitudes require less learning time than those with low aptitude. Perseverance is the amount of time the student is willing to spend for learning the objective of instruction. The ability to comprehend is the general intelligence of the students. The greater the general intelligence, the less will be the time required by the student to attain the instructional objectives. Two components of Carroll model, the opportunity to learn and the quality of instruction refers to the instructional procedure. Instructional procedure is the third but main component of this model. The teacher designs the instructional procedure in such a way that the objectives are realized and learning take place.

In the fourth phase of performance assessment, the teacher evaluates the results of instructional procedure. For this purpose, he used different tools. This model is called basic teaching model because it provides simple and uncomplicated, fairly exact, conceptualization of the teaching process.

2.14.7 Jesuit Model

Brudy as cited by Singh, (2005) describes the Jesuit as Masters of Methods for organizing materials, methods and teachers into uniformly affective instructional systems. According to Brudy, the most important aspect of Jesuit teaching was the method for securing overlapping review. Review of the perfection and other task followed immediately upon completion of their work. The Jesuit built performance assessment intimately into their systems. The standard of achievement was the mastery of the material and its retention for longer period.

2.14.8 Jurisprudential Inquiry Model (JIM)

The model is based on a conception of society in which people differ in their views and priorities and in which their social values legitimately conflict with one another. Resolving complex and controversial issues within the context of productive social order requires citizens who can talk to one another and successfully negotiate their differences. The basic model include six phases: 1) Orientation to the case, 2) Identifying the issues, 3) Taking position, 4) Exploring the stances underlying the position taken 5) Refining and qualifying position, 6) Testing assumption of facts, definitions, and consequences.

2.14.9 Synetics Model

Synetics is interesting new approach to the development of the creativity, designed by Gordon and his associates. Gordon's initial work with Synetics was to develop creativity groups within the industrial organizations, that is, groups of person trained to work together to function as problem solvers or product developers. Gordon based Synetics on four ideals that challenge conventional views about creativity, 1) Creativity is important in everyday activity, 2) The creative process is not at all mysterious, it can be described and it is possible to train persons directly to increase their creativity, 3) creative invention is similar in all fields, individuals and groups generate ideas and products in much the same fashion.

2.15 EFFECTIVENESS OF DIRECT INSTRUCTIONAL MODEL

According to Sprinthall and Sprinthall (1990), as a result of meta analysis of teaching, there has been a growing tendency to view effective instruction as synonymous with direct instruction. The center at institute for research on teaching at Michigan State, in particular, has generated large numbers of studies supporting the

contention that gains in academic achievement are often associated with this method. Essentially, direct instruction is highly structured. The teacher presents the material in small steps, uses advance organizers, checks for understanding, has students answer turn by turn in an ordered fashion, and provides immediate feedback on their answers. Furthermore, the teacher accomplishes all this at a brisk and business like pace. By implication, the teacher should spend very little time, if any, on other methods, such as inductive or discovery teaching. Some research seems to support the idea that effective teaching is a sequence of carefully and constantly modified actions. In fact, the current claim is that the direct method is appropriate for all subjects at all grade level. In the words of one of the major researchers in this area Jere Brophy.

According to Brophy (1988), if we take into account both (a) knowledge and skills taught because they are considered important in their own right and (b) knowledge and skills taught because they are prerequisite to accomplishment of higher level objectives, we can say that the principles derived from process outcome research will apply to most of what is taught in school.

Finally, the current claim is that not only will academic achievement improve across to board but also affective and personal development will be promoted.

According to Sprinthall and Sprinthall (1990), in assessing the validity of these conclusions, it is important to understand the many limitations. The main research base has been elementary school classrooms rather than secondary schools. Further, the research has been limited to a few specific subject areas at an introductory level, and there was no attempt to involve a true cross section of school types for example, urban, rural, high and low socioeconomic status, majority and minority. Thus, doubt can be cast upon the claim of generalization. Finally, the greatest problem is that effective teaching cannot ever simply reach the point of

prescribing a single set of teacher behaviors good for all pupils, for all subjects, and for all time.

As a result the direct method represents only a partial picture of the teaching process, and we caution against some of the current generalizations. Certainly, we agree with both Larry Cuban's critique and Lee Schulman's (1986), much more moderate views calling for a broader conception. In fact, Schulman's view is that the direct model is already waning. The research tried to focus on one variable at a time as if it were possible to freeze teaching frame by frame. Teaching is too interactive and involves a synthesis of many variables rather than success with just a single variable. "There was little evidence that any observed teacher had ever performed in the classroom congruent with the collective pattern in the composite." Also, follow up showed that not all of the trained behaviors continued to correlate with achievement gains, that some of the experimental teachers did not always use the prescribed pattern, and that not all the prescribed behaviors were necessary for improved achievement. In other words, a fine grained analysis of the claims could not support the contentions of the direct school of teaching. The final and perhaps most telling point was the complete absence of theory to explain the findings. A fair conclusion is that direct or active teaching does provide some but not all the answers to the complex problems of teacher effectiveness.

Sprinthall and Sprinthall reduced family of models and above teaching models into three models.

- i. Transmitter of knowledge model
- ii. Inductive inquiry model
- iii. Interpersonal learning model

2.16 TRANSMITTER OF KNOWLEDGE MODEL

According to Sprinthall and Sprinthall (1990), probably the most common teaching model, and certainly the one with the longest tradition, is that which views teaching as the transmission of knowledge. This view assumes that there exists a well known and finite body of knowledge from which the teacher selects certain facts and concepts to pass on to pupils. This model emphasizes the need to give pupils basic facts and information before they can be expected to think for themselves. They must learn what is already known before they can come up with any new ideas that might fit in with the existing knowledge. It assumes that learning new information is essentially in linear step-by-step sequence. The teachers' expertise is needed to arrange both the content material to be mastered and the method of presentation. Probably, the most obvious distinguishing characteristics of this model is the high degree of structure employed.

Several approaches to teaching through the 1960's to 1970's were based on a transmission model of teaching and learning. The view was of a teacher with authority who disseminates knowledge largely through lectures and verbal exchanges; knowledge is an entity that exists and can be transferred to students; learning is based on the accretion and retention of presented information and skill (Biddle, 1997).

In this model, the teacher uses advance organizers. At the outset of a lesson, the teacher presents the pupils with the general rule, the generalization or the main 'point' of the activity. For example, a social studies unit might start with, "Today we are going to study about the origins of civilizations, the early settlements on the banks of two rivers in the Middle East. Thus, at the outset, the goal of the lesson is described at a generalizable, conceptual level learning about the origins of civilization. This technique helps the students tune in immediately to the overall objective. It creates at

least theoretically a set of expectations that are clear and explicit. The pupils are ready. Immediately following the presentation of the generalized idea, the teacher then changes the level of abstraction to concrete examples. The rule or principle stated at the outset creates a readiness in the pupils. Their cognitive attention is focused. The concrete examples help them understand the connections between the facts and the general point. Thus, in the social studies example, the teacher would now present a series of concrete facts and examples. For many thousands of years, tribes would wander from place to place; food was gathered as it grew naturally. As the seasons changed, the tribes would pick up and move on, seeking less hostile climates. These examples would set the stage for the understanding of the generalized idea. The teacher would proceed to a presentation of a long series of facts (Sprinthall and Sprinthall, 1990).

It includes providing the general rules, correlations and then asking students to apply these to solve problems. This is the most common teaching, where a lecturer represents the principles of the subject, followed by a tutorial where the students practice the application of the knowledge they are taught. For a crash course or to transmit large chunks of information, this technique would be more suitable. The technique provides a sequence of instruction that can be applied to solve a problem. This model in extreme, becomes a set of boring monotonous lectures followed by tutorials. Also the students are asked to derive corollaries from the given facts and principles. (Rao and Reddy, 1992)

The presentation of examples, finally, is followed by the restatement of the generalized principle. In this sense, the transmission of knowledge model is often called guided discovery. But the researcher is of the view that guided discovery and unguided discovery both come under Bruner's inquiry model to be described later

because, according to Prince, (2002) and Felder in enquiry based learning also known as guided enquiry, students are presented with a challenge and accomplish the desired learning in the process of responding to that challenge. Through various examples, all pupils are led to the same generalization. Probably the strongest example of his model of transmitting information is the lecture format. Although it can be used with other teaching strategies, this model is most effectively used as a format for lectures or for mini lectures. This model is based on deductive teaching.

Deductive teaching (also called direct instruction) is much less constructivist and is based on the idea that a highly structured presentation of content creates optimal learning for students. The instructor, using a deductive approach, typically presents a general concept by first defining it and then providing examples or illustrations that demonstrate the idea. Examples that do not fit the idea are helpful in confirming the idea. Students are given opportunities to practice, with instructor guidance and feedback, applying and finding examples of the concept at hand, until they achieve concept mastery (Landmark College, 2005).

According to Sprinthall and Sprinthall (1990). The strongest example of this model of transmitting information is the lecture format. Although it can be used with other teaching strategies, this model is most effectively used as a format for lectures or for mini lectures. If we recall our experience as a student, we will readily remember instances of hopelessly disorganized lectures, that did not follow this model. Look back at our own notes, or the lack of them, from these lectures. We may find a few random comments in our own writing, lots of questions and false starts, perhaps even a scribbled memo to ourselves.

But what the point of today's lectures? He cannot seem to make up his mind where is it all going? He must have eighteen hands on the one hand this, on the other hand that I hope the period ends soon.

The effective use of advance organizers and teacher led instruction also requires much attention to maintaining pupil activity. If teachers are not careful, then pupil passivity can increase markedly for some students, particularly the low achievers one study found that low achievers did not understand the directions, spent most of their time watching their peers speed through the assignment, turned in, incomplete work, and were frequently criticized. Such a cycle was repeated, often to the distress of both the student and the teacher. Also it is clear that some students will do better under learning conditions that are less teacher directed and controlled.

Some educators have suggested that deductive teaching can be critically important for students with learning disabilities (Brigham and Matins, 1999). This method has a clear and readily apparent structure, is easily paced to accommodate student needs and is very familiar to students. But deductive teaching has a trade off. It can be too rigid a form that does not allow for divergent student thinking nor emphasize student reasoning and problem solving.

The transmitter of knowledge model can be more efficient by means of improving the organization of course content and introducing simulation such as mystery simulation. In fact that in a book of chemical reaction engineering presenting a murder mystery to be solved using the principles of reaction engineering, presenting a murder mystery to be solved using the principles of reaction engineering. (Fogler, 1999)

Transmitter of knowledge model is also called deductive model, advance organizer model, mastery learning model and direct instructional model.

Thus the transmission of knowledge model, through the use of advance organizers, can provide a clear and systematic approach to teaching. One of the disadvantages of the model is that so much of the work of learning is controlled and directed by the teacher. One study found that low achievers did not understand the directions, spent most of their time watching their peers, speed through the assignments, turned incomplete work and were frequently criticized. It is clear that some students will do better under learning conditions that are fewer teachers directed and controlled (Sprinthall and Sprinthall, 1990).

2.16.1 SALIENT FEATURES OF TRANSMITTER OF KNOWLEDGE MODEL

2.16.1.1 Advance organizer

In model one the teacher uses the advance organizer. At the outset of the lesson, the teacher presents the students with the general rule, the generalization or the main point of the activity. To enable the to understand the main theme of the lesson before going into the details of the study, or lesson. Advance organizer in a good method to get a class glued in, since some learners need a clear road map of the main points in a lesson in a advance. Following is example advance organized activities provided at the beginning of a lesson. Discussing the importance of the constitution before describing the main features of the objectives resolution. At this stage learning material is presented through lectures, films, scripts, discussions, experiences, extra reading material is organized in logical order. Attempts are made to maintain motivation and interest. (Asubel, 1978)

2.16.1.2 Lecturing and reviewing

Lecturing is appropriate for communicating a large amount of material to many students in a short period of time. The teacher can integrate information from many sources in less time than it would take for the students to integrate all the information themselves. Lecturing is a good method for introducing a new topic, giving background information, and motivating students to learn more on their own. Lecturing also helps students learn to listen accurately and critically and gives the teacher a chance to make on the spot changes to help students understand when they are confused (Gilstrap & Martin, 1975; Kinds-vatter, Wilen, & Ishler, 1988). Lectures are therefore most appropriate for cognitive and affective objectives at the lower levels of the taxonomy like knowledge, comprehension and application;.

Daily review and checking emphasizes the relationship between lessons so that students remember previous knowledge and see new knowledge as a logical extension of content already mastered. It provided students with a sense of wholeness and continuity assuring them that what was to follow was not isolated knowledge unrelated to past lessons (Borich, 1999).

2.16.1.3 Presentation / modeling

Modeling is a teaching activity that in values demonstrating to learners what you want them to do (in the form of action sequences), say (in the form of facts and concepts), or think (in the form of problem solving or learning to learn strategies. Modeling is particularly effective for younger learners who may not be able to follow complex verbal explanation, visually dominant learners who may need to see how something is done before they can actually do it. Bandura and his colleagues have studies how and why we learn from models (Bandura, 1977, 1986, Zimmerman,

1989). Their research on modeling is referred to as social learning theory, and attempts to explain how people learn from observing other people. From their work we know that children not only can learn attitudes, values, and standards of behavior from observing adults and peers, but may also learn physical and intellectual skills. For example, learners acquire certain values about the importance of learning, caring for others, doing work neatly or respect for other cultures by observing how their parents, friends, and teachers actually behave in the real world, and then inferring from their observations how they, too should behave. Although teachers model all the time, we know some forms of modeling are better than others.

Zimmerman and Kleefeld (1977) found that teachers who were taught the practice of modeling were far more effective at helping young children to learn than teachers who were not.

Modeling is direct teaching activity that allows students to imitate from demonstration or infer from observation the behavior to be learned.

2.16.1.4 Guided practice

In this segment of the lesson, students use new skills and knowledge under direct teacher supervision. During guided practice teachers ask many questions. Teachers use student responses as a way to check for understanding and evaluate progress. They offer prompts and provide corrective feedback to ensure the accuracy of student answering at a rate of approximately 70 to 80 percent accuracy (Mandeville, 1992).

Corrective and Feedback:

Correct answers to questions should be acknowledged clearly so that students' answers are hesitant, the teacher provides process feedback. Inaccurate responses should be corrected immediately, before errors become habitual.

Frequent errors are a sign that students are not ready for independent work, and guided practice should continue (Gersten and Keating, 1987).

2.16.1.5 Independent practice

Independent practice provides the opportunity in a carefully controlled and organized environment to make a meaningful whole out of the bits and pieces. Facts and rules must come together under your guidance and examples in ways that (1) force simultaneous consideration of all the individual units of problems and (2) connect the units into a single harmonious sequence of action (LO Berge & Samuels, 1974).

