CHAPTER 1

INTRODUCTION

Let’s consider the scenario of secondary schools where the teachers are applying the numerous models of teaching to accomplish a variety of course goals and assisting the students for raising their interest as learners. The teachers use various teaching models for learning material. They acquire how to accomplish the concepts and how to formulate them. They help the students in distinguishing how to perform in the academics and co-curricular activities like arts, sciences, sports and social skills. They recognize their cognitive, emotional and physical development. In such situation the inquiry-based teaching model can be more influential and efficient to teach the students.

1.1 MODELS OF TEACHING

The models of teaching are the basis of the learning process. The major impact of the teaching is being measured on the basis of abilities to instruct the students. The role of the efficient teachers includes both abilities of captivating and significant anchor. Moderately, the teachers engage their students in healthy perceptive and clarify different terms or concepts during their teaching.

The educationalists Bruce Joyce and Marsha Weil defined the model of teaching in a fastidious approach. They illustrated the models of teaching as a preparation or prototype that can be used to outline curriculum, to devise instructional materials and to conduct instruction in the classroom. These models are actually a replica of learning. As the teachers facilitate students in attaining the information, ideas, skills, values, traditions, thoughts, and resources of communicating themselves, the teachers are also training them how to become skilled. In reality, the majority important long-term conclusion of tutoring may be the students' increased capabilities to discover supplementary fluency and effectiveness in the expectations, both because of the
Knowledge and skill they have obtained and because they have mastered in the learning process.

The major aim of this process is to motivate the students to think about their subjects and topics. Thus, a major role in teaching is to generate authoritative learners. This factor makes the best environment of the learning the new teaching subjects. Thus, along with the passing of the time, the teaching becomes supplementary operative as the students’ evolution through those models. Hence teaching models provide the way to generate the best environment for students’ learning. The teachers get success in fulfilling their achievements and objectives. The teaching process contains multiple phases starting with pre-preparations by students and ending with final test and result analysis [71].

1.2 TEACHING METHOD

The word 'method' defines the 'mode' or 'way' to accomplish the task or given aims. In the case of teaching, the teaching methods explain the means through which the study material is transferred from the teacher to the student. In another way, the method of teaching may be defined as the way or manner by which the teacher conveys knowledge and skills during the teaching process and the students understand knowledge and accomplish the skills in the process of learning. This definition clarifies that method comprises both teaching (teacher’ activity) and learning (learner’ activity).

Rage et al. (1979) defined teaching methods as “Teaching methods are patterns of the teacher behaviors that are recurrent, applicable to various subject matters, characteristic of more than one teacher, and relevant to learning”. It means, methods are a fragment of the comportment of teacher which he/she uses as an approach or campaigns of teaching. The method is also related to content and is helpful in engendering learning.

1.2.1 History

The cautious study of history of teaching methods has shown that method of teaching has been observed as an evolutionary process. Most of the noteworthy variation in teaching methods has regularly been linked with broader society and educational changes. As per Historical aspects, J.A. Comenius was the person who laid importance on teaching methods. Comenius laid stress on the significance of intelligence, experience and also
suggested that environment, it could provide such familiarities. Comenius, in Jean Piaget's view, "may undoubtedly be considered as one of the precursory of the genetic idea in developmental psychology". He has further promoted that thinking was associated with action as the sense imprint, and out of the interrelationship of the three came to learn. Action should come preceding to skill and training theory [65].

Pestalozzi laid stress on "psychologizing education" with following points as given below:

1. To grow methods in line with the progressive pattern of students' growth, and
2. To make the development of awareness as the fundamental element in his teaching method.

