

Introduction to Research

Syllabus of Research Methodology

SYLLABUS – RESEARCH METHODOLOGY

- 1. Introduction to Research Methodology:** Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research
- 2. Defining the Research Problem:** What is Research Problem?, Selecting the Problem, Necessity of and Techniques in defining the problem
- 3. Sample Design:** Implication, Steps. Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design
- 4. Methods of Data Collection:** Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of an appropriate method for data collection, Case Study Method, Guidelines for developing a questionnaire, successful interviewing. Survey v/s experiment
- 5. Processing and Analysis of Data:** Measures of Central Tendency, Dispersion, correlation and Regression, Chi-square test: Applications, Steps, characteristics, limitations, Analysis of Variance and Co-variance
- 6. Testing of Hypothesis:** Meaning, Basic concepts, a Flow diagram, Power of a hypothesis test, Important parametric tests, Hypothesis Testing of Means, hypothesis testing of Correlation coefficients, Limitations of Tests of the hypothesis.

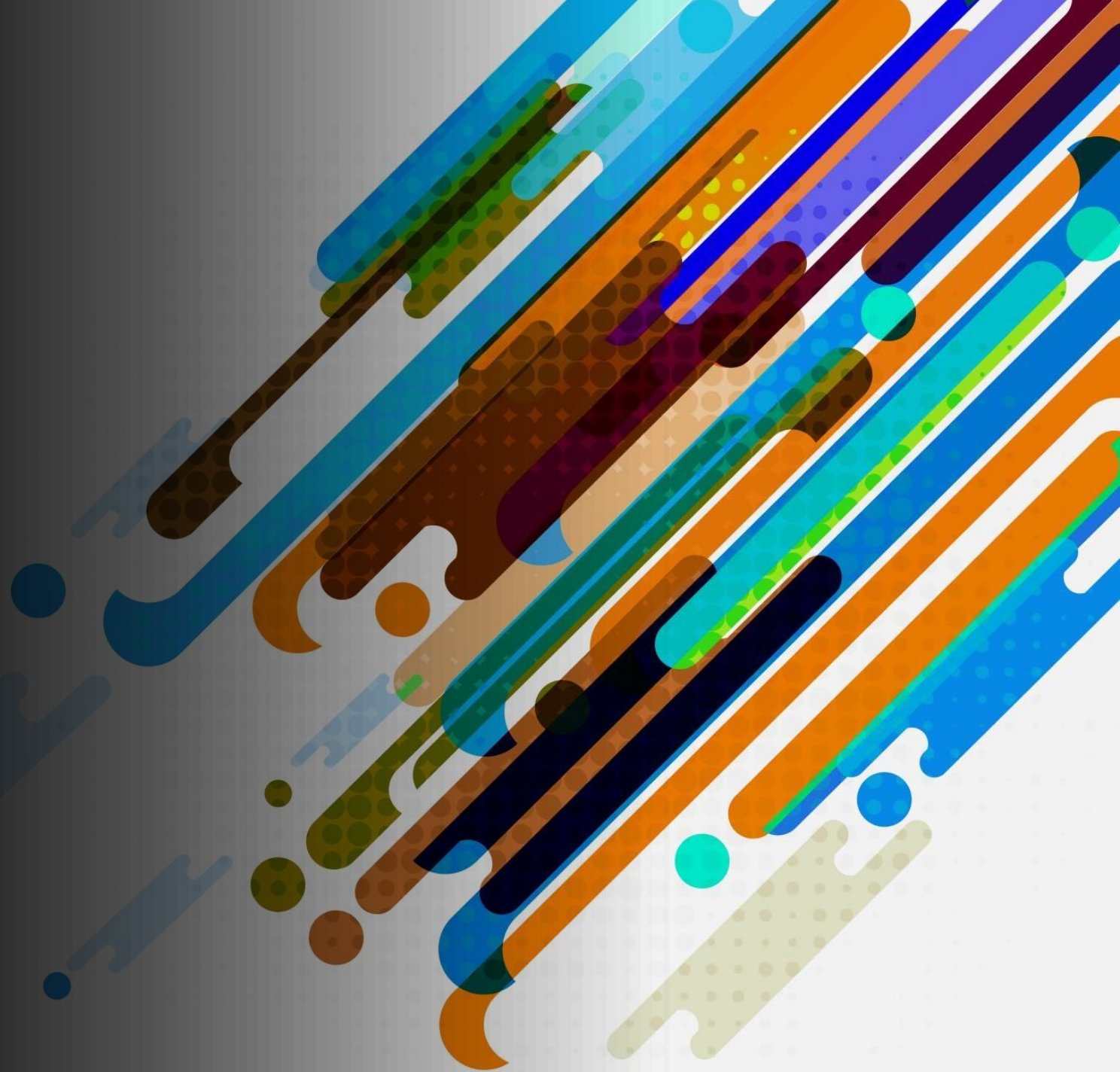
Reference Books

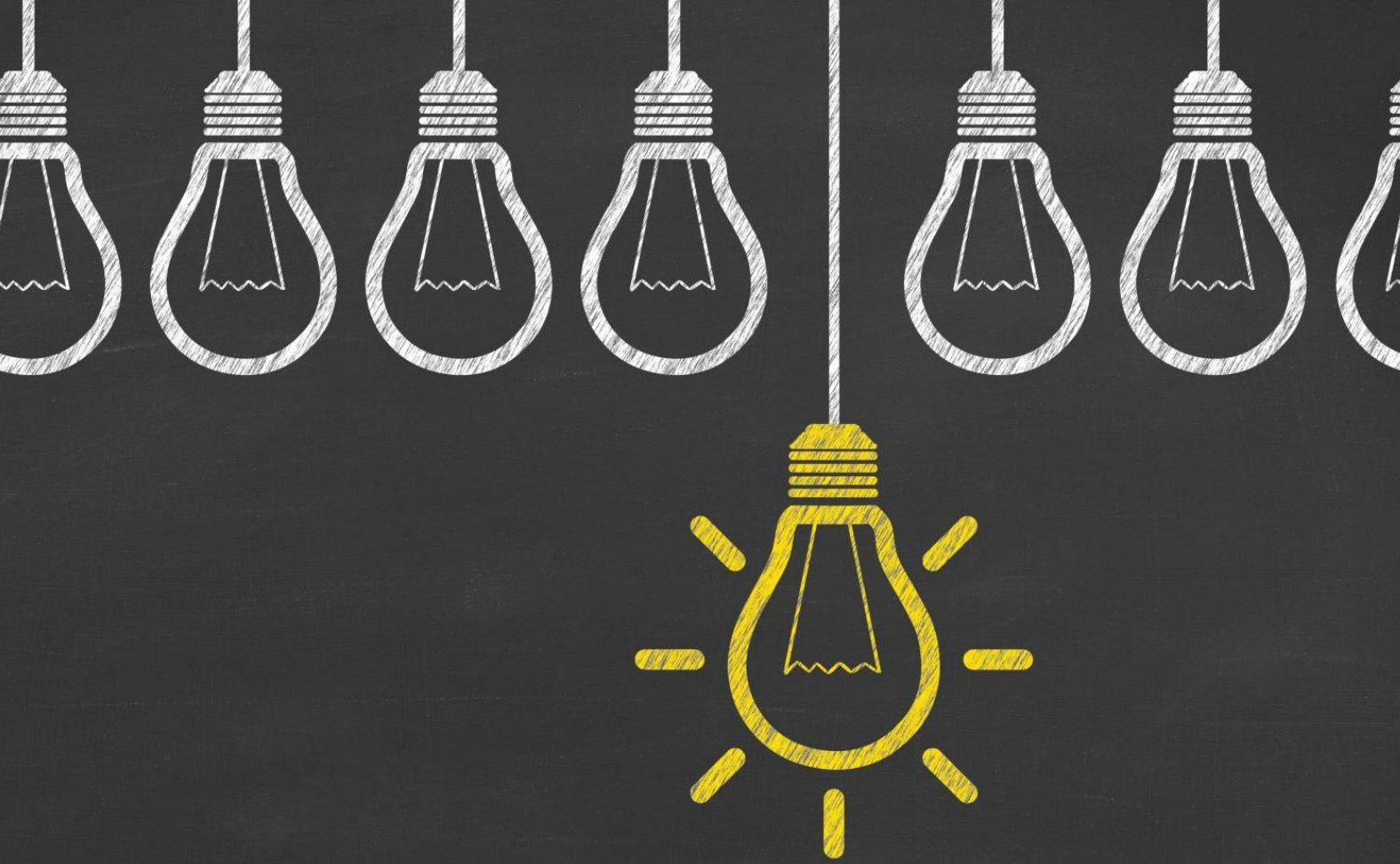
Latest Editions of following Books

1. Kothari, C.R., Research Methodology (Methods and Techniques), New Age Publisher
2. Fundamentals of modern statistical methods By Rand R. Wilcox
3. Power Analysis for Experimental Research A Practical Guide for the Biological, Medical and Social Sciences by R. Barker Bausell, Yu-Fang Li Cambridge University Press
4. Design of Experiments: Statistical Principles of Research Design and Analysis, by Robe