The purpose of providing opportunities for all types of independent practice is to develop automatic responses in students, so they not longer need to recall each individual unit of content but can use all the units simultaneously. The goal is to schedule sufficient opportunities for independent practice to allow individual responses to become compared and automatic (Samuels, 1981).

2.17 INDUCTIVE INQUIRY MODEL

Another common teaching model, according to Sprinthall and Sprinthall, that came into vogue in the 1960's suggests that the teacher's role is to reveal or unveil the fundamental structure of a discipline. The idea is to teach concepts or the process of inquiry, not facts. In this model, the teacher focuses on the concepts of fractions and divisions so that the pupils understand that cross multiplying is really dividing both sides of an equation by a common number. Similarly, in a social studies class, pupils are no longer asked to memorize the principal cities and products of a state. Rather, they might be given a blank map showing topographical features such as hills, mountains, valleys, rivers and lakes and then be asked to figure out where cities might

be located. In other words, they go through an inquiry process that helps them understand why big cities grow in certain locations. By the use of this model, teacher produces mini-scholars in the various disciplines.

Inductive teaching is a powerful strategy for engaging all learners in a structured lesson. The process is described here, and main questions that you will need to consider are raised as prompts through which a model lesson can be developed.

The students do the learning. However we teach. We design the environment to make it likely that the students will learn. We organize the kids, assemble learning resources, and provide tasks. We teach the students to work in that organization, use those resources (including ourselves), and respond to those tasks. We draw on various models of teaching to help us design those environments, to help us decide how to organize the student, how to arrange materials, and what kinds of tasks to provide and in what order. Always we have objectives in mind: the kinds of learning that we hope will happen.

The inductive model is designed to accomplish some very broad purposes, but can be focused specifically as well. Some of the broader objectives occur over fairly long period of time through many experiences with inductive processes: others can be accomplished quite quickly and efficiently (Sprinthall and Sprinthall, 1990).

According to this model, the sheer intellectual excitement of discovering the reasons behind events, for example, the logic a historian or a mathematician actually uses motivates the pupils to further activity and exploration. Teaching and learning resemble an archaeologist's uncovering of one fragment after another of some mysterious object. The archaeologist's curiosity about the fragments naturally makes

him or her want to make sense of the puzzle; this curiosity produces both activity and excitement.

The discovery method of teaching is based on this model. In discovery learning, students are confronted with the challenge and left to work out the solution of their own (Bruner, 1961, French'2006). The teacher, by analyzing material and asking questions, but not by giving answers, spurs the pupils to learn by helping them discover the answer.

There are a variety of specific methods that enhance discovery learning such as the inductive strategy of Hilda Taba, the inquiry training method of Richard Suchman, and the scientific inquiry technique of Joseph Schwab. These models are related to John Dewey's original project method, which emphasized the process of inquiry rather than content acquisition as central to learning. In each case, the teacher arranges material i.e., open ended in order to stimulate the process of asking questions and exploration by the pupils. It is, of course, possible to overemphasize learning by discovery. It can be exasperating to never have any of four questions answered. It is not necessary to discover everything for your self in order to learn the most important. However, it is difficult to know, especially at the elementary level and in junior high, exactly how much the pupils genuinely understand about the structure of a discipline taught in this way. The idea of the structure is itself abstract and therefore, beyond the comprehension of the concrete stage of thinking in which most of the children are. To understand such concepts and such processes, substantial cognitive sophistication is necessary.

Inductive enquiry as defined here is a thought process where one is made to conclude some generalization from a number of facts, events, objects or process. It is a technique in which a teacher presents a set of data or a situation and then asks the

students to derive a conclusion. This technique requires more thinking on the part of students in order to find pattern in the data set. This model is designed to reduce the communication gap between the teacher and the students to develop critical thinking. Of course, the model to be used depends on the nature of the discipline and the resources available. Most of the time, this model requires a lot more time and effort. (Landmark College, 2005)

Inquiry, which strongly emerged from the proliferation of new social studies projects in the late sixties and early seventies, has been riding on a high crest in social studies education in USA. Social studies not only borrowed the concepts, generalizations and value concepts from the social sciences, it also borrowed the methodology of the social sciences (Van Tassel, 1986). As such, inquiry is viewed as a methodological framework of the new social studies.

There is a semantic confusion associated with ‘inquiry’. For the sake of clarification, inquiry should be considered a general process by which human beings seek information or understanding. In other words, inquiry is a way of thought. “Scientific inquiry, a subset of general inquiry, is concerned with the natural world and guided by certain beliefs and assumptions”. (Welch et al., 1981).

The inquiry approach, the heart of new social studies, involves three groups of objectives: attitudes and values, a mode of inquiry involving objectives. In a general sense, inquiry and discovery are interchangeably used in the literature. There are numerous interpretations of the inquiry or discovery approach. They range from belief in total discovery in which the teacher acts as a stimulator and facilitator, to a directed discussion in which the discussion becomes more teacher oriented and the students receive cues regarding the path of inquiry being pursued (Fenton, 1967).

Inquiry teaching is a multifaceted, omnibus term, and at present there is little consensus among theorists as to what comprises inquiry teaching. Despite this difficulty, inquiry has been widely used in various national and international projects in social studies. A large volume of literature is available on inquiry as a strategy though research evidence is scanty, fragmentary and to a large extent, inconclusive.

Traugh (1978) compiled data on teacher's comprehension of inquiry methodology, behavior with students and belief about classroom conduct. Follow up interviews resulted in the following information:

1. The degree of impact on teachers of the inquiry movement is varied.
2. Most teachers recognize the term "inquiry", can define it, have used it and can make some evaluation of its effectiveness. Inquiry is not used, for the most part, consistently and over long periods of time.
3. Many teachers claim inquiry to be a good method to use with "superior" students but a bad method to use with average or below average students.
4. A misconception held by many teachers is that students must be able to read well in order to inquire. Hence, multimedia materials should be developed.
5. Many teachers are unwilling to put the control of the learning process in the hands of the student.
6. Teachers recognized the following characteristics as contributory to the effectiveness of inquiry teaching:
 - a. Flexibility
 - b. Broad knowledge base.
 - c. Organizational skills.
 - d. Comfort with being challenged.
 - e. Good listening skills.

- f. Accepting that teachers can learn from students.
- g. Encouraging students to share ideas.

Project SPAN (Fancett and Hawke, 1982) reports, however, that teachers tend not to be social inquirers themselves. When innovative practices are implemented in social studies classrooms, it is not a reflection of usual patterns of classroom strategies. Thus, there seems to be a discrepancy between attitudes and research findings about inquiry and the attention given to it in the classroom.

2.17.1 SALIENT FEATURES OF INDUCTIVE INQUIRY MODEL

John Dewey described the basic inquiry learning format in 1910. There have been many adaptations of this strategy, but the form usually includes the following elements (Pasch, Sparks-Langer, Garnder, Starko, & Moody, 1991):

- i. The teacher presents a puzzling event, question, or problem.
- ii. The students formulate guesses to explain the event or solve the problem
- iii. Collect data to test the guesses
- iv. Draw conclusions
- v. Reflect on the original problem and on the thinking processes needed to solve it.

At times, teachers present a problem and students ask yes / no questions to gather data and test hypotheses. This allows the teacher to monitor students' thinking and guide the process. Here is an example:

1. Teacher presents discrepant event. The teacher provides incomplete information to the students about the causes of separation of East Pakistan. The teacher tells the students to figure out why East Pakistan (Dakha) Fell.
2. Students ask questions from the teacher to gather more information and to isolate relevant variables. Teacher answers only “yes or no”. Students ask of ideology of East Pakistan was different from West Pakistan (no). They ask if Govt. of that time treated Banglies unequally (yes) question. Continue.
3. students test causal relationship. In this case, they ask if lack of national popular leadership created sense of deprivation among the people of East Pakistan (yes). They ask no steps were taken to alleviate the poverty of East Pakistan (yes). Then they test out reason with other material for example separation of Bangal in 1905.
4. Students form a generalization (principle): “East and West Pakistan having no road link, the division of West Pakistan in four provinces that have less population as compared with the single province of East Pakistan. There was also differences of Language spoken in both the wings. In addition to that they were different in their attitude and approach.” Later lesson expand students’ understanding of the principles and reasons through further studies.
5. The teacher leads students in a discussion of their thinking processes. What were important variables (factors)? How did you put the causes and effect together? And so on.

2.18 INTERPERSONAL LEARNING MODEL

The interpersonal model stresses upon development of human relationships between teacher and student instead of learning of facts or discovery of concepts. If the teacher can convey a genuine affection and empathy, a warm, facilitative classroom climate will be created and the pupils will learn in a much a better way. The quality of human interaction, especially the degree to which the teacher treats the pupils with sincerity and honesty is the key to create the best environment for learning. According to Rogers (1969), teaching as deliberate instruction is a vastly overrated function. The educator should, instead, concentrate more attention on creating the conditions that will promote experiential learning. The interpersonal model would include a strong emphasis on Flanders' category one (accepting feelings) as well as on category two (encouraging and praising) and three (using student ideas).

Rogers is convinced that traditional learning is so impersonal, cold and aloof that it goes in one ear and comes out from the other. In his classic work "freedom to learn", Rogers present three necessary and sufficient conditions for the promotion of learning: empathy, unconditional, positive regard and congruence. Empathy permit us to communicate to our students that we in-fact understand the emotions, unconditional positive regard allows us to accept our students for what they are, without passing judgment. Rogers again says that teachers must place no conditions on these relationships and must accept students open-heartedly and without reservation. Congruence means being real and honest. Going through the motions and pretending that we like children or listening to their feelings and emotions half heartedly in not enough. If teachers provide these conditions, then the children will be free to learn.

This model of teaching is primarily concerned with human interaction. This may also be its major drawback.

According to Sprinthall (1990), it cannot necessarily be concluded that teaching and learning can be explained exclusively by the three Rogerian conditions. Love alone is not enough in teaching. Obviously, such facilitating conditions are important and necessary. Interpersonal model cannot be used independently because this model focuses on feelings alone and ignores the content.

2.19 CONVENTIONAL TEACHING

Conventional teaching refers to the long established customs found in schools that societies have traditionally deemed appropriate. Traditional teacher centered methods focus on rote learning and memorization. Conventional education focuses more on teaching than learning. It assumes that for every ounce of teaching, there is an ounce of learning by those who are taught. As a result of conventional teaching, what so ever is taught in classroom settings is forgotten soon, and much or what is remembered is irrelevant. It is simply chalk and talk approach (Robert,2009).

It often leads to passive learning, overly structured and rigid classroom with few opportunities for real world and collaborative learning. (Santrock, 2006, P.398).

Conventional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of instructor (in the form of lectures) and decision maker (in regards to curriculum content and specific outcomes). They regard students as having 'knowledge holes' that need to be filled with information. In short, the conventional teacher views that it is the teacher that causes learning to occur (Novak, 1998).

This is only one way traffic, just the students are listening and the teacher is telling. The classroom discipline is based upon fear. (Koacher, 1986)

2.20 DIFFERENCES AMONG THE TRANSMITTER OF KNOWLEDGE MODEL, INDUCTIVE INQUIRY MODEL & CONVENTIONAL TEACHING

Transmitter of Knowledge Model	Inductive Inquiry Model	Conventional Teaching
1. Teacher directed, (Slavin, 1991)	1. Students Centered (Woolfolk, 1995)	1. Teacher centered. (Novak, 1998)
2. Explicit and systematic teaching. (Bennett, 1982)	2. Teacher presents a set of data or a situation and then asks the students to derive a conclusion (Pasch et al., 1991, p-188)	2. Giving information in a formal way. Students play passive role by listening to the lecture. (Gilstrap & Martin, 1975)
3. Sequenced instruction, structured learning experiences. (Ellis and Fouts, 1997)	3. Teacher gives incomplete information or presents a problem. (Borich, 1999)	3. Mostly, instruction is poorly organized and is in poor logical sequence. Content is not logically coherent and explicit. (Shaheen, 2009)

<p>4. Step by step content and well-paced explanations. (Woolfolk, 1995)</p>	<p>4. This model encourages students to make guesses based on incomplete information and stimulates them to find their own systematic means to solve problems (Bruner, 1978)</p>	<p>4. Presenting all new material at the same moment. (Santrock, 2006)</p>
<p>5. Supervised and independent practice. (Wathins and Stocum, 2004)</p>	<p>5. Teacher draws additional examples from students' own experience and interests. (Borich, 1999).</p>	<p>5. Students are not provided sufficient time to practice skills. (Koacher, 1986)</p>
<p>6. Activities that focus on specific skills, use of A.V aids, conducting learning probes, examples and non-examples. (Cooper, 1999)</p>	<p>6. Teacher presents examples and non-examples of the generalization identifying critical and non-critical attributes. (Woolfolk, 1995)</p>	<p>6. No specification of skills, examples and no check for student understanding. (Shaheen, 2009)</p>
<p>7. Enhances retention, promotes transfer of learning. (Kuder, 1990)</p>	<p>7. Invites students to discover information (Henson, 1996)</p>	<p>7. Heavy emphasis on rote memorization and rote learning. (Engelmann and Carnine, 1991)</p>

8. Ensures direct, frequent measurement of student performance based upon mastery of specific skills, using varied assessments. (Tasks, tests and observations) (Gagne, 1978)	8. Measurement of students performance is based on demonstration of conceptual understanding rather than entirely on whether the final answer is correct. (Borich, 1999)	8. Rare or very few identification of mistakes. (Koacher, 1986)
9. Re-teaching as needed.	9. Inductive Inquiry allows students to learn content and process at the same time. (Kindsvatter, Wilen & Ishler, 1988)	9. More emphasis on covering the curriculum. (Gilstrap & Martin, 1975)
10. Summarizes instruction and highlights main points. (Sprinthall & Sprinthall, 1990)	10. To concludes some generalizations from a number of facts, events, objects or processes. (Borich, 1999)	10. The step of summarizing is not generally involved. (Shaheen, 2009)

2.21 EXPERIMENTAL DESIGN

2.21.1 What is Experiment?

An experiment is a situation in which the relationship between cause and effect is determined. The underlying logic being, “if two situations are alike in every respect and if one element is added to one but not to the other, the resultant difference may be considered to be the effect of the element added. Similarly, if two situations

are alike in every respect and one element is removed from one situation but not from the other, any observable difference may be attributed to the element removed (Bukhari, 2000).

2.21.2 Threats to Experimental Validity

According to Gay (2000) any uncontrolled extraneous variable effecting performance on the dependent variable are threats to the validity of an experiment. An experiment is valid if results obtained are only due to the manipulated independent variable and if they are generalizable to individuals or contents beyond the experimental setting. These two criteria are referred to respectively as the internal validity and external validity of an experiment respectively.

