



Unit III

Research Problem, Research Question, Theoretical and Conceptual Framework

Concepts of Research Problem:

- **Introduction to Research Problem:**
- **Definition:**
 - A research problem is a specific issue, concern, or difficulty that requires investigation and resolution through a systematic research process.
- **Foundation of Research:**
 - The research problem is the cornerstone of the entire research endeavor. It dictates the direction, scope, and significance of the study.

Concepts of Research Problem:

- **Characteristics of a Good Research Problem:**

- 1. Clarity and Precision:**

- The problem statement should be clear, concise, and specific.
- Ambiguity can lead to vague research outcomes

- 2. Feasibility:**

- The research problem should be feasible within the available resources, time constraints, and ethical considerations.

- 3. Relevance:**

- The problem must be relevant to the field of study, contributing to the existing knowledge and addressing a gap or issue.

Concepts of Research Problem:

- **Characteristics of a Good Research Problem:**

4. Novelty:

- Ideally, the research problem should offer a novel perspective, introducing new insights or approaches to the subject matter.

5. Measurability:

- The variables within the research problem should be measurable and observable, ensuring the collection of reliable data.

6. Interest and Significance:

- The problem should be of interest to the researcher and the academic community, demonstrating significance in addressing broader issues.

Concepts of Research Problem:

- **Sources of Research Problems:**

- 1. Personal Experience:**

- Issues encountered in daily life or professional experiences can spark research ideas.

- 2. Literature Review:**

- Gaps and unanswered questions identified during a literature review can evolve into research problems.

- 3. Current Events:**

- Real-world events, societal changes, or emerging trends may prompt research questions.

- 4. Collaboration and Discussion:**

- Interactions with colleagues, experts, or mentors can lead to the identification of research problems.

Concepts of Research Problem:

- **Types of Research Problems:**

- 1. Descriptive Problems:**

- Involve describing the characteristics of a phenomenon without manipulating variables. Common in exploratory research.

- 2. Relational Problems:**

- Investigate the relationships between two or more variables. Aim to establish connections or correlations.

- 3. Comparative Problems:**

- Focus on comparing two or more groups or conditions to identify similarities, differences, or patterns.

- 4. Explanatory Problems:**

- Seek to explain the underlying reasons or causal relationships between variables.

Concepts of Research Problem:

- **Conclusion:**
- Understanding the concepts of research problems is foundational for any research endeavor.
- A well-defined and carefully chosen research problem sets the stage for a meaningful and impactful study, driving the entire research process.

Guiding Principles of Formulating Research Problem:

- **Introduction:**

- 1. Foundation of Research:**

- The formulation of a research problem is a critical step in the research process. It sets the direction, scope, and purpose of the study.

- 2. Significance:**

- A well-formulated research problem is essential for conducting meaningful and valuable research.

Guiding Principles of Formulating Research Problem:

- **Guiding Principles:**

- 1. Clarity and Precision:**

- **Definition:** The research problem statement should be clear, precise, and unambiguous.
- **Importance:** Clarity ensures that the research question is easily understood, reducing the likelihood of misinterpretation.

- 2. Feasibility:**

- **Definition:** The research problem should be feasible in terms of resources, time, and ethical considerations.
- **Importance:** Ensures that the study is practical and can be conducted within the available constraints.

Guiding Principles of Formulating Research Problem:

- **Guiding Principles:**

3. Relevance:

- **Definition:** The research problem should be relevant to the field of study, addressing a gap or contributing to existing knowledge.
- **Importance:** Enhances the significance of the research, making it valuable to the academic community and beyond.

4. Novelty:

- **Definition:** The research problem should offer a novel perspective or contribute new insights to the subject matter.
- **Importance:** Fosters innovation and ensures that the research adds something new to the body of knowledge.

Guiding Principles of Formulating Research Problem:

- **Guiding Principles:**

5. Measurability:

- **Definition:** Variables within the research problem should be measurable and observable.
- **Importance:** Facilitates the collection of reliable and valid data, ensuring the study's credibility.

6. Interest and Significance:

- **Definition:** The research problem should be of interest to the researcher and demonstrate significance in addressing broader issues.
- **Importance:** Motivates the researcher and increases the impact of the research within the academic community.