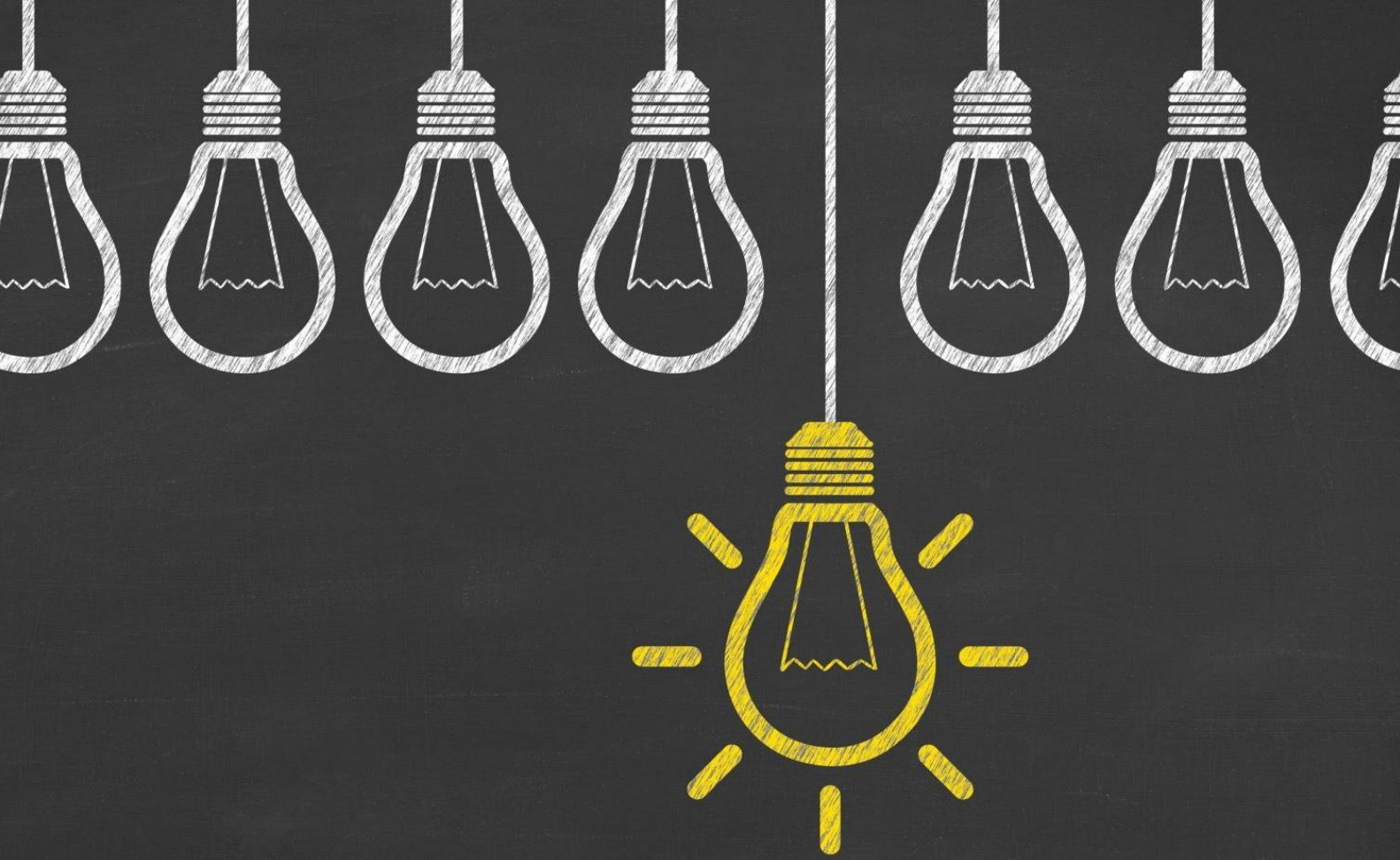
Introduction to Research Methodology





Meaning of Research

- Research refers to the systematic investigation of a subject or topic to discover new knowledge, validate existing knowledge, or solve a problem.
- It involves the collection, analysis, and interpretation of data to answer research questions or achieve research objectives.



Objectives of Research

1. To explore new phenomena, theories, or concepts
2. To verify existing theories or concepts
3. To provide practical solutions to real-world problems
4. To improve existing practices or processes
5. To generate knowledge that can be used for future research or development



Motivations in Research

1. Curiosity: The desire to explore and understand the unknown.
2. Practical needs: The need to address real world problems or improve existing practices.
3. Personal interest: Passion or interest in a specific field of study.
4. Academic requirements: Meeting the requirements of academic institutions or programs.
5. Professional development: Advancing knowledge and skills in a particular area.