Froebel methods laid accent on the reading of students taking account of emotion as well as knowledgeable development. Herbert invented a series of instructional steps which is known as Herbertian Teaching Method. The most popular form of 5 steps is as follows:

1. Preparation
2. Presentation
3. Association
4. Assimilation
5. Application

Likewise the followers of Broad-minded Education and John Dewey have observed that the indispensable element in all methods is activity. It will be pertinent to say that teaching methods have been prejudiced over the years, by many factors, Such as:

1. Educational objectives
2. Cultural and political influences
3. Study of learner's intellectual development
4. Educational sensibility
5. Investigation of learning and teaching
6. Technology

1.2.2 Classification of Teaching Methods

There are several methods of teaching having mutual features. These mutual characteristics are associated with classroom dealings and also designate the conduct of the teacher. These are also linked to dissimilar modes of learning.
LD. Zerve and N. Vaidya tried to assemble different methods into different groups as given below [2]:

I. **Oral Method:** It consists of the following methods as given below:
   a. Narration
   b. Recitation
   c. Lecture
   d. Discussion

   ![Teaching method](image)

   **Figure 1.1 Teaching method**

   These methods have the following common characteristics as given below:
   a. Teacher-centered routine
   b. The teacher interconnects information or gives knowledge through spoken means.
   c. The learner is an inactive listener

II. **Activity Method:** It consists following methods as given below:
   a. Demonstration
   b. Activity
   c. Project
   d. Laboratory
   e. Heuristic
   f. Discovery learning inquiry approval
   g. Problem-solving
   h. Supervised method

   These methods have the following common characteristics as given below:
a. Learner-centered
b. Learning takes place due to the active involvement of learners
c. The teacher functions as a facilitator of learning or as a stage setter for learning.

III. **Special Method:** It consists following methods as given below:

a. Programmed learning
b. Team teaching
c. Computer assisted learning
d. Personalized system of instruction

These methods fulfill a precise prerequisite which is based on emotional theories or technological facilities. These methods seek contribution of a beginner.

Assortment of the appropriate teaching method is founded on the objectives of the lesson, the requirements of the beginner and the nature of the content. Several of the commonly used teaching methods are:

1) Lecture Method
2) Discussion Method
3) Demonstration Method
4) Project Method
5) Inquiry-based Method

### 1.3 TRADITIONAL TEACHING

The old-fashioned teaching process is focused on the teacher acted as the controller of the learning atmosphere. The authority and accountability are detained by the teacher. The teachers work as the mentor and decision maker in terms of the curriculum contents and precise consequences. The teachers respect students as partaking 'knowledge holes' that necessity to be filled with information. The old-fashioned teacher assessments that it is the teacher that grounds learning to occur.

Learning is chiefly allied within the schoolroom and is often modest. The lesson's content and conveyance are considered to be further most significant and students mastering knowledge through drill and practice. The subject content prerequisite is not learnt in circumstance. The greatest collective seating arrangement used by the traditionalists is rows.
The rows are the emblematic setting for a teacher-centered classroom and individual learning. The teachers align the students in such a way as they all look at 'front' of the class. The teacher conducts the teaching from this 'front' place. This type of physical setup can be an effective method of behavior administration [85].

Figure 1.2 Students sitting in the rows

In broad-spectrum sense, the traditional teaching model is concerted on mastery of content with less prominence on the extension of skills and the enlargement of inquiring thoughts. The existing teaching methods are teacher centered, with the teacher pressurized on giving out information about "what is known." The students are treated as the beneficiary of the knowledge, and the teacher is the distributor. Much of the assessment of the learner is fixated on the prominence of "one right answer." The conventional education is ancillary worried with grounding for the subsequent grade altitude and in-school accomplishment than with helping a learner cram to learn during whole life.

Traditional classrooms incline to be closed systems where evidence is filtered through layers to students. In general, the practice of resources is restricted to what is accessible in the classroom or indoors the school. The employment of proficiency is paying attention on learning about the expertise rather than its appliance to superior learning.
Lesson plans are used to consolidate the different steps in the learning progression for the whole-class manner. On the right track questions that would predispose to root unconventionalities from the plan are met with, "We will get to that later." It has subsequent reimbursements as given below:

- These models enlarge the teacher for illuminating the hidden knowledge of the concerned topic during teaching.
- These models facilitate the teachers to standardize final goals, course content organization, rapidity and track of a demonstration. In distinction, more student-centered methods are dealing with astonishing student ideas, questions and comments.
- These models motivate the students to give additional awareness in a subject.
- These models can supplement and explicate text material to the students during the teaching process.
- These models complement certain discrete learning partialities. Some students depend upon the organization endowed with by extremely teacher-centered means.
- These models facilitate large-class communication during the classroom.