Guiding Principles of Formulating Research Problem:

- **Conclusion:**
- Understanding and applying the guiding principles in formulating a research problem is crucial for the success of any research endeavor. A well-crafted research problem aligns with these principles, ensuring clarity, feasibility, relevance, novelty, measurability, and significance, ultimately contributing to the quality and impact of the research.

Formulation of Research Questions and Objectives:

- **Steps in Formulating a Research Problem:**

- 1. Selecting a Broad Area:**

- Identify a general field of interest based on academic background, passion, or societal relevance.

- 2. Reviewing the Literature:**

- Conduct a thorough literature review to understand existing research, identify gaps, and refine the research problem.

- 3. Defining the Problem:**

- Clearly articulate the research problem, specifying the variables, scope, and context.

Formulation of Research Questions and Objectives:

- **Steps in Formulating a Research Problem:**

4. Narrowing the Scope:

- Refine the problem to a manageable size, considering the available resources and time constraints.

5. Formulating Research Questions or Hypotheses:

- Pose specific research questions or hypotheses that guide the study and address the research problem.

6. Seeking Feedback:

- Share the formulated research problem with peers, mentors, or experts to receive constructive feedback.

Formulation of Research Questions and Objectives:

- **Formulation of Research Objectives:**

- 1. Definition of Objectives:**

- Research objectives are specific, measurable, and achievable goals that the researcher aims to accomplish in the study.

- 2. Characteristics of Good Research Objectives:**

- Specific: Clearly define what the researcher intends to achieve.
- Measurable: Objectives should be quantifiable or observable.
- Achievable: Ensure that objectives are realistic and feasible within the study's scope.
- Relevant: Ensure that objectives are relevant to the study's scope.
- Time-bound: Set a timeframe for achieving each objective.

- 3. Example:**

- Research Objective: "To assess the impact of social media usage on the academic performance of university students over a one-year period."

Formulation of Research Questions and Objectives:

- **Linkage between Research Questions and Objectives:**

1. Alignment:

- Ensure a direct alignment between research questions and objectives.
- Questions guide the study, and objectives operationalize the achievement of research goals.

2. Example:

- Research Question: “What are the factors influencing employee job satisfaction in the IT industry?”
- Research Objective: “To identify and analyze the key factors influencing employee job satisfaction in the IT industry through a comprehensive literature review and empirical investigation.”

Formulation of Research Questions and Objectives:

- **Conclusion:**
- Formulating clear and focused research questions and objectives is foundational to the research design process.
- These elements provide a roadmap for the study, guiding researchers toward meaningful and achievable goals.
- The careful alignment between questions and objectives ensures a coherent and purposeful research endeavor.