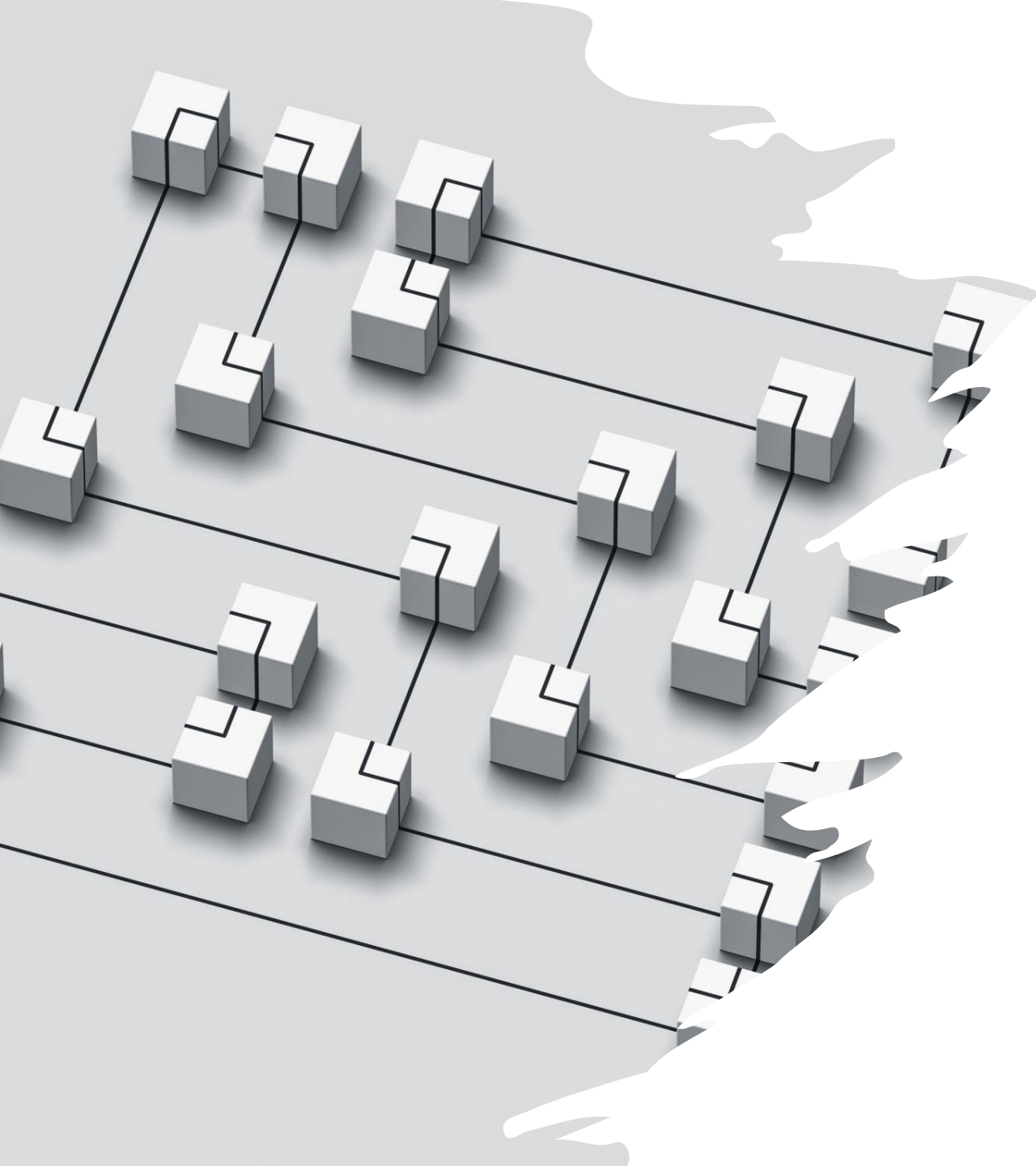


Types of Research

1. Basic Research: Investigates fundamental concepts and theories without immediate practical application.
2. Applied Research: Focuses on solving specific problems or meeting practical needs.
3. Quantitative Research: Collects and analyzes numerical data.
4. Qualitative Research: Collects and analyzes nonnumerical data, such as interviews, observations, or textual analysis.
5. Mixed Methods Research: Combines quantitative and qualitative approaches.

Research Approaches

1. Deductive Approach: Starts with a general theory or hypothesis and seeks to gather data to confirm or refute it.
2. Inductive Approach: Begins with observations or data and seeks to develop theories or generalizations based on those observations.
3. Experimental Approach: Manipulates variables to determine cause and effect relationships.
4. Observational Approach: Observes and analyzes phenomena without direct interference or manipulation.
5. Case Study Approach: In-depth examination of a specific case or phenomenon to gain detailed insights.



Significance of Research

1. Advances knowledge and understanding in various fields.
2. Provides evidence based information for decision making.
3. Contributes to the development of new theories, concepts, or technologies.
4. Improves existing practices, processes, or interventions.
5. Enhances problem solving capabilities in academia, industry, and society.

Research Methods vs. Methodology

- Research Methods: Specific techniques or tools used to collect, analyze, and interpret data (e.g., surveys, experiments, interviews).
- Research Methodology: The overall framework or approach that guides the entire research process, including the selection of methods, data collection, analysis, and interpretation.