Internal validity is the degree to which observed differences on the dependent variable are a direct result of manipulation of the independent variable, not some other variable. In other words, an examination of an internal validity focuses on threats or rival explanations that influence the outcome of an experimental study but are not due to the independent variable. The degree to which experimental research results are attributable to the independent variable and not to another rival explanation is the degree to which the study is internally valid.

External validity, also called ecological validity, is the degree to which study results are generalizable, or applicable, to groups and environments outside the experimental setting. In other words, an examination of external validity focuses on threats or rival explanations that disallow the results of a study to be generalized to other settings or groups. A study conducted with groups of gifted ninth graders, for example, should produce results that are applicable to other groups of gifted ninth graders. If research results were never generalizable outside the experimental setting then no one could profit from research. An experimental study can contribute to

educational theory or practice only if its results and effects are replicable and generalize to other places and groups. If results cannot be replicated in other settings by other researchers, the study has low external, or ecological, validity.

2.21.3 Threats to Internal Validity

The most authoritative source on experimental design and threats to experimental validity is the work of Donald Campbell, in collaboration with Julian Stanley and Thomas Cook. They identified eight main threats to internal validity: history, maturation, testing, instrumentation, statistical regression, differential selection of participants, mortality and selection-maturation interaction.

The experimenter can overcome these threats. The use of random selection of participants, the researchers' assignment of participants to treatments, and control of other variables are powerful approaches to overcoming the threats.

All internal threats are summarized as given below:-

Threat	Description
History	Unexpected event occur between the pre and posttest, affecting the dependent variable.
Maturation	Changes occur in the participants, from growing older, wiser, more experienced etc during the study.
Testing	Testing a pretest alters the results of the posttest.
Instrumentation	The measuring instrument is changed between pre and post testing, or a single measuring instrument is unreliable.
Statistical regression	Extremely high and extremely low scores tend to the mean on retesting.
Differential selection of Participants	Participants in the experimental characteristics that affect the dependent variable differently.

Mortality	Different participants drop out of the study in different numbers altering composition of the treatment groups.
Selection – maturation interaction	The participants selected into treatment groups have different maturation rates. Selection interaction also occurs with history and instrumentation.

2.21.4 Threats to External Validity

Several major threats to external validity can limit generalization of experimental results to other populations. Building on the work of Campbell and Stanly, Bracht and Glass refined and expanded discussion of threats to external validity and classified these threats into two categories. Threats affecting “generalizing to whom” – that is, threat affecting the groups to which research results be generalized – make up threats to population validity. Threats affecting “generalizing to what” – that is, threats affecting the settings, conditions, variables, and contexts to which results can be generalized – make up threats to ecological validity.

THREAT	DESCRIPTION
Pretest treatment interaction	The pretest sensitizes participants to aspects of the treatment and thus influences posttest scores.
Selection treatment interaction	The nonrandom or volunteer selection of participants limits the generalizability of the study.

Multiple treatment interference	When participants receive more than one treatment, the effect of prior treatment can affect or interact with later treatment, limiting generalizability.
Specificity of variables	Poorly operationalized variables make it difficult to identify the setting and procedures to which the variables can be generalized.
Treatment diffusion	Treatment groups communicate and adopt pieces of each other's treatment, altering the initial status of the treatment's comparison.
Experimenter effects	Conscious or unconscious actions of the researchers affect participants' performance and responses.
Reactive arrangements	The fact of being in a study affects participants so that they act in ways different from their normal behavior. The Hawthorne and John Henry effects are reactive responses to being in a study.

2.21.5 Experimental design

Experimental designs in the blue print of the procedures that enable the researcher to test hypotheses by reaching valid conclusions about relationship between independent and dependent variables. Selection of a particular design is based upon the purposes of the experiment, the type of variables to be manipulated and the conditions or limiting factors under which it is conducted. The design deals with such practical problems as how subjects are to be manipulated and controlled, the way extraneous variables are to be conducted, how observations are to be made and the type of statistical analysis to be employed in interpreting data relationships.

(Bukhari, 2000).

2.21.6 Types of experimental design

Gay (2000) classifies the (group) experimental design into three categories, namely, pre-experimental design, true experimental design and chi experimental design. Each category is further subdividing into a number designs as summarized below:

2.21.6.1 Pre-experimental designs

Pre experimental designs involve only one group. A Pre experimental design does a very good job of controlling extraneous variables that Jeopardize validity.

i. The one shot case study: The one shot case study involves one group which is exposed to a treatment (T) and then post tested (O). All of the sources of invalidity are not relevant; testing for example is not a concern since there is no pretest. Even if the subjects score high on the posttest, we cannot attribute their performance to the treatment since we do not even know what they knew before you administered the treatment. So if we have a choice between using this design and not doing a study do not do the study. (Gay, 2000).

ii. The One group pretest-posttest design: This design involves one group which is pre tested (Q_1) exposed to treatment (T) and post tested (O_2). The success of the treatment is determined by comparing pretest and posttest scores, if subjects do significantly better on the posttest, it cannot be assumed that the improvement is due to the treatment. History and maturation are not controlled; something may happen to the subjects or inside of the subjects to make them perform better the second time. Testing and instrumentation are

not controlled the subjects may learn something on the first test that helps them on the second tester unreliability of the measures may be responsible for apparent improvement. Statistical regression is also not controlled for even if subject are not selected on the basis of extreme scores (High or low) it is possible that a group may do very poorly. Just by poor luck, on the pretest. Subjects may guess badly just by chance on a multiple choice pretest, for example and improve on a posttest simply because their scores based on guessing is more in line with an expected score. Particular if the period between O1 and O2 is long the change may reflect the maturation and experience of the subjects.

iii. The static group comparison: The static group comparison involves at least two groups; one group receives a new or unusual, treatment, the other receives a traditional, usual, treatment and both groups are post tested. The first group is usually referred to as the experimental group, and the second group as the control group. It is more accurate to call both groups comparison groups, since each really serves as the control for the other. Each group receives some from of the independent variables. An experimental group of teachers, for example may receive some type of in service training while the control group of does not. In this case $T_1 = \text{In-service training}$ and $T_2 = \text{no in service training}$. The whole purpose of control group is to indicate what the performance of the experimental group would have been if it has not received the experimental treatment. Of course this purpose is fulfilled only to the degree that the control group is equivalent to the experimental group on other variables. Absent of pretest is major weakness in this design with the result that information lacks as to the equivalence to the experimental and the control

group in the first place.

2.21.6.2 True experimental designs

The true experimental designs control for nearly all sources of internal and external invalidity. All of the true experimental designs have one characteristic in common that none of the other designs has random assignment of subjects to groups. Ideally subjects should be randomly selected and randomly assigned. However to qualify as a true design, at least random assignment must be involved. All the true designs involve a control group, while the posttest only control group design may look like the static group comparison design, random assignment, makes them very different in terms of control. All the true designs involve a control group. While the post tested only control group design may look like the static group comparison design, random assignment makes them very different in terms of control.

i. The pretest – posttest control group design

The above design has been used in the present study. This design involves at least two groups, both of which are formed by random assignments; both groups are administered a pretest of the dependent variable, one group receives a new or unusual treatment and both groups are post tested. Posttest scores are compared to determine the effectiveness of the treatment. The pretest posttest control group design may also be expended to include any number of treatment groups. For three groups, for example, this design would take the following form:

O ₁	T	O ₂
O ₃	T	O ₄
O ₅	-	O ₆

The combination of random assignment and the presence of a pretest and a control group serve to control for all sources of internal invalidity. Random assignment controls for regression and selection factors, the pretest controls for mortality, randomization and the control group control for maturation, and the control group controls for history, testing and instrumentation. Testing for example is controlled because if presenting leads to higher posttest scores, and advantage should be equal for both the experimental and control groups.

The only definite weakness with this design is a possible interaction between the pretest and the treatment which may make the results generalizable only to other pre-tested groups. The seriousness of this potential weakness depends upon such factors as the nature of the pretest, the nature of the treatment and the length of the study. It is more likely to occur with reactive measures such as attitude scales and in short studies. When this design is used, the researcher should assess and report the probability of its occurrence. A researcher might indicate, for example that possible pretest interaction was believed to be minimized by the on reactive nature of the pretest and by the length of study (9 months).

There are three basic ways in which the data can be analyzed in order to determine the effectiveness of the treatment and to test the research hypothesis; one of them is clearly inappropriate, one is not very appropriate, and one is clearly the most appropriate – one approach is to compare the pretest and posttest scores of each group; if the experimental group improves significantly but not the control group, it is concluded that the treatment is effective. This approach is inappropriate because the real question is whether

the experimental group is better than the control group, thus the appropriate comparison is of the posttest scores of each group. If the researcher finds that both groups have improved significantly (e.g. each group's average posttest reading score is significantly higher than its pretest reading score after 9 months of different instruction), this still does not indicate whether one group is significantly better than the other then it would expect both groups to improve their reading in 9 months, so the question involves which treatment has done a better job. A second approach is to compute gain or difference, scores for each subject (posttest score minus pretest scores) and then to compare the average gain of the experimental group with the average gain of the control group. Gain scores entail problems, however. For one thing all students do not have the same room to gain on a 100 items test, who is better, a student who goes from a pretest score of 80 to a posttest score of 70 (a gain of 50).

The third approach, and the one usually recommended is to simply compare the posttest scores of the two groups. (Surprise! The simplest approach is recommended). The pretest is used to see if the groups are essentially the same on the dependent variable. If they are posttest scores can be directly compared using a t test. If they are not (random assignment does not guarantee equality), posttest scores can be analyzed using analysis of covariance.

Recall that covariance adjusts posttest scores for initial differences on any variable, including pretest scores. A variation of the pretest posttest control group design involves random assignments of members of matched pairs to the groups, one member to each group in order to more closely control for one or more extraneous variables. There is really no advantage of this

technique, however, since any variable that can be controlled through matching can be better controlled using other procedures such as analysis of covariance. Another variation of this design involves one or more additional posttest. For example:

R	O ₁	T ₁	O ₂	O ₃
R	O ₄	T ₂	O ₅	O ₆

This variation has advantage of providing information on the effect of the independent variable both immediately following treatment and at a later date. Recall that interaction of time of measurement and treatment effects as a threat to external validity. It is potential threat to generalizability because posttest may yield different results depending upon when it is done a treatment effect (or lack of same) which is found based on the administration of a posttest immediately following the treatment may not be found if a delayed posttest is given sometime after treatment. While the above variation does not completely solve the problem, it does greatly minimize it of course, how many additional posttest should be given and when, depends upon the variables being investigated. Thus this is a strong and a true experimental design but there may be possibility of the influence of the effect of testing and the interaction with the experimental variable.

ii. The posttest only control group design

This design is exactly the same as the pretest posttest control group design except there is no pretest. Subjects are randomly assigned to groups exposed to the independent variable, and post tested. Posttest scores are then compared to determine the effectiveness of the treatment. As with the pretest posttest control group design, the posttest only control group design can be

expanded to include more than two groups. In this design mortality is not controlled for because of the absence of pretest data on subjects. In this case the researcher may report that while mortality is a potential threat to validity with this design, it did not prove to be a threat in his or her particular study since the group size remained constant through out the duration of the study. A variation of the posttest only control group design involves random assignment of members of matched pairs to the groups, one member to each group, in order to more closely control for one or more extraneous variables. As with the pretest posttest control group design however, there is really no advantage to this technique; any variable that can be controlled through matching can better be controlled using other procedures.

iii. The Solomon four group design

The Solomon four group design involves random assignment of subjects to one of four groups. Two of the groups are pre-tested and two are not. One of the pre-tested groups and one of the un-pretested groups receive the experimental treatment. All four groups are post tested. This design is combination of the pretest posttest control group design and the posttest only control group design, each of which has its own source of invalidity (pretest treatment interaction and mortality respectively). The combination of these two designs results in design which controls for pretest treatment interaction and for mortality. The correct way to analyze data resulting from application of this design is to use a 2x2 factorial analysis of variance. The factorial analysis tells the researcher whether there is an interaction between the treatment and the pretest which design is the “best” depends upon the nature of the study.

2.22 REVIEW OF RELATED RESEARCH STUDIES

As the present study sought to compare the effectiveness the deductive transmitter of knowledge model and inductive inquiry model in teaching of SS at Sec level, the available research study relevant to the study problem are reviewed below:

Lackner (1968) investigated that the teaching of two concepts in beginning calculus by combinations of inductive and deductive approaches. The purpose of this study was to determine if different teaching approaches produced differences in learning the limit and the derivative concepts in beginning calculus as measured by a common criterion test. An ordered combination of two teaching approaches the concrete inductive and the abstract deductive concepts. All four possible pairings for the two units were considered and constituted the four experimental treatments. Specifically, the problem in this study was to determine if there were a statistically significant difference in the four treatments. Programmed units were used to control the teacher variable. The units were read by advanced high school mathematics students, who were divided into high and low achievers on the basis of pretest scores. Contrary to the pilot study and related research results, when a difference in teaching methods existed in the derivative and total treatment studies. The deductive method was favored. Further correlation and regression analyses revealed that a students prior mathematical knowledge a measured by the pretest and limit test, was the determining factor in predicting the limit and derivative test scores, even though the deductive treatment was found to be superior.

To determine whether the inductive or deductive teaching method is better able to help college freshman remedial English students make progress in formal grammar and mechanics, in vocabulary and reading comprehension, and in composition, two classes of 23 students were formed into a test sample. One class was

instructed for a semester by a deductive method and the other by an inductive method, and the two classes' mean gain scores on three standardized tests (e.g. "Diagnostic Reading Test (Survey Section)" and the "English Expression Test") were compared using a "t"-test. A group made up of 86 students also taking remedial English furnished the control. It was concluded that (1) remedial English students taught by the inductive method achieved significantly more in the area of vocabulary and reading comprehension than did the other, (2) deductive and inductive methods are equally effective in instructing remedial English students in composition skills, in grammar, and in mechanics, and (3) neither method by itself is superior for use in all language arts instruction areas (Thomas, 1970).

In one controlled study (Mayer and Greeno, 1972), college students were taught the concept of binomial probability. Some students were taught using the inductive method, while others were taught using the deductive method. Both groups received the same basic information and same computational examples-only the sequence varied. Both groups were then given a test that contained four types of problems; 1) ones that were just like those given in the examples; 2) ones that were slightly modified from the example problem; 3) ones that were unanswerable; 4) ones that asked questions about how and when to use the formula. Results of the study indicated that while the deductive group did better on problems that were just like the examples, students in the inductive group did better on the other three types of questions. They were able to apply their knowledge to new situations.

In a research conducted by him, Wiley (1977) writes that a large proportion of the effectiveness research conducted in the social studies falls under the heading of research on instructional methods labeled "critical thinking", "inquiry", and the like.

