Unit 2: Approaches to Scientific Inquiry

1. The Scientific Method: Definition, Key Characteristics, and Steps

Definition:

The scientific method is a **systematic and logical approach** to discovering how things in the universe work. It is a process that social scientists use to investigate social reality by using empirical evidence. According to **Karl Pearson**, "The scientific method is the method of all logically trained minds and is distinguished by its systematic and verifiable character."

In the field of **social research**, the scientific method allows researchers to make observations, develop explanations, and test these explanations by gathering empirical evidence.

Key Characteristics of the Scientific Method:

1. **Empiricism**:
   Knowledge is derived from **sensory experience** and observable phenomena. Social scientist **Auguste Comte**, the father of positivism, emphasized empirical observation as the foundation of sociology.

2. **Objectivity**:
   Research must be **free from personal biases**. It involves detachment and neutrality. **Max Weber** advocated for "value-free sociology," emphasizing that researchers must keep personal judgments aside during investigation.

3. **Systematic Observation**:
   Every stage—from problem identification to conclusion—is **methodical and structured**.

4. **Replicability**:
   The procedure and findings should be such that they can be **verified or reproduced** by other researchers.

5. **Falsifiability**:
   According to **Karl Popper**, a theory is scientific only if it is **capable of being refuted** through empirical testing. This principle distinguishes scientific knowledge from pseudoscience.

6. **Cumulative Knowledge**:
   Scientific inquiry builds upon **previous research** and contributes to the **accumulation of knowledge**.

Steps of the Scientific Method in Social Research:

1. **Identifying the Problem**
   The first step is to recognize and define the **research problem** clearly.
2. **Review of Literature**
   Surveying past studies and existing theories related to the topic.
3. **Formulation of Hypothesis**
   Based on prior knowledge or theory, a **testable statement or assumption** is developed.
4. **Research Design and Data Collection**
   Designing the method of study, choosing tools (interviews, surveys), and collecting relevant data.
5. **Analysis of Data**
   Use of **quantitative or qualitative tools** to interpret data. For example, statistical analysis for surveys.
6. **Interpretation and Conclusion**
   Examining the results in relation to the hypothesis, drawing conclusions, and suggesting implications.
7. **Reporting of Findings**
   Presenting findings in **research papers, reports, or presentations**, maintaining academic integrity and clarity.

2. Objectivity and Subjectivity in Research

Objectivity in Social Research:

Objectivity means that a researcher must strive to **eliminate personal biases, emotions, or values** from the research process. According to **Durkheim**, social facts must be studied as

"things"—independently of the individual's perception. Objectivity ensures **credibility, validity, and reliability** of the data.

Objectivity is particularly emphasized in **positivist methodologies**, where research is guided by the logic of the natural sciences.

Example: A study on crime rates should focus on measurable facts such as police reports and statistical trends rather than moral judgments.

Subjectivity in Social Research:

Subjectivity acknowledges the **researcher's perspective and interaction** with the subject. In many cases, especially in qualitative research, the presence of the researcher influences the outcome. According to **Weber**, understanding (Verstehen) of social action requires empathetic engagement with the actor's point of view.

Subjectivity is a vital component of **interpretive and critical approaches**, where **human meaning and context** are central.

Example: In a study of tribal rituals, understanding their significance requires immersion in the community's beliefs and narratives, not just counting occurrences.

Balancing Objectivity and Subjectivity:

In practice, **both objectivity and subjectivity** are necessary. While objectivity ensures rigor, **subjectivity provides depth and context**, especially when studying human emotions, motivations, and cultural experiences.

3. Deductive and Inductive Approaches to Research

Deductive Approach (From General to Specific)

The **deductive approach** begins with a **theory or hypothesis** and then moves to data collection and testing. It follows a **top-down logic**, where existing knowledge or assumptions are tested through observation.

- **Advocated by**: René Descartes, Karl Popper

- **Dominant in**: Quantitative research

Steps in Deductive Reasoning:

1. Begin with a **general theory or law**
2. Formulate a **hypothesis**
3. Collect **empirical data**
4. Test the hypothesis using data
5. Accept or reject the hypothesis

Example: From Durkheim's theory that social integration prevents suicide, a researcher may test whether married people have lower suicide rates than unmarried ones.

Inductive Approach (From Specific to General)

The **inductive approach** starts with **specific observations** and leads to the development of **general theories**. It follows a **bottom-up logic**, which is especially useful when exploring new or poorly understood phenomena.

- **Advocated by**: Francis Bacon, grounded theorists like Glaser & Strauss
- **Dominant in**: Qualitative research

Steps in Inductive Reasoning:

1. **Observe specific events or patterns**
2. Identify **recurring themes or categories**
3. Develop a **theory or conceptual framework**

Example: A researcher conducts interviews with migrant workers and, through repeated themes, develops a theory of "emotional displacement."

Comparison Between Deductive and Inductive Approaches

Criteria	Deductive Approach	Inductive Approach

Direction of Logic	General to Specific	Specific to General
Nature of Research	Testing of theory	Generation of theory
Research Type	Quantitative	Qualitative
Hypothesis	Formulated before research	Emerges after data collection
Use of Theory	Starts with theory	Ends with theory
Flexibility	Less flexible, structured	More flexible, open-ended