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- **Introduction:**

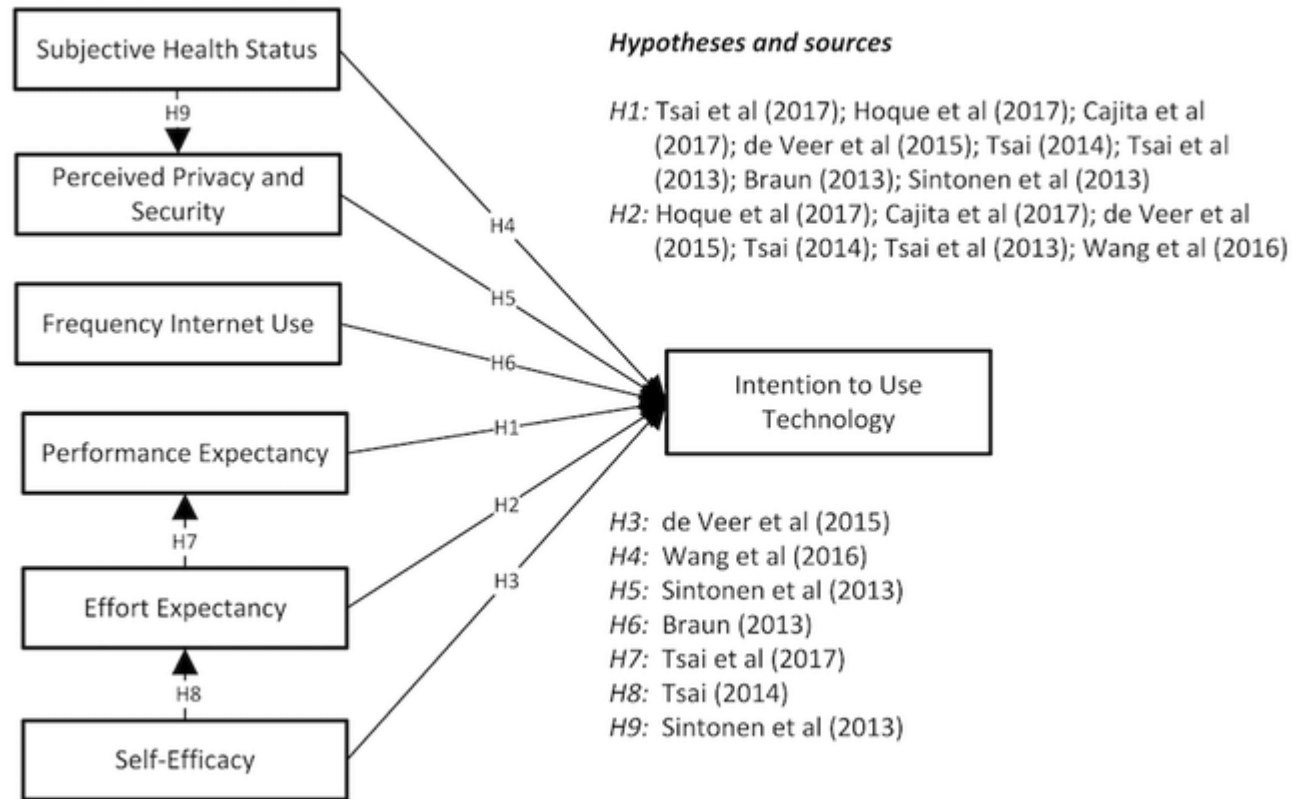
- In research, theory plays a crucial role in providing a framework for understanding, interpreting, and explaining phenomena.
- Theoretical and conceptual frameworks are essential components that guide the research process and shape its structure.

- **1. Theoretical Framework:**

- Definition: A theoretical framework is a structure of concepts, definitions, and propositions that presents a systematic view of relationships among variables, forming a basis for understanding and analyzing a phenomenon.
- Purpose:
 - To provide a foundation for hypothesis development.
 - To guide the collection and analysis of data.
 - To offer a coherent and logical explanation for observed patterns.

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- 1. Theoretical Framework:



- This framework displays the factors associated with older people's intention to use technology. Each hypothesis is based on prior research, as shown. H = hypothesis