Most of this research shows no significant differences between critical thinking methods and so-called traditional methods”.

Henkin (1977) investigated the correlation of the Boehm test of basic concept with the reading achievement. Selected factors relating to reading achievement included vocabulary comprehension and composite score, investigated the comparison between normal disadvantaged high risk first grade children on concept attainment and reading achievement and the role of sex upon concept attainment and reading achievement. The sample consisted of 50 1st grade children, Boehm test of basic concept from A, Gate's MacGinite Reading test, student t-test were utilized. Significant differences were found between normal and disadvantaged high risk children in that latter two groups are deficient in concept attainment and reading achievement.

Horak and Zweng, (1978) investigated that two instructional treatments, inductive and deductive teaching methods, and the possible interaction between these treatments and the cognitive style dimension of field dependence independence. The subject matter was transformational geometry and the criterion measures included an examination testing knowledge, application, analysis, and transfer. Subjects were elementary education majors. The results indicate the cognitive style learned more from the inductive method. The field independent students were not significantly affected by the teaching method.

Martorella (1979) found that no conclusion from research has emerged to establish clearly the superiority of inquiry over the traditional approaches. Learning through inquiry is often more enjoyable to the students. Generally speaking, the students are more interested, or more enthusiastic, or just more active in the inquiry process as they are generating more knowledge like a social scientist. Inquiry

teaching seems to have a positive effect on discipline, retention and attitude towards social studies. Research evidence on inquiry as a method of teaching social studies with respect to student achievement is scanty, fragmentary and inconclusive. Indubitably, more research is needed.

Martorella (1979) found that no conclusion from research has emerged to establish clearly the superiority of inquiry over the traditional approaches. Learning through inquiry is often more enjoyable to the students. Generally speaking, the students are more interested, or more enthusiastic, or just more active in the inquiry process as they are generating more knowledge like a social scientist. Inquiry teaching seems to have a positive effect on discipline, retention and attitude towards social studies. Research evidence on inquiry as a method of teaching social studies with respect to student achievement is scanty, fragmentary and inconclusive. Indubitably, more research is needed.

Research concerning the effectiveness of inquiry as compared to the more traditional lecture method has not yet determined the superiority of any method. Tyrell (1982) reviewed 88 comparisons between traditional lecture and discussion methods and noted that 51 percent favored the lecture method and 49 percent favored the discussion method. Subsequently, there was very little difference in achievement scores between either methods. Tyrell also emphasized the following results which may assist the teacher in making his / her choice of strategies:

- i. When appropriately used, the lecture and inquiry discussion methods were relatively equal in providing knowledge acquisition opportunities.
- ii. In one study, the lecture-recitation method was found to be superior in terms of subsequent test scores to inquiry and public issue discussion method. The

effectiveness of the approach, however, depended upon student ability and performance.

- iii. Different strategies may be more appropriate for different abilities.
- iv. Hinrichson and Schaumburg (1975) reported no difference between inquiry and lecture in terms of academics performance.
- v. Schlenker (1970) found that students of inquiry oriented teachers showed a greater fluency in inquiry and critical thinking but showed no difference in content mastery and information retention.
- vi. Very little attention to the actual operation of inquiry in the classroom is reported in the research literature (Denny, 1977). Hence, more practical research is warranted.
- vii. Students' problem solving ability tended to improve when teachers taught the required skills and explicitly explained what was expected of them. These students' problem solving skills were clearly superior to those students whose teacher acted mainly as a discussion controller rather than an instructor (Whitehead, 1979).
- viii. Inquiry techniques are successful in providing illustrative examples, clarifying themes, sustaining interest, encouraging synthesis and application of concepts and encouraging the forming of generalizations (Olmo, 1978).
- ix. It is useful to compare traditional methods of instruction and the inquiry method side-by-side in order to see the major differences:

Neol (1983) investigated the influence of advance organizers in a systematically designed lesson to teach rule-using behavior on transfer of rule learning to problem solving situations. The sample consisted of 72 5th and 6th grade elementary students. The findings show that while students benefit from

systematically designed instructions to teach rules, advance organizers incorporated in that instruction do not necessarily enhance learning transfer.

Dennis (1984) investigated the effectiveness of advance organizers and repetition on achievement in a high school biology class. The sample consisted of four groups of 10th grade students. California Achievement test, a Lindquist type I Research Design and A Multivariate analysis of Variance were utilized. The findings showed that there was no significant interaction between treatments on the two dependant variables. However, there was a significant gain in achievement by students in all groups from pre-test to post-test.

Kranshen (1987) argues that only simple rules can be consciously learned and remembered. According to his hypothesis, comprehensible input and the effective state are the true causes of language acquisition and there is no necessity for previous conscious knowledge of a rule.

Dodey (1988) investigated that a comparison of inductive and deductive material for teaching economic concepts to culturally disadvantaged children. New curricular materials were used to ascertain whether inductive or deductive teaching methods would yield significant differences in learning economic concepts. A total of 484 disadvantaged fourth grade students were assigned on a random stratified basis of classes in which the economics units were taught by one of the two methods. Data were gathered by pretesting and post testing on the economics units and by measures of race, sex, socioeconomic status, intelligence, and ratings of teachers and their competency in the subject. Statistical analysis showed that the inductive method was consistently more effective than the deductive method with all disadvantaged subjects in the study.

The purpose of the study by Winter (1989) was to investigate if a difference exists in high school foreign language students' comprehension of grammatical concepts depending on whether an inductive or a deductive teaching approach was used. It explores the advantages of both approaches for students of all ability levels rather are too difficult for weak ones. High school students were chosen for this study. In order to have large sample size, three different schools took part in the study. In order to control teacher's behavior, it was decided to make the experiment written. The grammatical point being taught in the study then was a new one for students. The inductive presentation comprised of the students reading a sheet containing two columns of about ten carefully organized contrasting examples of a structure. The deductive group was given a paper with the appropriate rule and the same examples as those on the inductive sheet. Both groups were given an exercise sheet to essay their comprehension. Both groups then took the same close test to determine their comprehension. An analysis of variance was used to determine the relative effectiveness of the two presentations, inductive and deductive. The students did as well with the inductive presentation as with the deductive which offers strong evidence against the notion that an inductive approach should not be used for difficult structures. However, the inclination was in favor of an inductive approach for students of all ability for learning grammar commonly considered to be difficult.

Nixt as cited by Khan and Siddique (1991) investigated the relative effects of frequent use of advance organizers and structural reviews in a college mathematics course for students who were not physical science, engineering, or mathematics majors. The sample consisted of students enrolled in a freshman mathematics course. He found that there was no significant difference for treatment effect, recitation effects, or interaction.

Folker as cited by Khan and Siddique (1991) investigated the effects of adjunct post-questions and expository advance organizers on problem-solving from prose text. The sample consisted of 88 introductory psychology students. A post-test only control group was utilized. The findings showed that there were no significant performance differences between having and not having advance organizers, and there were no significant interaction effects.

Noriko Nagata (1995) describes a new parser Japanese tutor, "BANZALI" designed for second language instruction. The paper also presents an empirical study using the BANZALI program. The relative effectiveness of teaching explicit grammatical rules as opposed to providing relevant examples without rule instruction has been a subject of continuing debate in second language acquisition research. This debate raises an important design question for computer feedback. To answer this question, an experiment was performed in which two types of feedback were implemented into the BANZALI program: rule based (deductive) feedback and example based (inductive) feedback. The participants in the study were students taking Japanese at the college level, most of whom were native English speakers. The results of the study indicate that ongoing rule driven deductive feedback is more effective than example driven inductive feedback for learning relatively complex structures whose grammatical rules are not salient in light of examples. (Noriko Nagata, 1995)

Lohman, (1995) investigated the effects of an Inductive versus a deductive training method on the job behaviors of supervisors" (Margaret C. Lohman) discusses a study that showed that although supervisors in a group trained with deductive methods demonstrated a greater ability to apply their learning, supervisors trained inductively perceived that the quality of their training experience was better;

implications of these findings for HRD theory, research, and practice are presented. “Identifying instructional criteria in corporate settings” (Clark J. Hickman) reports on a factor analysis study of a national sample of 372 trainers who reported the criteria they employ when deciding to adopt or reject a proposed new instructional method. “Exploring the use of training games” (James J. Kirk, Hal Shoemaker) explores differences in the use of games by trainers in 82 companies. Trainers who spent a large percentage of their training time on gaming activities used games to generate ideas or solutions, whereas trainers using games less tended to use them to introduce new concepts. “Structured on the job training: Domain and factors” (Jong Cheul Yang) critiques previous definitions of structured on the job training and suggests a model for the process.

Rose and Fong (1997) reports the results of a study on the effects of inductive and deductive approaches to instruction in pragmatics with the target features being compliments and compliments responses. The sample consisting of the two treatments and a control group was first year students in the faculty of the business at the City University of Hong Kong. The instruments were used as three forms of questionnaires. The three classes were randomly assigned to two experimental groups and one control group. The control group of course got no treatment, but completed all three questionnaires during the same time periods as the experimental groups. Each experimental group received instruction in compliments and compliments responses that consisted of six lessons lasting for approximately thirty minutes each. Content was the same for both groups. This study provided some evidence, though tentative, that instruction in pragmatics can make a difference in a foreign language content but deductive instruction may produce better results for both pragmatics and socio-pragmatics.

Fouzia (1999) conducted a study in the “Effectiveness of teaching mathematics through inductive deductive method Vs lecture method at secondary level in Federal Government school for girls, Rawalpindi” at College of Education for Women Chaklala. The purpose of this study was to identify the effectiveness of lecture method and inductive deductive methods of teaching mathematics at secondary level. “Pretest and posttest equivalent group design” was used by the researcher for her study. The researcher concluded that inductive deductive methods of teaching was more effective method as compared to lecture method in the teaching mathematics because it improved students' achievement and was helpful to create interest in students.

Farrell and Hesketh (2000) presented a method to teach heat and mass transfer courses that will appeal to the inductive learner. Studies have shown that induction promotes deeper learning and results in longer retention memorization of the information to students. During his experiment, he found that this inductive to heat and mass transfer has created more opportunity for active learning through laboratory experiment than class discussion. It was concluded that if a limited number of students are available then it should be preferred. Inductive method students felt that mass transfer topic was easiest to understand through inductive approach rather than traditional approach.

Noreen, 2003 investigated the effects of direct instructional model on mathematics achievements among 7th class students. The objectives of the study were to treat the experimental group by direct instruction model of teaching while the control group continued studying through usual method of teaching. The sample of the study consisted of all the 32 female 7th class students of P.A.F. School Chaklala Rawalpindi. A 25 item self-prepared mathematics achievement test was used. The

design of the study was pre test post test equivalent group design. The data was analyzed through t-test. It was concluded that experimental group was found to be superior as compared to the control group.

Hafeez, 2003 investigated the direct instructional model on Urdu grammar achievement of 6th class students. The objective of the study was to teach the experimental through direct instructional model and control group through traditional method. A pre test and post test was used to measure the achievement of the student of both groups. The test was consisted of 50 items. The design of the study was pre test post test control group design. The data was analyzed through mean SD correlation and t-test. It was concluded that the performance of the experimental group was better than the control group.

Riasat (2006) conducted a study to “compare the effectiveness of lecture method and inductive deductive method for teaching mathematics at elementary level in Bright Hall School Rawalpindi” at Bilquis College of Education for Women, Chaklala. The purpose of the study was to identify which method was more suitable for teaching mathematics at elementary level. “Pretest and posttest equivalent design” was used by the researcher for her study. The researcher conducted that inductive deductive method is an appropriate method for teaching mathematics at elementary level.

Basharat (2006) aimed at comparing the effectiveness of inductive method and lecture method of teaching mathematics to 9th class. The study was delimited to Fauji Foundation School Pindi Gheb. The students were divided into two groups experimental group and control group. The same pretest and post test was used for both groups. Both the groups were taught by the same teacher in the similar condition. Treatment duration was four weeks after the treatment the post test was given to both

groups for measuring the achievement of the students. Data was analyzed by applying t-test and the significance of difference between mean was calculated. The group which was taught through inductive method is superior than performance of the control group.

Nina Pajunan (2007) explored to test whether there are any differences between the acquisition of two groups that were taught the singular and plural nouns of English either according to the deductive or the inductive method. The first group had 17 participants and they were taught inductively approach and the second group consisted of 15 participants and they were taught deductively. Each group had a teaching experiment of 45 minutes and the groups were not allowed to communicate between the posts. Several sentences concerning the grammar points of the singular and plural nouns were made up for the inductive group and asked to find out rules from the examples. On the other hand, deductive group received first rules which were followed by various examples of the rule usage and asked to form a few examples themselves. The data was analyzed by applying mean and t-test. The deductive approach showed slightly better results.

The purpose of study by Kariuki and Bush (2008) was to examine the effect of total physical responses by story telling and the conventional teaching method on a foreign language in a selected high school. The sample consisted of 30 students who were randomly selected and randomly assigned to experimental and control group. The experimental group was taught using total physical response by story telling and the control group was taught using the traditional method. Data were collected using teacher made tests. Data were analyzed using independent samples t-test. The results indicated a significant difference between experimental and control group in over all performance. Significant difference was found between experimental and control

group on vocabulary achievement. Total physical response by story telling appeared to be a powerful tool to use in teaching a foreign language.

The aim was to study effects of an extension of physical education and motor training on motor skills, attention and cognition during a period of three years. The study has two intervention groups (n = 152) that have physical activity and motor training one lesson every school day and one control group (n = 99) that has the school's ordinary physical education two lessons per week. The method is hypothetic deductive. The results confirm the hypothesis that children's motor skills improve with extended physical activity and motor training. The hypothesis that children's attention will improve cannot be confirmed. Although pupils in intervention groups have better attention in school year 2 than pupils in the control group, the differences do not remain in school year 3. The third hypothesis concerning academic achievements is confirmed by several results in Swedish and mathematics. The MUGI observation programme was found to be useful both as a screening and as a pedagogic instrument (Ericsson, 2008).

This empirical study presented the description of two teaching methods called "deductive" and "inductive" approaches. The first involved providing a group of participants with rules and then examples directly and separately, but the second approach involves providing another group of participants with examples or content without offering explicit grammar rules, and so the students would induce such rules by themselves. This study investigated the effects of each approach and the interaction between "the type of teaching approach" and "the use of the active and passive voice sentences" in English as a foreign language (EFL). Ninety three freshman and junior university students participated in this study. They were chosen randomly from three classes in two universities in Jordan. The method of the study

included a pretest, two lessons for each group in the three classes and a posttest. The results of the study reveal a significant statistical result at the level of 0.05 between the two approaches for the deductive group. But there is no significant difference between classes for the same type of approach. There is also no significant difference between classes for the same type of approach. There is also no significant effect for the interaction between approach and class (Adel, 2008).