1.4 LIMITATIONS OF TRADITIONAL TEACHING MODEL

Although this method has above mentioned advantages but it has following disadvantages as given below:

- These models place students in a defensive more willingly than an energetic role, which hinders learning.
- These models encourage one directional communication between them; therefore, the lecturer must mark an attentive effort to expand conscious of student problems and students are more concerned of content without oral feedback.
- These models impose a significant extent of untraced student time slight of the schoolroom to permit sympathetic and long-term preservation of content. In distinction, cooperating methods permit the teacher to achieve students when they are vigorously working with the objects.
• This teaching method necessitates the teacher to discover operative inscription and dialogue skills [54].

1.5 OVERVIEW OF VARIOUS TEACHING MODEL

The core of the teaching process is the preparation of atmospheres within which the students can interrelate. A model of teaching is a plan or configuration that the teachers can use to design face to face teaching in the classroom. Each model guides us as the teachers plan tutoring to help students for accomplishing numerous objectives. Israel Shaffer has told three philosophical models:

• Impression Model
• Insight Model
• Rule Model

Another impact was of John P-Pecesces, who gave the following classification as given below:

• Basic Teaching Model
• Computer Based Teaching Model
• Teaching Model for School Learning
• Interaction Model of Teaching.

B.R. Joyce had divided all the learning models in these groups:

• Social Interaction Model
• Personal Source and
• Behaviors Modification Source [66]

Let's study these models one by one.

1.5.1 Advanced Organizer Model (Ausubel's Model)

Ausubel's principal anxiety is to assist the teachers in organizing and conveying huge amounts of information as implicitly and competently as possible. This model is designed to toughen student's intellectual structures, a term Ausubel uses for a person's knowledge of a precise subject substance at any given time and how well organized, vibrant and stable it is. This model is taken from verbal learning principle, in which the core aim is to stretch the furthermore mind's eye to the students.
According to Ausubel, any subject is a series of concepts and in our mind also, when the teachers admit these facts that is also established as a chain in our mind, if new concept is offered as related with the old one.

In this model, teacher first recalls the previous knowledge, and then gives the new knowledge on the basis of previous one. It systematizes the subject in an order, and presents the topic in such a way that the student will grasp it easily. It is also called as expository model. Here teacher disclosures the entire concepts among students. Teacher gives spoken teaching and students hold it as an entire and a sequence is completed in student's mind.

It is based on the following principles:

1. **Principle of Progressive Differentiation:** In it, the most broadminded idea about the subject is accessible first, then is increasingly distinguished in terms of detail and specific.

2. **Principle of Integrated Reconciliation:** It simply means how the ideas should be consciously reconciled and integrated, with the previous knowledge. Thus, the model is called Advance Organizer Model.

Aims of Ausubel’s Model are being described as given below:

- To give the knowledge of concept and evidence of subject.
- To cultivate the intellectual structure.
- To qualify the students to organize the knowledge in a communal order.
- To extant the pre-knowledge, elucidate facts and then contemporary new knowledge so that the new concepts are correlated to pre-knowledge [23].

### 1.5.2 Inquiry Training Model (Suchman's Model)

It was developed by Richard Suchman to teach students a practice for investigating and explaining infrequent phenomenon. His method takes the students through miniature versions of different dealings that scholars use to associate knowledge and produce principles. On the basis of the instigation of methodical method, it endeavors to communicate students’ specific abilities and philological of academic inquiry.

Inquiry training model has initiated with the certainty in the expansion of self-governing learners. This model’s method necessitates robust involvement in the methodical inquiry.
The youngsters are inquisitive & enthusiastic by the nurture. The inquiry training capitalizes on their usual spirited investigations with the help of precise guidelines so that they discover new-fangled areas supplementary compellingly.