Research and Scientific Methods

- Research is often conducted using scientific methods, which involve systematic and objective approaches to gather and analyze data.
- Scientific methods aim to ensure reliability, validity, and replicability of research findings.
- Research methods such as observation, experimentation, data analysis, and peer review are commonly used in scientific research.





Research Process

1. Identify the research problem or topic.
2. Review existing literature and research.
3. Formulate research questions or objectives.
4. Select appropriate research methods.
5. Collect and analyze data.
6. Interpret the findings.
7. Draw conclusions and make recommendations.
8. Communicate the research results through reports, presentations, or publications.



Criteria of Good Research

1. **Validity:** The research should measure what it intends to measure and produce accurate and reliable results.
2. **Reliability:** The research should yield consistent results if repeated under similar conditions.
3. **Replicability:** The research should be replicable by other researchers using the same methods and obtaining similar results.
4. **Objectivity:** The research should be conducted without bias or personal opinions influencing the findings.
5. **Generalizability:** The findings of the research should be applicable to a broader population or context.
6. **Ethical Considerations:** The research should adhere to ethical guidelines, ensuring the rights and wellbeing of participants are protected.
7. **Practicality:** The research should be feasible and provide practical value or applications.
8. **Relevance:** The research should address a significant problem or contribute to the existing knowledge in the field.