A small sample of previous research reviewed here shows some results are in favour of deductive transmitter of knowledge model and some are support inductive inquiry model. Mostly deductive approach is considered to be a better way of teaching rather than inductive approach because of a possible bias against the inductive model. It is generally considered as no more than habit formation rather than as a cognitive activity.

CHAPTER 3**RESEARCH METHODOLOGY**

This chapter explains method and procedure used to collect and analyze data pertaining to the study problem under the following headings:

3.1 POPULATION

The target population of the study consisted of 2088 students of 10th class studying in Govt. High School for Boys located in Rawalpindi city. The accessible population was composed of 256 students studying in Govt. High School DAV College Road, Rawalpindi. The size of the target population was therefore 2088 and that of accessible population was 256.

3.2 SAMPLE

The study sample consisted of 90 students who were chosen out of the 256 students. The Government High School DAV College Road, Rawalpindi was randomly selected for the study, firstly because the required number of students were available in that school; secondly, it was a model school of the city. Thirdly, the students studying in this school belonged to different socio economic strata. Fourthly, the school principal expressed his willingness to cooperate in the conduct of the experiment.

The study sample consisted of 90 students out of 256 students of 10th class studying in Govt. High School D.A.V. (Deo Anand Vernacular) College Road Rawalpindi who were assigned to two experimental groups and one control group. Each group consisted of thirty subjects equated on the variable of pretest academic achievement through matching. In order to select the sample, pretest was given to all the 256 students of 10th class. The marks obtained by them were arranged in

descending order. The students of equivalent pretest scores were identified. Each of them was assigned to one of the three groups. The same procedure was adopted for each group containing 30 students. These three groups were randomly named as experimental group one, experimental group two and control group.

3.3 RESEARCH INSTRUMENT

In order to measure academic achievement of the sample in the subject of Pakistan Studies before and after the experiment, an achievement test was designed. It contained fifty multiple choice items (Appendix 'A'). The content covered in the test was new subject matter and that was taught during experiment. Hundred percent weightage was assigned to the topics to be learnt. Thus all the 50 items were related to new material. The time duration of the test was fixed as fifty minutes, which was considered to be appropriate for completing the test by all students well in time.

The test was delimited to the four chapters of the Pakistan Studies book prescribed by the Punjab Text Board, Lahore (Pakistan). The test was also delimited to the first three levels of Blooms' taxonomy (cognitive domain), from knowledge to application. Because these three levels are mostly taken into consideration while preparing the achievement test in the Pakistani context such scholars as Gronlund (1990) focus on these three fundamental types of learning. The reliability of the test was found out through Kuder Richardson formula (KR - 21) as follows:

$$r_{\text{total test}} = \frac{(k)(SD^2) - X(K - X)}{(SD^2)(K - 1)}$$

Where

K = the number of items in the test

SD = the standard deviation of the scores

\bar{X} = the mean of the scores

(Gay, 2000. P.149)

For this purpose, the test was conducted in two Govt. High Schools, Namely, Govt. Abbasi High School, Afandi Colony, Rawalpindi, and Govt. High School, Milad Nagar, Dhoke Ratta, Rawalpindi. The reliability of the test was found to be 0.7 which seems to be quite reasonable for achievement tests.

The instrument's content validity was ensured by preparing a table of specifications as shown below:

Table 2: Table of Specifications

First Three levels of Cognitive Domain

Content	Knowledge	Comprehension	Application	Total
Chapter-1 Establishment of Pakistan	5	6	1	12
Chapter-2 Constitution of Islamic Republic of Pakistan	5	5	2	12
Chapter – 3 Pakistan Culture	6	6	1	13
Chapter – 4 Education	5	7	1	13
Total	21	24	5	50

3.4 MATERIAL

The material in this study consisted of lesson plans that were prepared separately on each topic, as per the requirement of each teaching model. The four chapters taught during the experiment were chapter 1: establishment of Pakistan

chapter 2: constitution of Islamic Republic of Pakistan, chapter 3: education, and chapter 4: culture of Pakistan. The researcher ensured the contents to remain the same when she prepared different lesson plans. The lesson plans were developed in the light of the model used in teaching and Hunter's following seven lesson planning steps:

Step One: Anticipatory set is used to increase the students' interest in and motivation to learn the material. It can be started from an orienting question.

Step Two: In objective and purpose step, the teacher moves to tell students what the point of the lesson is and why it is important.

Step Three: The input step is where teacher selects and applies his/her specific teaching strategy. It could be a lecture (Model one), a small group discovery (Model Two).

Step Four: The step of modeling means demonstration, accompanied by verbal description of what teacher wants the students to do.

Step Five: The step of checking for understanding is carried out to know whether students are progressing in learning the new material by means of questions.

Step Six: The step of guided practice means that the students do the activity under teachers' direct supervision which precedes the last step of independent practice.

Step Seven: The step of independent practice is basically a test of the first six steps.

The lesson was taught in the national language because the subject of social studies is taught in national language even in English Medium schools. An English version of a small lesson is given at Appendix "B", "C" and "D".

3.5 EXPERIMENT

The design used to conduct the study was “Pretest Post test control group design which, according to Gay (1996), is a type of true experimental design. Teaching models, namely, transmitter of knowledge model and inductive inquiry model were the independent variable and academic achievement was the dependent variable in this experimental study. This design was used because it controls for maximum number of internal and external sources of experimental validity. Moreover, it can be expanded to include more than two treatment groups. Three groups were randomly formed through matching the subjects in terms of their pretest achievement scores.

The symbolization of the design is described as:-

R	O ₁	T ₁	O ₂	
R	O ₃	T ₂	O ₄	
R	O ₅	—	O ₆	(Gay, 1996)

Where R stands for random assignment

O stands for pretest post test

T stands for treatment

Three comparison groups were formed through random assignment. The subjects, 10th class students, were administered a pretest of the dependent variable. Two experimental groups received the treatment of teaching models whereas the control group was taught as usual through traditional method. All the groups were post tested after the experiment.

3.6 PROCEDURE

The procedure as adopted in the conduction of this experimental study consisted of following sequential steps:

1. In the summer of 2008, the researcher met the Principal of the school in order to get his permission to conduct the study in his school which was allowed by him and he showed his willingness to cooperate in the study by extending all possible help in provision of necessary resources.
2. The principal was requested to provide a list of 10th class students studying the subject of Pak Studies. He was also requested for provision of required classroom facilities.
3. A self developed pretest in the subject of Pak Studies was prepared in consultation with class teachers.
4. The pretest was administered on students of 10th class in order to obtain their pretest scores. The pretest scores (Appendix “D”) were arranged in descending order and three groups were formed through matching them on the basis of their pretest scores.
5. The three groups were randomly assigned to experimental groups and control group. The difference in the mean scores of three groups is shown in table 3. The obtained F ratio (0.035) is less than the critical F ratio of 2.72 at 0.05 level. This implies that the comparison groups were similar in their average performance on the pretest.

Table 3: Significance of difference between mean pretest scores of the comparison groups

Source of Variation	Sum of Squares	df	Mean Squares	F	p
SS _{between}	0.82	2	0.41	0.035	>.05
SS _{within}	1008.97	87	11.60		
SS _{Total}	1009.79	89			

(df = 2, 87)

F_{.05} = 2.72

6. The first experimental group was exposed to transmitter of knowledge model and second experimental group was taught through inductive inquiry model while the control group was taught through conventional teaching.
7. Since the essence of experimentation is group equivalence on all relevant variables except the independent variable, three groups were exposed to all other learning conditions and facilities as similarly as possible.
8. All the groups were taught by the investigator herself in order to equate the teacher qualification, experience and skills, as no volunteer teachers identical on teaching ability and experience could be obtained.
9. Each group was taught daily. Timings were alternated in order to equate the timing factor for the comparison groups.
10. The subjects were taught for the same amount of time each day under almost similar environmental conditions. The teaching content was also the same for all groups.
11. The duration of the experiment was eight weeks.
12. The amount of the time was same for the pretest and the posttest and also testing conditions were kept the same. All the students completed the test in the stipulated time.

3.7 ANALYSIS OF DATA

The following procedure was adopted for analyzing the data obtained through the above procedure.

Six types of statistics were used for data analysis. These were description statistics such as mean, standard deviation and coefficient of variation (V). The inferential statistics used in the study were analysis of variance, Scheffe test and Tukey's w test.

The procedure used in analyzing the obtained information is described in the sequence given below:

1. In the present study, there were three groups, two of them were experimental and one was control group. The mean pretest and post-test scores of three groups were determined separately. The formula for the calculating mean score used in the study was

$$M = \frac{\sum X}{N} \quad (\text{Garrett, 2000, P 27})$$

Where	M	Stands for mean score
	N	Stands for sample size
	X	Stands for raw scores
	\sum	Stands for sum of

The standard deviation scores of the above three comparison groups, both on pretest and posttest, were calculated to complement the mean scores obtained in the step I.

2. Standard deviation scores were computed by using the following formula:

$$SD = \sqrt{\frac{\sum x^2}{N}} \quad (\text{Garrett, 2000, P 50})$$

Where	SD	Stands for the standard deviation of the score
	x	Stands for a deviation of raw score from mean score
	N	Stands for number of measures

3. Coefficient of variation was used to compare the groups on the extent of variability in pretest and posttest scores. The formula used for calculating the coefficient of variation was:

$$V = \frac{100\sigma}{M}$$

(Garrett, 2000, P 57)

Where

V	Stands for coefficient of variance
M	Stands for mean
σ	Stands for standard deviation

4. As the number of groups were more than two, instead of using t-test, ANOVA was used to compare the groups on their pretest as well as posttest performance. The formulae used were:

$$SS_{\text{Total}} = SS_{\text{Between}} + SS_{\text{Within}}$$

Where

SS_{Total}	Stands for total sum of squares
SS_{Between}	Stands for sum of squares between groups
SS_{Within}	Stands for sum of squares within particular group

$$SS_{\text{Between}} = \frac{(\sum x_1)^2}{n_1} + \frac{(\sum x_2)^2}{n_2} + \frac{(\sum x_3)^2}{n_3} - \frac{(\sum x)^2}{N}$$

(Gay, 2000, P 493)

Where

$\sum X$	Stands for the sum of scores of specific group
n	Stands for sample size of particular group
N	Stands for total for all the groups

5. The Scheffe test, as recommended by Gay (2000), was applied to find out which two groups were different in their posttest performance. The formula for calculating F by means of Scheffe test was:

$$F = \frac{\left(\bar{X}_1 - \bar{X}_2\right)^2}{MS_w \left(\frac{1}{n_1} + \frac{1}{n_2}\right) K - 1} \quad \text{with } df = (K - 1), (N - K)$$

(Gay, 2000, P 495)

Where X_1 and X_2 stands for comparison groups

K Stands for number of treatments

N Stands for total sample size

Ms Stands for mean square

$$F = \frac{MS_b}{MS_w}$$

MS_b Stands for mean square between groups

MS_w Stands for mean square within groups

Tukey w test was also applied to verify the results obtained after applying Scheffee test.

$$\text{Tukey's } w = q(t, v, sl) \sqrt{\frac{MS_{error}}{r}}$$

(Faqir, 2000, p.280)

Where w stands for critical difference

q stands for the upper point of the studentized range at the specified level of significance

sl stands for specified level of significance (r)

v stands for degrees of freedom

t stands for number of treatments

$$\sqrt{\frac{MS_{error}}{r}}$$

stands for the standard error of the mean for equal number of replications

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the analysis and interpretation of the data pertaining to the study problem. It contains seven tables.

Table 4: Mean and standard deviation of pretest scores of two experimental groups and the control group

Group	N	Mean	S.D	Coefficient of Variation
Experimental-I	30	22.53	2.99	13.2
Experimental- II	30	22.40	3.13	13.9
Control Group	30	22.30	3.14	14.0

The table 4 indicates that the mean pretest scores of comparison groups were 22.53, 22.40 and 22.30 respectively. Spread of individual scores around their respective means was from 2.9 to 3.1.

When their variability was tested through the coefficient of variation, the control group was found to be a bit more variable than two experimental groups, the variability of the experimental group 1 being the least which means that the experimental groups were more homogenous than the control group. The equality on pretest scores, among comparison groups was also statistically determined through Simple ANOVA as given in the following:

The raw pretest scores of two experimental groups and the control group are given in Appendix “D”.

Table 5: Mean and standard deviation of posttest scores of experimental groups and the control group

Group	N	Mean	S.D	Coefficient of Variation
Experimental – I	30	36.40	3.4	9.34
Experimental – II	30	38.97	3.0	7.71
Control	30	34.13	3.3	9.40

The table 5 above indicates that the mean posttest scores of the experimental group taught through transmitter of knowledge model was 36.40 and experimental group exposed to inductive inquiry model was 38.9 whereas the mean posttest score of the control group was 35.13. The above comparison groups had spread of scores around their mean scores ranging from 3.0 to 3.4. It means that the experimental group taught through inductive inquiry model showed highest average achievement and control group showed the lowest average achievement on the posttest. The coefficient of variation with respect to experimental group taught through inductive inquiry model was the least measuring slightly that there was less variation among the members of this group on academic achievement.

The difference in posttest achievement among the comparison groups was also statistically determined by simple ANOVA, as shown in table 6. The raw posttest scores of the comparison groups are given at Appendix “E”.

Table 6: Significance of difference between mean posttest scores of the comparison groups

Source of Variation	Sum of Squares	df	Mean Squares	F	p
S.S Between	228.87	2	114.435	10.42	<.05
S S within	955.63	87	10.984		
Total SS	1184.5	89			

df = (2, 87)

$F_{.05} = 2.72$

The table 6 shows that the obtained F ratio is 10.42 which is much greater than the critical F ratio of 2.72 at .05 level of significance. The obtained F ratio is therefore, statistically significant. Therefore, the null hypothesis No 1, that there is no significant difference between the mean post-test achievement scores of the experimental groups taught through transmitter of knowledge model and inductive enquiry model and control group taught through the conventional teaching is rejected which implies that there was real difference among the posttest means of comparison groups. In order to find out which two groups differ in their mean posttest scores, Scheffe test was applied as given in the next three tables.

Table 7: Comparison of the experimental group (i) and experimental group (ii) on the mean posttest scores through Scheffe test.

Group	Mean	F	p
Group-I	36.4	4.5	<.05
Group-II	38.9		

df = (1, 58)

$F_{.05} = 4.00$

The table 7 indicates that mean posttest scores of the experimental group I (transmitter of the knowledge model) and the experimental group II (inductive inquiry model) were significantly different at .05 level of significance, group II was superior in posttest performance than group I. Therefore, the null hypothesis No 2 that there is no significant difference between the mean post-test achievement scores of students exposed to the transmitter of knowledge model and inductive enquiry model is rejected.