The wide-ranging goal of inquiry training is concentrated in aiding students to improve the intelligent chastisement and skills indispensable to progress questions and pursuit out answers curtailing from the curiosity. Hence this model is being engrossed in assisting students’ question independently in a self-controlled manner. This model motivates the students to ask the questions about the occurrence of the event and interpret data logically. The teacher wants students to cultivate wide-ranging intellectual approaches so that the students can investigate the reasons of the incidences.

These teaching models initiate with the puzzling event among students. Suchman believes that regarding the particular situations, the individuals are logically interested to crack the puzzle. This model has been empathized that it is significant to express students about the attitude that all knowledge is tentative. The students should be motivated to identify and remain contented with the uncertainty. The growth in the knowledge is expedited by the assistance and thoughts from colleagues if the students can learn to endure substitute points of the problem view. Thus, Suchman's theory can be described with the help of following facts as given below:

- The students are being motivated to query logically.
- The students are being motivated to become conscious to analyze their thinking strategies.
- The students are being motivated to learn new strategies directly and add the students into existing frame of references.
- The students are being motivated to learn about the hesitant, embryonic nature of knowledge & appreciate alternative explanations with the help of the cooperative inquiry [36].

These points define the characteristics of Suchmann model observed during the classes.

1.6 WHY INQUIRY-BASED TEACHING?

Richard Suchman had introduced the Inquiry model which is oriented on the coherent strategies used by scientists to resolve the students’ problems and query into the
clandestine which can be educated to students. With the help of these enquiries of the students, the students are being motivated to generate the queries regarding the events. This model operates on the basis of the scientific inquiry. The training process which is done with the help of inquiry is called as the inquiry training.

The inquiry model helps the students to mature the capability to intellect the significance of scientific queries into forms with which they know about occurrence of the evidence that are taught at the time. It makes the material more readily retrievable. The wide-ranging objectives of inquiry teaching model are described as given below:

1. It is dedicated to grow the knowledgeable branch and assistances essential to raise questions and examine answers inhibiting from their natural interest.
2. It helps the students to acquire and process data logically.
3. It encourages intelligent policies which can be practiced to discover out why things are occurring.

![Figure 1.3 Inquiry stages](image)

The inquiries help the teacher and students to resolve their doubts regarding current theme. To efficient utilization of the inquiry there are following steps as given below:
First of all, the teacher and students must take the responsibilities of the learning. The active roles of both teacher and students are mandatory.

The teacher engages a topic and develops basic knowledge about the concerned topic during the class.

To judge the pre-knowledge of the students, the teacher develops the questions.

With the help of the questions, it finds the area where more concentration is being required.

After knowing it, the teacher identifies the resources and gathers the data.

Then such data have been accessed to judge the actual status of pre-knowledge of the students.

The teacher synthesizes the current results found during the data assessment.

The teacher communicates new understanding based on the observation.

Then he/she evaluates the success during delivering the lectures to the students.

In this model, the responsibilities of the teachers are initiated with paradigm of the problem situation, judging the inquiry events and replying to students’ inquiry probes with the essential information. It supports students in establishing an emphasis in their inquiry and simplifying the conversation of the problem situation among the students.

Let’s define the term inquiry before studying the phases of the inquiry-based teaching model [47].

1.7 DEFINATION OF INQUIRY

The Inquiry suggests participation that hints to sympathetic. The term inquiry makes the great impact on the learning process outputs. Before proceeding to next section, the definition of the inquiry must be explained properly.

1.7.1 Definition

The term inquiry may be defined in the multiple ways. In most common manner, the Inquiry term is defined as the process of finding hidden fact, information, or knowledge. In other words, it may be defined as the process of seeking information with the help of asking the questions. The inquiry process runs in every instance of the human life. With start of the life, new born baby observe new event occurrences, it recognizes the objects, it places things in its mouth and then goes toward voices.
The inquiry cannot be generated in the random manner. There are following factors which help the teacher and students to generate the accurate and efficient queries as given below:

- Type and sort of knowledge that should be generated.
- Pre-knowledge about the topic.
- Way of discovering the hidden information
- Requirement of discovering the knowledge
- For the teacher, the factors that should be covered.