Table 8: Comparison of the experimental group (i) and experimental group (ii) on the mean posttest scores through Tukey's w test.

Group	Mean	Mean Difference	p
Group – I	36.4	2.57	>.05
Group – II	38.9		

df = (3, 87)

Tukey's w at .05 = 2.05

The table 8 shows that the obtained difference between the mean posttest scores of the experimental group I (Transmitter of knowledge model) and experimental group II (Inductive inquiry model) was significantly higher at .05 level of significance. Thus group II was found higher with equated of mean in posttest performance to group I. Thus, the results obtained through application of Scheffee in table 7 were confirmed through Tukey's w test. Therefore the null hypothesis No. 2, there is no significant difference between the mean posttest achievement scores of students exposed to the transmitter of knowledge model and inductive inquiry model, is rejected.

Table 9: Comparison of the experimental group (i) and the control group on the mean posttest scores through Scheffe test.

Group	Mean	F	p
Group-I	36.4	1.10	>.05
Group-III	35.1		

df = (1, 58)

F_{.05} = 4.00

Entries in table 9 show that mean posttest scores of the experimental group I (Transmitter of knowledge model) and group III (control group) were not significantly different at .05 level of significant. Therefore, both the comparison groups were not found significantly different in their posttest performance. Therefore, the null hypothesis No. 3, there is no significance difference between the mean posttest achievement scores of students exposed to the transmitter of knowledge model and those taught through conventional teaching was retained.

Table 10: Comparison of the experimental group (i) and the control group on the mean posttest scores through Tukey's w test.

Group	Mean	Mean Difference	p
Group-I	36.4	1.27	<.05
Group-III	35.1		

df = (3, 87)

Tukey's w at .05 = 2.05

The above table No. 10 shows that mean difference on the posttest scores of the experimental group I (Transmitter of knowledge model) and group III (Control group) was not significantly different at .05 level of significance. Thus both the comparison groups were not found really different in their posttest performance.

Thus, the results obtained through the application of Scheffe test were confirmed through Tukey's w test. Therefore, the null hypothesis No. 3 that there is no significant difference between the mean posttest achievement scores of students exposed to the transmitter of knowledge model and those taught conventional teaching, was retained.

Table 11: Comparison of the experimental group (II) and the control group on the mean posttest scores through Scheffe test.

Group	Mean	F	p
Group-II	38.97	10.07	<.05
Group-III	35.13		

df = (1, 58) F_{.05} = 4.00

Table No. 11 shows that the mean posttest scores of the experimental group II (inductive inquiry model) and the group III (control group) were significantly different at .05 level of confidence. It means that both the comparison groups were much different in posttest performance. Therefore, null hypothesis No. 4, there is no significant difference between the mean posttest achievement scores of students exposed to the inductive inquiry model and those taught through conventional teaching was rejected.

Table 12: Comparison of the Experimental Group (II) and the Control Group on the mean posttest scores through Tukey's w test.

Group	Mean	Mean Difference	P
Group-II	38.9	3.84	>.05
Group-III	35.1		

df = (3, 87) Tukey's w at .05 = 2.05

Table No. 12 shows that the obtained difference between the mean posttest scores of the experimental group II (Inductive inquiry model) and the group III (Control group) were significantly different at .05 level of confidence. Thus group II was found to be superior in posttest performance to the group III. Thus, the results obtained through application of Scheffe test were confirmed through Tukey's w test. Therefore, null hypothesis No. 4, there is no significant difference between the mean posttest achievement scores of students exposed to the inductive inquiry model and those taught through conventional teaching, was rejected.

DISCUSSION

The present study was conducted to find out the comparative effectiveness of the transmitter of knowledge model and inductive inquiry model on students academic achievement at secondary level in a public sector school of Rawalpindi City. There were two experimental groups and one control group. During the experiment, one experimental group was taught through transmitter of knowledge model and the other experimental group was taught through inductive inquiry model and the control group was taught through conventional teaching.

In this study, Inductive inquiry model was found to be more effective than the transmitter of knowledge model and conventional teaching. The secondary students taught through the discovery model showed superior achievement in the subject of Pak Studies. The results of the present study match particularly with those of Shaffer's (1989), Farrell and Hesketh's (2000), and Prince and Felder (2006). Shaffer (1989) compared inductive and deductive approaches to teaching foreign languages. Though the scholars have long maintained that inductive approach should not be used for difficult concepts, Shaffer found it other way round because inductive approach appeared to be more useful in learning the foreign language. This point of view is also supported by Kranshan (1987) who argues that only simple rules can be consciously learned and remembered. To him, comprehensible input and the affective state are the true causes of language acquisition and there is no necessity for previous conscious knowledge of a rule. Farrell and Hesketh (2000) investigated an inductive approach to teaching the topic of Heat and Mass transfer to the engineering students at college level. The results of this study indicate that inductive approach was better than traditional approach. The results of present study match with this research, though the subject and class level were different.

Prince and Felder (2006) provide a broader analysis of inductive method in different forms. They cite studies reporting a robust positive effect of learning through problem solving on development of a variety of problem solving skills, conceptual understanding, ability to apply meta cognitive and reasoning strategies and team work skills, which ultimately influence learning achievement of the students.

Present study results did not, however, support Nagata (1995), Rose and Fong (1997), Kalia (2005) and Nina Pargunen (2007) as detailed below:

Nagata (1995) investigated the relative effectiveness of teaching explicit grammatical rules as opposed to providing relevant examples without rule instruction that has been a subject of continuing debate in second language acquisition research. The findings of the study indicate that ongoing rule driven deductive feedback is more effective than example driven inductive feedback for learning relatively complex structures. Nagata conducted the study at college level and in the subject of language.

Rose and Fong (1997) investigated the effects of inductive and deductive approaches to instruction in pragmatics with the target features being compliments and compliment responses. The study consisted of three groups at university level and the instruments used were three forms of questionnaire. The findings of this study showed that deductive approach was better than inductive approach in foreign language teaching for both pragma linguistics and socio pragmatics.

Kalia (2005) investigated the effectiveness of mastery learning strategy and inquiry training model on the achievement of students from a school at Rohatak. This showed that inquiry training model of teaching did not have as much significant impact on science achievement as did mastery learning model.

Pajunan (2007) investigated the differences between the acquisition of two groups that were taught the singular and plural nouns of English either according to the deductive or the inductive method. The deductive approach showed slightly better results.

As no experimental study in social and behavioral sciences can be perfect and flawless, this study, when looked into critically, contained possible flaws. While designing the present study, in order to control the extraneous teacher variable, it was thought convenient to provide treatment to the experimental groups and control group by the researcher herself. This step might have influenced the results of the study due to the unconscious bias of the researcher (John Henry's effect) against the transmitter of knowledge model and more so against traditional method as both are more similar to each other. Had the treatment groups been taught by two separate teachers who were equally experts to apply the discovery model and the transmitter of knowledge model, the results of the study would have perhaps been more accurate and reliable. But to find such teachers who were equally competent in teaching the subject of social studies through these methods was very difficult, if not impossible. Moreover, training of the two traditional teachers in the use of two new models was also not feasible. Even if such teachers could be obtained for experimentation, another possible factor influencing the study results could not have been ruled out i.e. the element of novelty and newness. As we know, whenever a new method or technique is adopted, it influences the students positively leading to better achievement. The inductive inquiry model and the transmitter of knowledge model both were new for the students. Therefore, improved performance was visible among the students of experimental groups as compared to the students of the control group. Newness of

method of instruction and newness of teacher might have positively influenced the results.

In Pakistani classrooms, questioning and answering technique is not very common and main teaching focus is upon telling the new information to the students. It was a different experience for groups of students taught through an approach which was new for them. The novelty and variety in the use of methods made students more attentive. Therefore, when the inquiry model was used, punctuated frequently by a series of questions, the relevant group of students paid more attention, were allowed more wait time for thinking after the questions. Their level of understanding might have been much superior to other comparison groups.

During the instruction of inductive inquiry model, the researcher used different types of material like videos, models, pictures, charts and also the text book. The students performed different activities during the experiment, especially when they were taught through inductive inquiry model. This might have influenced their understanding due to learning by doing, thus improving their academic achievement.

The subject of Pak Studies is considered a less structured subject which is generally taught through dictation of notes, text book reading and straight lecturing. This traditional approach is highly objectionable for teaching an important subject like social studies in order to prepare productive and motivated citizenry. Keeping in view its importance, it is necessary to teach the subject with greater zeal and devotion by using modern models of teaching like inductive inquiry model.

In the present study, though inductive inquiry model was found superior to transmitter of knowledge model as well as conventional teaching, however, transmitter of knowledge model improved students performance as well as conventional teaching. Both transmitter of knowledge model and conventional

teaching appeared to show improvement in their performance of the students but slightly less than inductive inquiry model. In fact, transmitter of knowledge model and conventional teaching are very similar to each other except that the former is more systematic and logical in its approach than conventional teaching.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary, findings, conclusions and recommendations:

5.1 SUMMARY

The purpose of the study was to explore and compare the effectiveness of use of transmitter of knowledge and inductive inquiry models on students academic achievement. The main objective of the study was, therefore, to compare the effect of transmitter of knowledge model and inductive inquiry model on students academic achievement. It was hypothesized that the students taught through transmitter of knowledge model and the students exposed to inductive inquiry model will show the better performance than the control group taught through conventional teaching. It was also hypothesized that inductive inquiry model will indicate superior students performance than the performance of students taught through transmitter of knowledge model. The sample of the study consisted of 90 students of 10th class studying in Govt High School DAV College Road, Rawalpindi. The sample was selected on the basis of their pretest scores through matching and the groups were randomly assigned for the treatment. The experimental groups were taught through teaching models while the control group was taught through conventional teaching, as usual, method. The self developed achievement test consisting of 50 multiple, choice items was used for the purpose of pretest and posttest. The material used for teaching the experimental groups and control group consisted of lesson plans, textbook, charts,

pictures, models and video films. Each of them was prepared in the light of each teaching models. The data were summarized and analyzed by using such statistical techniques as mean, standard deviation, coefficient of variation, analysis of variance and Scheffe test. The level of significance used in study was .05 level.

5.2 FINDINGS

The main findings of the study were:

1. The mean posttest scores of the comparison groups were 36.40, 38.97 and 35.13 respectively. Spread of individual scores around their respective means ranged from 3.0 to 3.4. The coefficient of variation of the experimental group ($V=9.34$), taught through transmitter of knowledge model and the control group ($v = 9.40$) taught through traditional method were higher than the coefficient of variation of experimental group ($v = 7.71$) exposed to inductive inquiry model (table 5).
2. There was significant statistical difference among the mean posttest scores of the experimental groups and the control group ($F = 10.42$) at .05 level of confidence. Therefore, null hypothesis No. 1 was rejected. (table 6)
3. There was significant statistical difference between the mean posttest scores of the experimental group I taught through transmitter of knowledge model and experimental group II exposed to inductive inquiry model as tested through Scheffe test. Therefore, the null hypothesis No. 2 was rejected (table 7).
4. There was significant statistical difference between the mean posttest scores of the experimental group I taught through transmitter of knowledge model and experimental group II exposed to inductive inquiry model as tested through Tukey's w test. Therefore the null hypothesis No. 2 was rejected (table 8).
5. There was no significant statistical difference between the mean posttest scores of the experimental group I (taught through Transmitter of knowledge model) and a

control group (taught through conventional teaching) as tested through Scheffe test. Therefore, the null hypothesis No. 3 was retained (table 9).

6. There was no significant statistical difference between the mean posttest scores of the experimental group I (taught through Transmitter of knowledge model) and a control group (taught through conventional teaching) as tested through Tukey's w test Therefore the null hypothesis No. 3 was retained (table 10).
7. There was significant statistical difference between the posttest scores of the experimental group II (taught through inductive inquiry model) and the control group taught through conventional teaching as tested through Scheffe test. Therefore, the null hypothesis No. 4 was rejected. (table 11).
8. There was significant statistical difference between the posttest scores of the experimental group two (taught through inductive inquiry model and the control group taught through conventional teaching as tested through Tukey's w test. Therefore, the null hypothesis No. 4 was rejected. (table 12).

5.3 CONCLUSIONS

Based upon above findings, following conclusions were drawn:

1. The alternative hypothesis No. 1 was supported. It was concluded that the students taught through transmitter of knowledge model and inductive inquiry model did better than the students of control group taught through conventional teaching.
2. The alternative hypothesis No. 2 was supported. Therefore, it was concluded that the students taught through inductive inquiry model did better than the students taught though transmitter of knowledge model.

3. The alternative hypothesis No. 3 was not supported. Therefore, it was concluded that the students exposed to transmitter of knowledge model and those taught through conventional teaching did not differ in their achievement scores on the posttest.

5. The alternative hypothesis No. 4 was supported. It was therefore concluded that the students taught through inductive inquiry model showed better performance than those students taught through conventional teaching on their mean post-test scores.

Thus the inductive inquiry model was found superior to the transmitter of knowledge model, which was not found to be superior than conventional teaching.

The overall conclusion derived from the study findings was that inductive inquiry model was found to be more effective for teaching of Pakistan Studies to 10th class students than transmitter of knowledge model and conventional teaching.

5.4 LIMITATIONS OF THE STUDY

Some limitations of this study should be taken into account before generalizing the results of the study. Firstly, the study was conducted in urban settings, therefore, the generalization of the results on rural settings may be limited.

Secondly, the Pakistan Studies achievement test used in the present study for pre-testing and post-testing was the same. The use of parallel test might have given better results.

5.5 RECOMMENDATIONS

On the basis of findings, conclusions and the discussion, the following recommendations are made for action and further research:

1. Since the inductive inquiry model was found to be superior to transmitter of knowledge model, the teachers of Pakistan Studies be trained to use inductive inquiry model in particular and transmitter of knowledge also because the latter was found to be more effective than conventional teaching in this study. Student curiosity be stimulated and interest through stimulating questions be fostered to promote deep thinking. The modes of inductive and deductive teaching may also be emphasized during teaching practice in teacher training programmes in Pakistan.
2. For the subject of social studies, most of the time, lecture method is used. It is recommended especially at primary level that activity based teaching be adopted as it will help the learners to understand knowledge rather than just memorizing facts and concepts.
3. Transmitter of knowledge model and inductive inquiry model are new models of effective teaching that require thorough understanding and sufficient practice before using them during instruction. In future studies sufficient rigorous training in these models be provided to the teachers of the experimental group before conduction of the experiment.
4. The experimental groups in the present study were taught by the researcher herself that might have confounded the study results. In order to avoid experimental bias, it is more desirable if regular teachers of the same institution are selected to provide the treatment to the experimental groups after ensuring adequate training and practice in the new methodology. This

step may control the critical teacher variable polluting the effect of the independent variable.

6. The present study was carried out on male urban students in an Urban English medium school located in big city of Pakistan. Similar studies be also replicated on male rural, female rural and female urban students both at secondary as well as elementary levels for teaching social studies and the school subjects other than Pak Studies. In order to confirm and generalized the present results of the study.
7. The subject of Pakistan Studies is considered to be a less structured subject which is generally taught through dictation of notes, textbook reading and straight lecturing. This traditional approach is highly objectionable for teaching an important subject like social studies in order to prepare productive and motivated citizenry. Keeping in view its importance, it is necessary to teach the subject with greater zeal and devotion by using modern models and method of teaching like inductive inquiry model.
8. Since inductive inquiry model was found to be the most effective model of teaching social studies, the social studies teachers be provided intensive training in the use of inductive inquiry model, and in the development of instructional material to be employed while using the inductive inquiry model.
9. As the present study compared transmitter of knowledge model and inductive inquiry model, experimental studies may also be conducted for the evaluation of the effectiveness of other teaching models like cooperative learning, direct instruction, indirect instruction and concept attainment models of teaching etc.
10. Transmitter of knowledge model is more appropriate for teaching facts and inductive inquiry model is more appropriate for teaching concepts. The

curriculum of social / Pak studies, like other school subjects, mostly consist of facts and concepts, therefore, a blend of these two models might be more suitable for simultaneous teaching of facts and concepts than the isolated use of these models. Therefore, the combined use of these models might lead to superior learning on the part of students. Further research in this direction might serve as useful breakthrough in teaching Social / Pak Studies at school level.

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APPENDIX 'A'**PRETEST / POSTTEST****PAKISTAN STUDIES (10th CLASS)**

Name:

Group:

Roll No:

Time: 50 Minutes

Date:

Total Marks: 50

Test:

Obtained Marks:

General Instructions:

1. Attempt all questions.
 2. Please read the questions carefully before answering.
 3. Write your Name, Roll No. and group / class.
 4. This test comprises 50 questions. Every question carries one mark each.
 5. Cutting and more than one answer for each question carries no marks.
-

1. What is Two Nation Theory?
 - a. That Hindus and Muslims are two separate nations
 - b. That Hindus and Muslims are not two separate nations
 - c. Being citizens of one country they are a nation
2. When did the Two Nation Theory originated?
 - a. When Muhammad Bin entered came to Hindustan.
 - b. When the first Muslim came to Hindustan.
 - c. When the first Hindu converted to Islam.

3. Which movement aimed at motivating and advising Muslims to fulfill their obligations?
 - a. Faraizi Movement
 - b. Mujahideen Movement
 - c. Khilafat Movement
4. Who took up the responsibility of the reformation of the nation in the Aligarh Movement?
 - a. Haji Shariat Ullah
 - b. Haji Muhammad Hassan
 - c. Sir Syed Ahmed Khan
5. Which movement aimed at security of the Holy cities of Islam and protection of Islamic Caliphhood?
 - a. Non-cooperation movement
 - b. Habshah Movement
 - b. Khilafat movement
6. Nawab Siraj Ud Dolah after being defeated in teh battle of Palasi due to treachery of his own people.
 - a. disappeared
 - b. Escaped
 - c. was martyred
7. What response did Muslims get in Shimla delegation from the Viceroy.
 - a. Positive response
 - b. Negative response
 - c. No response
8. In which pact did Hindus accept the separate identity of the Muslims.
 - a. Jamhoriat pact
 - b. Lucknow pact
 - c. Hindustan pact
9. Whose fourteen points in Pakistan movement are popular?
 - a. Allama Iqbal's
 - b. Ch. Rehmat Ali's
 - c. Quaid-e-Azam
10. According to the Two Nation Theory, what kind of a state should Pakistan be today?
 - a. Secular
 - b. Islamic Republic
 - c. Islamic Socialist

11. Which Award deprived Pakistan of the waters of Sutlaj, Ravi and Bias.
 - a. Kashmir Cliff Award
 - b. Redcliff Award
 - c. Lord Curzen Award
12. Which of the following is required to run a state.
 - a. administration
 - b. Law
 - c. Political insight
13. How many years did Ayub Khan rule Pakistan.
 - a. 3 years
 - b. 10 years
 - c. 15 years
14. Absence of constitution can cause in a state.
 - a. chaos
 - b. Defeat
 - c. Weakening
15. A document of fundamental principles for administering a state is called
 - a. constitution
 - b. Legislation
 - c. Executive
16. Which is the most powerful intuition of the state according to 1973 constitution of Pakistan.
 - a. Presidency
 - b. Prime Minister
 - c. Parliament
17. According to 1973 constitution, how can the Chief Justice and other judges of the Supreme Court be restored.
 - a. With the executive order from the President
 - b. through Parliament
 - c. Through Chief of the Army Staff
18. When was the country named Bangladesh founded?
 - a. in 1970
 - b. In 1971
 - c. In 1972
19. In the election of 1970 which political party got majority.
 - a. Muslim League
 - b. People's Party
 - c. Awami League
20. Which system of Government was established in Pakistan according to 1962 constitution?
 - a. President
 - b. Parliamentary
 - c. Secular

21. When did Gen. Pervaiz Musharaf dismiss Nawaz Sharif Government and came into power?
- a. 1998 b. 1999 c. 2000
22. Who was elected as Prime Minister in 1998.
- a. Nawaz Sharif b. Benazir Bhutto c. M. Khan Junejo
23. Which was the first issue that around after Pakistan came into being?
- a. Building b. Water c. Constitution
24. Which of the following handicrafts belongs to Sindh?
- a. Ajrak b. Utricles made from Clay
- c. Mirror and embroidery work.
25. Who was the famous poet of Punjabi?
- a. Amir Karor b. Sachal Sirmast c. Khawaja Ghulam Farid
26. Which is most important factor of culture?
- a. language b. Politics c. Civilization
27. Which province of Pakistan is famous for finest mirror work on dresses?
- a. Punjab b. Sindh c. Balochistan
28. Which of the following is a degree in law?
- a. M. Com b. L.L.B c. Textile
29. The collective behaviour of a society is called
- a. Politics b. Civilization c. Culture
30. According to whom is culture a acquired habit and as a result of it an impact is created which is ever changing.
- a. Goate b. Johen Wiliam c. John F.
31. Drawing, Caligraphy, Architecture and Music are included in
- a. Painting b. Fine Arts c. Language & literature

32. Which language is known as a symbol of unity of a nation?
- a. Regional language b. National language
- c. International language
33. Which city of Pakistan is famous for carrying on wood furniture?
- a. Chiniot b. Muzararabad c. Faisalabad
34. Which cities are famous for utinicils with Mosaic?
- a. Lahore and Kasoor b. Gujrat and Wazirabad
- c. Bahawalpur and Multan
35. is the language of the Baloch Tribes of Balochistan?
- a. Saraiki b. Pashto c. Balochi
36. Which city of Pakistan is known for production of sports goods.
- a. Gujranwala b. Faisalabad c. Sialkot\
37. The education received by attending some institution regularly is known as education.
- a. Technical b. Formal c. Informal
38. is the first school of a child.
- a. Mosque b. Mother c. Primary school
39. Which university has been established as a result of integrating all colleges and institutions concerned with Teacher Education in Pakistan.
- a. Engineering University b. Agricultural University
- c. University of Education
40. What do we call the education acquired through correspondence.
- a. Formal Education b. General Education
- c. Distant Education

41. From which class level to which class, education in Pakistan is considered Primary Education.
- a. First to Third b. First to Fifth c. First to Sixth
42. Where is Allama Iqbal Open University situated?
- a. in Lahore b. In Karachi c. In Islamabad
43. When was Aligarh Muslim University founded?
- a. 1910 b. 1915 c. 1920
44. Which university will be useful for the education in Information technology through distant education program.
45. Education of 11th and 12th standards is included in level of education.
- a. Secondary b. Higher Secondary c. Higher Education
46. A program which develops literacy in adults is called
- a. Compulsory education b. Free education
- c. Adult education
47. How can we improve the standard of education in Pakistan?
- a. By appointing teachers on political grounds.
- b. By appointing teachers on merit
- c. By increasing the rate of literacy.
48. How can we improve performance of students in examination?
- a. through cheating and copying b. Through memorization
- c. Through developing comprehension
49. Why is national language called a source of unity and integration.
- a. It brings people of different nationalities
- b. It brings people belonging to different regions closer.
- c. It creates in environment of conflict among people belonging to different areas.
50. On which profession economy of Pakistan depends.
- a. Agriculture b. Trade c. Government Job

APPENDIX “B”**LESSON PLAN****MODEL NO. 1**Class: 10th

Subject: Pak Studies

Period: 1st

Time Duration: 35 minutes

Topic: Constitution of Islamic Republic of Pakistan Teacher: Miss Qaisara

Step One	<p>This unit deals with the history of constitutional development in Pakistan. A number of constitutions have been developed in Pakistan. In this lesson, you will be made aware of the meaning of constitution, the main points of objectives resolution and salient features of the 1956 constitution that was formulated in the light of objectives resolution. Later lessons on the topic will deal with the political circumstances and events that led to development of constitutions of 1962 and 1973.</p> <p>Every country needs laws to regulate its affairs. Achievement of national objectives is only possible by the enforcement of good laws. Laws provide basis for smooth running of the administration of a state. Management of the country needs a constitution. The constitution is a collection of fundamental rules and regulations for smooth running of the administration of a state. The constitution is the supreme law of a state. It is difficult to conceive a state without it. As the conditions, needs and demands of each state are different, so the constitutions of various states are also different.</p> <p>The constitution can be written or an unwritten one.</p>
Anticipatory set	

<p>Step Two</p> <p>Objectives and Purpose</p>	<p>The instructional objectives of the lesson are:</p> <ol style="list-style-type: none"> 1. To give the students the meaning of the term constitution. 2. To provide them information about the “Objectives Resolution”. 3. To provide information to the students about constitution of 1956.
<p>Step Three</p> <p>Input</p>	<p>Transmission of knowledge model will be used for teaching.</p>
<p>Step Four</p> <p>Modeling</p>	<p>What is meant by constitution?</p> <p>Constitution is the supreme law of a state. The importance of constitution can be stated as: constitution is the essential and supreme law of state. Constitution is a collection of laws and traditions. Violation of constitution is a serious crime. Every government performs its duties and functions within constitutional limits. Constitution defines the basic objectives and priorities of the government policies and laws of the state are made in the light of the constitution. Constitution protects the rights of the people.</p> <p>(The information given below shall be transmitted in an expository way to the students by the use of lecture and supported by the use of charts, pictures, flash cards and writing board to illustrate and describe the following points).</p> <p>Objectives Resolution</p> <p>The Prime Minister of Pakistan, Liaquat Ali Khan, presented a historic resolution on 12th March 1949 in the National Assembly.</p>

The resolution laid down the basic principles for making of the future constitution of Pakistan. Federal legislature approved it. It is generally called objectives resolution. It defined the objectives which could be helpful in clarifying the format of the future constitution.

The main points of the objectives resolution were as under:

1. Sovereignty of Allah: Objectives Resolution categorically states that sovereignty all over the universe belongs to Allah. Power is a trust with the people and it is to be exercised within the prescribed limits by the elected representatives of the people.

2. Observance of Islamic Values: it laid down that in Pakistan, Islamic values like democracy, equality, fraternity, freedom of expression, tolerance and social justice would be exercised.

3. Islamic Way of Life: It was affirmed that an adequate environment would be provided to enable the Muslims to lead their individual and collective lives accordingly to the basic principles of Islam.

4. Security of Minorities: All the minorities living in Pakistan shall be fully free to lead their lives accordingly to the basic principles of their religious and beliefs.

5. Protection of Fundamental Rights: It is affirmed that all the citizens of Pakistan shall be guaranteed fundamental rights without making any discrimination on any basis.

6. Federal form of Government: It was specifically mentioned that Pakistan shall have a federal form of government and its system shall be administered through the elected representatives of the people.

7. Development of Backward Areas: It was stressed that maximum efforts shall be made for the development of backward and remote areas to bring them at par with developed areas.

8. Independence of Judiciary: It was affirmed that judiciary shall be free from all the pressures and would work independently.

9. The National Language: It was made clear that Urdu shall be national language of Pakistan.

After the approval of objectives resolution, the process of the formation of constitution started. Objectives Resolution was incorporated in all the constitutions made in Pakistan as a preamble. It was made a part of the constitution of 1973 by making an amendment in 1985.

Process of constitution making in Pakistan

After the approval of objectives resolution, it became certain that on which lines the constitution would be made. For this purpose, a committee comprising the members of federal legislature was constituted, but unfortunately Pakistan was engulfed by various huge problems and no attention could be paid to the constitution.

Due to lack of political stability that continued changing rapidly, the work could not be accomplished early. In such states of affairs, Governor General, Ghulam Muhammad, dissolved the Federal Assembly on 24th October, 1954 and announced the formation of new constitution assembly. Another important hurdle in the way of making the constitution was the west wing of Pakistan that consisted of four provinces and east wing of one province but having majority in population. In order to overcome this hurdle, all the four provinces of west wing were merged into one unit named West Pakistan. After the formation of one unit and elections of new Federal Assembly, the process of constitution making became easier. New Prime Minister, Ch. Muhammad Ali, paid full attention to the making of new constitution and got it approved from federal assembly.

Salient Features of Constitution of 1956

The first constitution of Pakistan was enforced on 23rd March, 1956. Salient features of this constitution were:

1. Pakistan was declared an Islamic Republic.
2. Federal Parliamentary system was introduced in the country.
3. It was affirmed that sovereignty belongs to Allah, and exercise of power through the elected representatives of people, a necessary environment to enable the people to lend their lives according to the basic principles of Islam, and full religious freedom to minorities were guaranteed.

4. Citizens were given full civic rights to lead a prosperous life and utilize their faculties.
5. It was guaranteed for the judiciary to work independently, and security of service to judges was ensured.
6. Under the constitution of 1956, Urdu and Bengali were declared as the national languages.
7. Constitution of 1956 was in written form.

Step Five

Checking of understanding

1. What is Constitution?
2. Who presented a historic resolution on 12th March, 1949 in the assembly?

Step Six

Guided Practice

The following exercise will be given to the students for guided practice.