These factors define the certain rules for creating or generating the inquiry during the classroom. The factors must be followed to create the healthy inquiry-based teaching environment.
1.7.2 Classification of inquiry

The inquiry has different aspects and the structure used in the teaching and other process. The inquiry plays very different kind of the roles and responsibilities with their implications. Hence the inquiry can be classified in following categories as given below:

- **Structured inquiry**
  Such type of the inquiry has predefined structure and well-defined outputs. The resources for finding the hidden resources are available to the students. The teacher defines the problem in the precise manner and motivates the students to discover the knowledge without alerting about predictable outcomes. Such type of the inquiry has organized nature along with predictable outputs.

- **Guided inquiry**
  In this type of the inquiry, only the resources are provided to the students and self evaluation of the problem is required. The students make their planning and do practice to solve the problem. Such type of the inquiry has predefined layout of finding hidden knowledge with the help of the inquiry.

- **Open inquiry**
  The nature of this inquiry is mostly similar to the guided inquiry. It supports the feature with the addition to the guided inquiry that students also articulate their personal predicament to explore. Open inquiry, in many ways, is analogous to doing science. The Science fair activities are often examples of the open inquiry. It motivates the students to involve more in this process [11].

1.7.3 Significance of Inquiry

Remembering realities and statistics is not the life-threatening convincing proficiency in today's world. The suggestions change, and material is unreservedly available data. The educators must appreciate that the schools prerequisite to initiative outside data and information buildup and transfer toward the troop of valuable and appropriate knowledge. Through the process of inquiry, individuals build greatly of their understanding of the customary and human-designed worlds. Inquiry suggests an "essential or famine to know" attitude. Inquiry is not so plentiful observing for the accurate answer because often there is none but somewhat looking for appropriate fortitudes to questions and issues. For educators, inquiry suggests prominence on the expansion of investigation
skills and the fostering of inquiring insolences or behaviors of mind that will succeed individuals to tolerate the expedition for knowledge during life.

The content of chastisements is exact imposing. The knowledge base for punishments is continuously increasing and changing. For contemporary education, the skills and the capability to endure learning should be the further most significant outcomes.

1.8 INQUIRY-BASED TEACHING MODEL

In this model, the students are being engaged in questioning techniques and share ideas involved in dialogues. The roles of the teacher during the process turn as a conductor who challenges the students to contemplate outside their prevailing procedures with enquiring different questions. The model appeals on research into enquiry-based culture which shows that frequently students experience difficulties in expressing suitable questions which focuses on the envisioned contents. In this context the teacher require to assist them by sketching their consideration to the investigational data and facts relevant to their enquiry and simplifying the discussion normally.

One of the significant concern allied with the practice of the enquiry methods in the schoolroom in the time. Furthermost enquiry workouts extent numerous class sessions and can remain for weeks, which become problematic for a teacher to use it. This prompted the researchers to try small-scale enquiry events in teaching.

Notwithstanding presence of minor in scale, the school room activities in this model involved all the fore most features of enquiry as given below:

- Evolving and scheduling the investigations
- Assembling and inferring data
- Functioning jointly towards a common goal and
- Sharing discrete findings etc.

1.8.1 Advantages of Inquiry-based Teaching model

This section aims to examine, outline and discuss the pros and cons of the use of each method in isolation and also the possible benefits which can be derived from social science curriculum formulated to instruct students through a combination of both the inquiry and traditional teaching. Several researchers realize the reimbursement by means of inquiry-based method of teaching. The teachers should have earliest scheme at the
organization of the classroom and mark definite that the seating agreement is going to comfort students conversion effortlessly from one movement to the other. Moreover, the curriculum and instructions should be altered to encompass supplementary hands-on accomplishments to endorse inquiry-based teaching. There are following advantages of the inquiry-based teaching model as given below:

- With the help of the inquiry, the students gain best knowledge of concerned topic due to their energetic role.
- They are motivated to exercise the topics which have been learned in the classroom.
- It’s extremely imperative in order to make straightforward inquiry-based schooling, the teacher produces self-effacing changes and launches the classroom in a manner so that the teacher could supervise conversion and gain consideration as the students use hands-on analytical activities along with the usage of social science journals and group-based activities and guides the students in the direction of efficient learning process.
- Teachers also take advantage of better association of the classroom. It is also tremendously essential that teachers have the knowledge of engendering and supporting the enquiry-based learning atmosphere. It is important that the teachers get prerequisite from school supervision in turning out the learning environment appropriate for inquiry-based teaching. Some researchers also recommend that at the forefront of teaching, the pre-service teachers should be uncovered to inquiry-based routine at college stage. It is recommended that the pre-service teachers who are educated through inquiry-based method are supplementary potential to promote hands-on activities for their classroom. Teachers who are evident to inquiry-based education are expected to promise science experiments to commonplace life.
- The inquiry-based scientific strategy helps the teachers to advance the education standards. Teachers should always agree with the students to bring out their natural movement and questioning when learning about an innovative conception. The students should be given a prospect where they can pathway their
inquisitiveness. Some researchers judge that science should be introduced to students as an indispensable part of life and not an inaccessible problem.

- This approach requires taking into deliberation the mental needs of the students rather than familiarizing social science as a reasonable & understandable subject. This model helps the teacher to create the learning environment to inspire the students.
- The teacher can convey the authentic life acquaintance to the class which can provide a elegant learning mood. Students also get complementary complex in higher order thinking when they become conscious learners.

With passing of the time brain experiences intelligent growth has been observed and they start to assumpt psychological structures through their association with the impression which would evaluate heavily the technique of finding new facts. It is a learning cycle which helps the students to move from one stage to the next as they attain progressive structures through their communication with environment [84].

1.8.2 Disadvantages of Inquiry-based Teaching model

There are scrupulous drawbacks allied with the usage of the inquiry-based teaching process in the classroom. This method has some limitations also, mention of which are as follows:

- It is not possible to use this method under the structured school curriculum as it is slow in nature and requires a lot of time.
- This method can only be used properly if the teacher who is making use of it is creative. Not only this, if the teacher does not know how to arrange practical experiments work, then also he cannot make use of this method properly.
- As students of different mental capabilities attend the same class in the school, thus it is not possible for all of them to learn various information's through this method effectively.
- If all the students do not take participate in question asking function, then the class room will become dominated by few students, as a result of which other less able students will feel a sense of neglect.
Many elementary school teachers carry the inquiry based learning. However many who are taught using the direct teaching method have a tendency to use this method because they do not feel self-possessed using the inquiry based teaching approach. Most teachers predispose to teach how they are taught.

1.9 TEACHER’S ROLE

In this model, the teacher’s key functions have a major role in the inquiry-based educational environment. A teacher may exercise various roles which are provisional on degree of experience with Inquiry. For paradigm, many teachers already afford opportunities for students to convey what they know in numerous ways, but may not have familiarity documenting and shimmering on student questions as a way of alerting subsequent planning. As the teachers become complementary comfortable moving from teacher-directed to student-centered teaching scheme, they gradually construct these roles into their instructional collection. In complementary old-fashioned classrooms, the teacher is the competent and representative of knowledge which interrelate substance to students through an official, but efficient series of lessons that wrap each catalogue’s possibility. While the attractiveness of teacher as facilitator is categorically an indispensable constituent of inquiry-based teaching, it is also momentous for teachers not to appreciate Inquiry as an approach that proscribe all structure of teacher-directed instruction.

This conservative, “all or nothing” deportment would likely discourage overflowing teachers from realizing this preposterous and delightful method of teaching and learning. Depending on the topic, learner, or question, convinced conditions may call for supplementary teacher-direction than others. For paradigm, the teacher responsibility refers to learning conditions that may require some outline of teacher-direction as given below:

- It forms Inquiry-based thinking procedures for the students.
- It provides the circumstances for students to prompt what they know in various ways.
- It guides students to a variety of dissimilar resources and experience that will support them in the exploration of their questions.
● It documents and replicates on students’ questions and ideas.
● It assists persistent Knowledge Building Discourse.
● It initiates a culture of psychological safety.
● It knows and focuses on broad key concepts rather than Specific Expectations.
● It prompts the students into “Design Mode”:
● It encourages them to submit how to scrutinize their ideas.
● It plans in bendable and reactive techniques.