1. Violation of constitution is a serious
2. is bound to remain loyal to the constitution.
3. presented a historic resolution on 12th March, 1949, in the assembly.
4. Objective resolution was made a part of the constitution of
5. All the four provinces of west Pakistan merged into
6. The first constitution of Pakistan was the constitution.
7. Full attention was paid to the development of first constitution by the Governor General
8. The first constitution declared the name of the country as

Step Seven		The students will be provided independent practice through the
Independent		following homework assignment.
Practice		Define constitution, describe main points of objectives resolution and the salient features of 1956 constitution.

APPENDIX “C”**LESSON PLAN****MODEL NO. 2**Class: 10th

Subject: Pak Studies

Period: 2nd

Time Duration: 35 minutes

Topic: Constitution of Islamic Republic of Pakistan Teacher: Miss Qaisara

Step One	This unit deals with the history of constitutional development in
Anticipatory set	<p>Pakistan. A number of constitution have been developed in Pakistan. In this lesson, you will be made aware of the meaning of constitution, the main points of objectives resolution and salient features of the 1956 constitution that was formulated in the light of objectives resolution. Later lessons on the topic will deal with the political circumstances and events that led to development of constitution of 1962 and 1973.</p> <p>Every country needs laws to regulate its affairs. Achievement of objectives is only possible by the enforcement of good laws. Laws provide basis for smooth running of the administration of a state. Management of the country needs a constitution.</p> <p>Q: What is meant by constitution?</p> <p>Q: Which is the supreme law of a state?</p> <p>Q: Does every state have the same constitution?</p>
Step Two	The instructional objectives of the lesson are:
Objectives and	To help the student
Purpose	1. To help the student attain the concept of constitution.

	<p>2. To help them discover the main points of the “Objectives Resolution”.</p> <p>3. To assist them arrive at salient features constitution of 1956.</p>
Step Three	Inductive inquiry model will be used for teaching.
Input	
Step Four	Q: What is meant by Constitution?
Modeling	(The students will be asked the following questions to help them arrive at the concept of constitution though guided discovery)
	Q: What does a Constitution describe?
	Q: How does the constitution differ from law?
	Q: Is a constitution collection of law?
	Q: Do traditional also form part of the constitution?
	Q: How does the government perform its duties and functions?
	Q: In which document the duties and functions of the government given?
	Q: Is violation of constitution also a crime like violation of law?
	Q: In which light, all the policies and laws of the state are made?
	Q: What document protects the rights of people?
	Objectives Resolution
	Who was the first Prime Minister of Pakistan?
	The Prime Minister of Pakistan, Liaquat Ali Khan, presented a historic resolution on 12 th March 1949 in the National Assembly. The resolution laid down the basic principles for making of the future constitution of Pakistan. Federal legislature approved it. It

is generally called objectives resolution. It defined the objectives, which could be helpful in clarifying the format of the future constitution.

(After giving the above information interpersonal with discovery questions, the students then will be asked to read the textbook page about the objectives resolution where they will be encouraged to think and discover the answers to the following questions).

Q: What is meant by sovereignty of Allah?

Q: What does observance of Islamic values mean?

Q: What is concept of Islamic way of life?

Q: In objectives resolution, what is said about the minorities in Pakistan?

Q: What in your opinion, does the objectives resolution say about the protection of fundamental rights of people?

Q: Which form of government was decided in the objectives resolution?

Q: What was said in the objectives resolution about the development of backward areas?

Q: How was the judiciary system to be formed?

Q: Which will be national languages of the country?

After the approval of objectives resolution, the process of the formation of constitution started. The resolution was incorporated in all the constitutions made in Pakistan as a preamble.

How can you explain the process of constitution making in Pakistan

After the approval of objectives resolution, it became certain on which lines the constitution would be made. For this purpose, a committee comprising the members of federal legislature was constituted, but unfortunately Pakistan was engulfed by various huge problems and no attention could be paid to the constitution. Due to lack of political stability that continued changing rapidly, the work could not be accomplished early. In such states of affairs, Governor General, Ghulam Muhammad, dissolved the Federal Assembly on 24th October, 1954 and announced the formation of new constitution assembly.

The students will be asked to think about the following questions:

Q: What was important hurdle in the way of making the constitution regarding the West Pakistan?

(They will be guided to arrive at the following answer to the above question).

(Then the students will be asked :)

When did the process of constitution making become easier:

After the formation of one unit and elections of new Federal Assembly, the process of constitution making became easier. New Prime Minister Chaudhry Muhammad Ali, paid full attention to the making of new constitution and got it approved from Federal Assembly.

(The following questions will be asked from students to help them arrive at the salient features of the constitution of 1956?)

Q: What name was declared for Pakistan?

Q: What sort of system was introduced in the country?

Q: To whom belongs the sovereignty?

Q: What does the concept of sovereignty mean to you?

Q: Through whom shall this power exercise in the country?

Q: What type of life the people shall be facilitated to lead?

Q: Will the minorities be given religious freedom?

Q: Will the citizens be given full civil rights?

Q: Will the judiciary be free?

Q: What two languages will be national languages of Pakistan?

Q: Was the constitution 1956 in written or non-written form?

Step Five

Checking of
understanding

1. When was Pakistan declared Islamic Republic?
2. Which languages were declared as national languages in the constitution of 1956?

Step Six

Guided Practice

The following exercise will be given to the students for guided practice.

1. Violation of constitution is a serious
2. in bound to remain loyal to the constitution.
3. presented a historic resolution on 12th March, 1949, in the assembly.
4. Objective resolution was made a part of the constitution of
5. All the four provinces of West Pakistan merged into

6. The first constitution of Pakistan was the.....constitution.
7. Full attention was paid to the development of first constitution by the then Governor General
8. The first constitution declared the name of the country as

Step Seven

Independent

Practice

The students will be provided independent practice through the following homework assignment.

Define constitution, describe main points of objectives resolution and the salient features of 1956 constitution.

APPENDIX “D”**LESSON PLAN****MODEL NO. 3**

Class: 10 th	Subject: Pak Studies
Period: 3 rd	Time Duration: 35 minutes
Topic: Constitution of Islamic Republic of Pakistan	Teacher: Miss Qaisara
Teaching Material	Black board, chalk, duster and textbook.
Objectives	<p>i. To aware them about the developmental procedure of the constitution.</p> <p>ii. To provide them information about the importance of constitution.</p>
Audio Visual Aids	Black board will be used.
Teaching method	Conventional method will be used.
Prior knowledge	<p>What do you know about the constitution of Pakistan?</p> <p>Which is the first constitution of Pakistan?</p>
Announcement of the Topic	We will discuss today “constitution of Islamic republic of Pakistan”
Reading by the Student	<p>Objectives Resolution</p> <p>The Prime Minister of Pakistan, Liaquat Ali Khan, presented a historic resolution on 12th March 1949 in the National Assembly.</p> <p>The resolution laid down the basic principles for making of the future constitution of Pakistan. Federal legislature approved it. It</p>

is generally called objectives resolution. It defined the objectives which could be helpful in clarifying the format of the future constitution.

The main points of the objectives resolution were as under:

1. Sovereignty of Allah: Objectives Resolution categorically states that sovereignty all over the universe belongs to Allah. Power is a trust with the people and it is to be exercised within the prescribed limits by the elected representatives of the people.

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6. Federal form of Government: It was specifically mentioned

that Pakistan shall have a federal form of government and its system shall be administered through the elected representatives of the people.

7. Development of Backward Areas: It was stressed that maximum efforts shall be made for the development of backward and remote areas to bring them at par with developed areas.

8. Independence of Judiciary: It was affirmed that judiciary shall be free from all the pressures and would work independently.

9. The National Language: It was made clear that Urdu shall be national language of Pakistan.

After the approval of objectives resolution, the process of the formation of constitution started. Objectives Resolution was incorporated in all the constitutions made in Pakistan as a preamble. It was make a part of the constitution of 1973 by making an amendment in 1985.

Presentation

Partial
Recapitulation

- i. What is objective Resolution?
- ii. When objectives Resolution passed by legislative assembly?

Second Step

Process of constitution making in Pakistan

Reading by the
student

After the approval of objectives resolution, it became certain that

on which lines the constitution would be made. For this purpose, a committee comprising the members of federal legislature was constituted, but unfortunately Pakistan was engulfed by various huge problems and no attention could be paid to the constitution. Due to lack of political stability that continued changing rapidly, the work could not be accomplished early. In such states of affairs, Governor General, Ghulam Muhammad, dissolved the Federal Assembly on 24th October, 1954 and announced the formation of new constitution assembly. Another important hurdle in the way of making the constitution was the west wing of Pakistan that consisted of four provinces and east wing of one province but having majority in population. In order to overcome this hurdle, all the four provinces of west wing were merged into one unit named West Pakistan. After the formation of one unit and elections of new Federal Assembly, the process of constitution making became easier. New Prime Minister, Ch. Muhammad Ali, paid full attention to the making of new constitution and got it approved from federal assembly.

Salient Features of Constitution of 1956

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3. It was affirmed that sovereignty belongs to Allah, and

exercise of power through the elected representatives of people, a necessary environment to enable the people to lead their lives according to the basic principles of Islam, and full religious freedom to minorities were guaranteed.

4. Citizens were given full civic rights to lead a prosperous life and utilize their faculties.
5. It was guaranteed for the judiciary to work independently, and security of service to judges was ensured.
6. Under the constitution of 1956, Urdu and Bengali were declared as the national languages.
7. Constitution of 1956 was in written form.

Presentation

.....

Final
Recapitulation

- i. When assembly passed first constitution?
- ii. What do you know about the process of constitution making in Pakistan?

Home Assignment

Write a detail note on first constitution of Pakistan.

APPENDIX "E"

PRETEST ACHIEVEMENT SCORES OF 10TH CLASS

Experimental Group I		Experimental Group II		Control Group III	
M. Ali Raza	28	M. Umar	28	Sher Niaz	28
S. Abdul Mateen	27	Mohsin Ali	28	Badr Jamil	28
Zain Ali	27	Tahir Islam Raja	27	S. Faizan Hassan	27
Arham Hassan	27	M. Sheraz	27	Akmal Saeed	26
Aqib Shakir	26	Syed Farhad Ali	26	Wajid Ali	26
Najam Ul Hassan	26	Zeeshan Ahmed	26	M. Umair Shehbaz	26
M. Idrees Bashir	25	Sheroze Iqbal	25	Hassan Ali	25
Rehan Suleman	25	Asif Hussain	25	Muqadam Hussain	25
Muhammad Danish	25	Ali Nawaz	25	M. Ali Nawab	25
A. Rehman Danish	25	Haris Tanveer	24	Aazim Hassan	24
Faizan Ul Islam	24	M. Bilal	24	Nadeem Mushtaq	24
Shah Hussain	24	Hassan Jamil	24	Zain Ul Aabdeen	24
Khawaja Mubeen	24	M. Osama	24	Bilal Javed	24
Hashim Rehman	23	Aftab Shoukat	23	Khuram Irshad	23
Muhammad Saeed	23	S. Zeeshan Ali	23	Asad Mehmood	23
Zohaib Arshad	23	Attiq Mehmood	23	Rizwan Ikhlaq	23
Bilal Hussain	23	S. Jaffar Ali	22	M. Usman	22
Fahad Ahmed	22	Umair Afzal	22	Sheikh M. Idrees	22
Muhammad Arshad	22	Nasir Qadeer	22	Aatif Ali	21
Syed Sajid Ali Shah	21	Raja Faisal	21	Shahid Khan	21
Owais Nasim	21	Atta Ur Rehman	21	M. Umar	21
Hafiz M. Idrees	21	Arslan Haider	20	M. Faisal Musthaq	20
Hafiz M. Saghir	20	Ayaz Khan	20	Hafiz M. Saeed	20
Mirza Yasin	20	Waqar Farooq	20	Rana Sultan	19
Ali Saleem	19	Saqib Ali	19	M. Saleem	19
Zeeshan Rashid	19	M. Adil	19	Rafaqat Hussain	19
Muhammad Israr	18	Rehbar Gulistan	19	Saddam Hussain	19
Fahad Adeel	18	Ali Nawaz	18	M. Shohaib	18
Yasir Jameel	18	Hafiz M Suleman	17	M. Junaid	17
Ali Alyas	17	M. Danial	16	Taimor Ahmed	16

APPENDIX “F”

POSTTEST ACHIEVEMENT SCORES OF 10th CLASS

Experimental Group I		Experimental Group II		Experimental Group III	
M. Ali Raza	34	M. Umar	33	Sher Niaz	33
S. Abdul Mateen	31	Mohsin Ali	40	Badr Jamil	30
Zain Ali	37	Tahir Islam Raja	37	S. Faizan Hassan	36
Arham Hassan	39	M. Sheraz	35	Akmal Saeed	38
Aqib Shakir	40	Syed Farhad Ali	40	Wajid Ali	38
Najam Ul Hassan	36	Zeeshan Ahmed	39	M. Umair Shehbaz	37
M. Idrees Bashir	39	Sheroze Iqbal	40	Hassan Ali	38
Rehan Suleman	37	Asif Hussain	42	Muqadam Hussain	36
Muhammad Danish	31	Ali Nawaz	38	M. Ali Nawab	29
A. Rehman Danish	28	Haris Tanveer	39	Aazim Hassan	27
Faizan Ul Islam	35	M. Bilal	38	Nadeem Mushtaq	34
Shah Hussain	37	Hassan Jamil	40	Zain Ul Aabdeen	36
Khawaja Mubeen	40	M. Osama	39	Bilal Javed	38
Hashim Rehman	36	Aftab Shoukat	41	Khuram Irshad	35
Muhammad Saeed	34	S. Zeeshan Ali	38	Asad Mehmood	33
Zohaib Arshad	41	Attiq Mehmood	36	Rizwan Ikhlaq	40
Bilal Hussain	30	S. Jaffar Ali	34	M. Usman	29
Fahad Ahmed	36	Umair Afzal	33	Sheikh M. Idrees	35
Muhammad Arshad	33	Nasir Qadeer	35	Aatif Ali	32
Syed Sajid Ali Shah	35	Raja Faisal	41	Shahid Khan	34
Owais Nasim	433	Atta Ur Rehman	40	M. Umar	41
Hafiz M. Idrees	37	Arslan Haider	39	M. Faisal Musthaq	36
Hafiz M. Saghir	34	Ayaz Khan	40	Hafiz M. Saeed	32
Mirza Yasin	38	Waqar Farooq	42	Rana Sultan	36
Ali Saleem	37	Saqib Ali	45	M. Saleem	35
Zeeshan Rashid	40	M. Adil	42	Rafaqat Hussain	38
Muhammad Israr	41	Rehbar Gulistan	40	Saddam Hussain	39
Fahad Adeel	39	Ali Nawaz	44	M. Shohaib	37
Yasir Jameel	36	Hafiz M Suleman	36	M. Junaid	35
Ali Alyas	38	M. Danial	43	Taimor Ahmed	37