Figure 1.5 Inquiry cycle

In the figure 1.5, the inquiry cycle has been shown clearly. The teacher’s role is being classified as following manners as given below:

● The questions are being prepared before starting the classes.
● The teacher prepares the plans for generating the inquiry-based teaching environment.
● The teacher shares and communicates the views about the results.
● The teacher collects the information and conclusions through the inquiries.
• Based on the conclusions, the teacher tests the statement and plan.
• The teacher brainstorms the possible solutions.

The teacher-directed directives ensue in self-control for the rationale of reasonably scaffolding students in the direction of their erudition goals, and in turn, to support the students to feel successful as learners. The scrupulous conclusions are being used to determine when it is relevant to distribute supplementary or fewer teacher-directions which is ingredient of the process [76]. All these roles and responsibilities are being displayed in the figure 1.5.

1.10 PHASES OF INQUIRY-BASED TEACHING MODEL

In this model, the teaching process is being divided into various stages as given below:

**Preparation for the Inquiry**

This stage consists of the preparation of the inquiry regarding the topic in the classroom. First it classifies a problem necessitating a description. In selection of the problem or event, these standards need to be considered:

i. The event must pose a problem which requires a discoverable enlightenment for teaching an incident, perception or generalization. The problem must be legitimately interesting and stimulating to the learner.

ii. The level of the problem must be practically coordinated with the level of the learner.

iii. The curiosity and encouragement of the student are improved if the problem is prearranged in discrepant way.

iv. The event emphasizes the student on a specific problem moderately instead of collection of problems.

After reviewing the problem, next phase involves about pronouncement of deciding on the standard for presenting the problem which will convey students to get in touch within problem-evoking circumstances. The intermediate may be discrepant events, manifestation, films, audio tapes, graphs, tables and case studies for starting the inquiry process. It must be perplexing circumstances to the students and variance with the idea of reality.
Reflecting on the Process

This stage is indispensable to every period in the Inquiry-based teaching model. It consists of the following phases as given below:

- Planning phase
- Retrieving phase
- Processing phase
- Creating phase
- Sharing phase
- Evaluating phase

It includes both heartwarming and cerebral domains accompanying with met cognition [64].
1.11 PROBLEM STATEMENT

The statement of problem is given as below “Comparative study of Impact of Inquiry-based Teaching Model on Students’ Academic Achievements in Social Science at Secondary Schools of Rural & Urban area”. The definition of the terms used in the above statement is given below:

- **Inquiry-based Teaching Model** is being concerned with the "Inquiry" concept which includes the process of looking for the truth or knowledge in search of information through questioning.

- **Academic achievement** is being observed as the magnitude of education. This parameter helps the teachers, the parents and the educational institutes to track their educational goals during the particular academic session. It helps the teachers to track the students’ performance during particular academic session in the classrooms.

- **Secondary schools** may be defined as the schools which run the class of the students during their secondary education. The age group of the students is between 12 & 16 years. After completion of the primary school, the students are being permitted to attend the secondary school to complete their higher education.

- **Social science** may be defined as the academic stream or branch which is directly associated with culture and relationships found among the human beings in the society. These human beings habitually trust principally on pragmatic approaches. This subject consists of multiple areas such as anthropology, economics, political science, psychology and sociology. In a widespread sense, it may often comprise specific turfs in the mortalities such as archaeology, history, law, and linguistics.

### Variables

The variable may be defined as a quantifiable characteristic that varies during the research process. These variables may be altered with the respect of the time and location. The statement of the problem consists of the following type of the variables as given below:

- **Dependent Variable**: This type of variables demonstrates the consequence of deploying or familiarizing the independent variables. Their deviation depends on
the variant in the independent variable. In given research statement, there are following dependent variable as given below:

- Academic Achievements.

**Independent Variable:** The independent variables may be defined as variable on which that the researcher should be controlled over. The control means that they may involve influencing accessible variables or initiating innovative variables in the research phases. It may be recommended that the independent variables should make the impact on the dependent variables. In given research statement, there are following independent variables as given below:

- Inquiry-based teaching model
- Traditional teaching model
- Students of Social Science subject
- Students of secondary schools

These variables play very important role in defining the work plan of the research work.

### 1.12 RESEARCH AIMS AND OBJECTIVES

It discusses about comparison between Inquiry-based teaching and traditional teaching system in secondary schools. It has following objectives as given below:

1. To delimit the limitations of traditional teaching system using Inquiry-based teaching model.
2. To enhance the academic achievements of 9th class students in Social Science subject using Inquiry-based teaching model.
3. To enhance the creativity of 9th class students using Inquiry-based teaching model
4. Comparison of Inquiry-based teaching model with traditional teaching model.

### 1.13 FORMULATION OF RESEARCH HYPOTHESES

The research hypothesis may be defined as the statement which defines the probability or expectation of the research work. These predications must be verified during the research work. To study hypothesis, the researcher is predicting the relationship between variables. Through the research work, the researcher proves her hypotheses. This is a practice of sighting to cause superior considerations or assumptions. It is not a strict proof as in logic or mathematics. It has following research hypotheses as given below:
Conceptual Hypothesis:

H00. There is no significance difference between the academic achievements of 9th class students in social science taught by Inquiry-based teaching model and traditional teaching model.

Operational Hypotheses:

H01. a) There is no significance difference between the academic achievements of 9th class urban students & rural students in social science taught by Inquiry-based teaching model.
    b) There is no significance difference between the academic achievements of 9th class urban student & rural students in social science taught by traditional teaching model.

H02. a) There is no significance difference between the academic achievements of 9th class urban boys and urban girl students studying the social science taught by Inquiry-based teaching model.
    b) There is no significance difference between the academic achievements of 9th class urban boys and urban girl students studying the social science taught by traditional teaching model.

H03. a) There is no significance difference between the academic achievements of 9th class rural boys and rural girl students in social science taught by Inquiry-based teaching model.
    b) There is no significance difference between the academic achievements of 9th class rural boys and rural girl students in social science taught by traditional teaching model.

H04. a) There is no significance difference between the academic achievements of 9th class urban girl & rural girl students in social science taught by Inquiry-based teaching model.
    b) There is no significance difference between the academic achievements of 9th class urban girl & rural girl students in social science taught by traditional teaching model.

H05. There is no significance difference between the academic achievements of 9th class urban boy students in social science taught by Inquiry-based
teaching model & Traditional teaching model.

H06. There is no significance difference between the academic achievements of 9th class rural boy students in social science taught by Inquiry-based teaching model and traditional teaching model.

H07. There is no significance difference between the academic achievements of 9th class urban girl students in social science taught by Inquiry-based teaching model and traditional teaching model.

H08. There is no significance difference between the academic achievements of 9th class rural girl students in social science taught by Inquiry-based teaching model and traditional teaching model.

1.14 PLAN OF RESEARCH WORK

Table 1.1 Work Plan

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<td>Review of Literature</td>
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<td>Problem definition</td>
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The researcher had divided her work into following phases as given below:
• Review of Literature
• Problem definition
• Data Analysis
• Result & Conclusion

1.15 SCOPE OF RESEARCH

This research work is totally concentrated on inquiry-based teaching model in secondary schools. It implies the use of the inquiry-based teaching model which is capable of overcoming the limitations of the traditional teaching methods.

In this research study, the Inquiry-based teaching model is being used in secondary schools. This teaching model has emphasized on the students’ creativity. This model has improved the students’ willing to know about the concepts to be taught.

1.16 ORGANIZATION OF THESIS WORK

The organization of this thesis is as follows: -

• Chapter 1: The tradition teaching models and Inquiry-based teaching model has been described.
• Chapter 2: The review of literature of various teaching models has been described.
• Chapter 3: The plan and procedure of whole study has been described in detail.
• Chapter 4: The design of the research has been described in detail.
• Chapter 5: Data Analysis & hypothesis validation has been performed in this chapter.
• Chapter 6: Conclusions & contributions of this research work and the outline future work has been described.