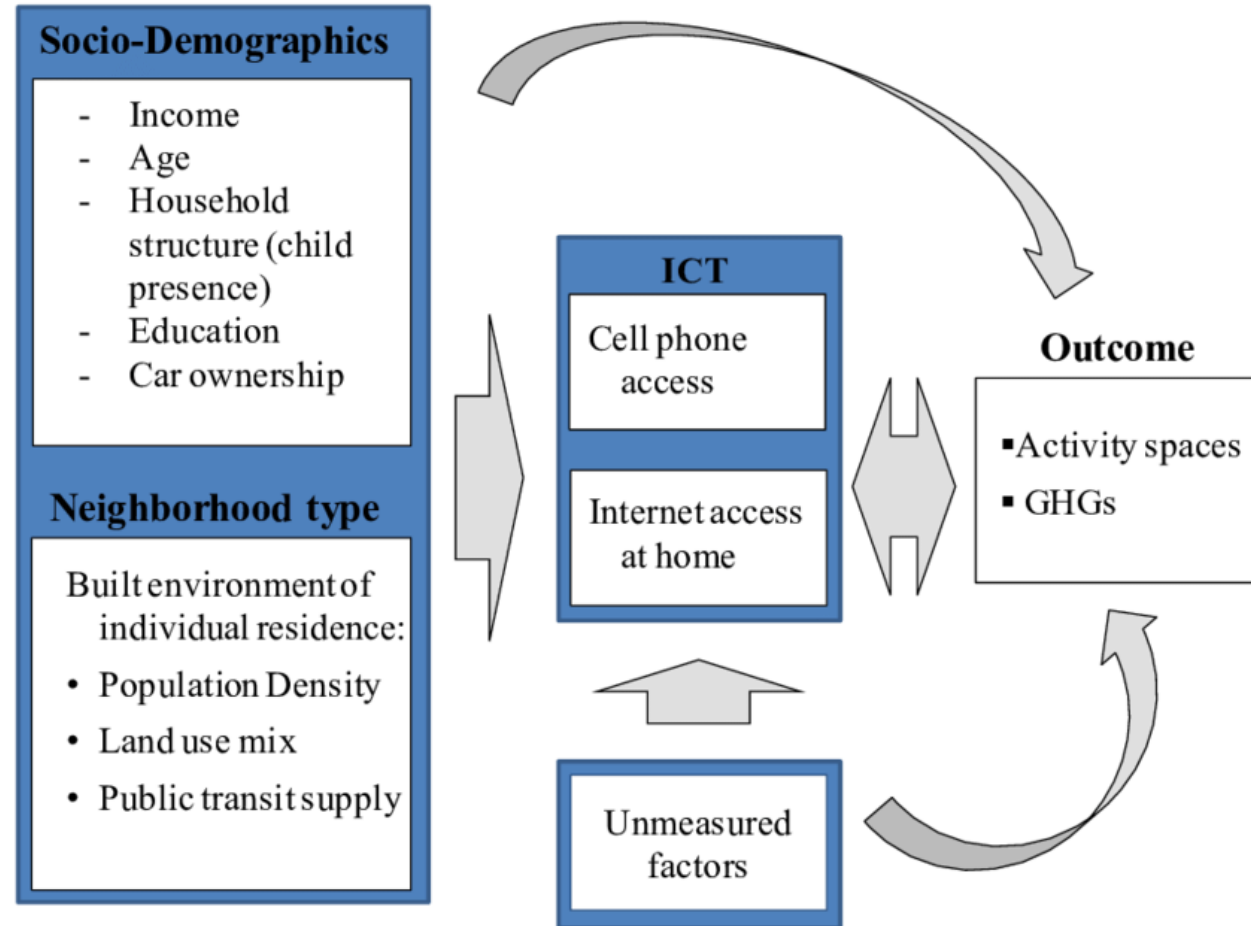
(Reference: https://www.researchgate.net/figure/Theoretical-framework-This-framework-displays-the-factors-associated-with-older-peoples_fig1_324262649)

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- **2. Conceptual Framework:**
- Definition: A conceptual framework is an analytical tool used to visualize the relationships between concepts, variables, or ideas within the study.
- Components:
 - *Concepts*: Abstract ideas representing class or category.
 - *Variables*: Measurable traits or characteristics.
- Function:
 - Clarifies the study's focus.
 - Guides the selection of variables.
 - Offers a roadmap for data analysis.

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- 2. Conceptual Framework:



- Conceptual framework-link between ICT and travel outcomes

(Reference: https://www.researchgate.net/figure/Conceptual-framework-link-between-ICT-and-travel-outcomes_fig3_254426937)

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- **3. Role of Theory in Research:**

- Guiding Research Design:

- Theory shapes the overall design of a study, influencing the selection of methods and data collection techniques.

- Providing a Rationale:

- Theoretical frameworks justify the study by explaining why the chosen variables are important and how they relate to one another.

- Hypothesis Formulation:

- Theoretical perspectives contribute to the development of hypotheses, predicting relationships between variables.

Theory: Theoretical framework, Conceptual framework, Role of theory in research

- **3. Role of Theory in Research:**

- Interpretation of Findings:
- Theory aids in interpreting research findings, allowing researchers to draw meaningful conclusions.
- Generalizability:
- A well-founded theoretical framework enhances the generalizability of research findings.

- **Conclusion:**

- In summary, theory, whether theoretical or conceptual, serves as a roadmap for researchers, guiding their study design, hypothesis formulation, and interpretation of results. A strong theoretical foundation contributes to the robustness and credibility of research endeavors.

Deduction and Induction

- **Introduction:**
- Deduction and induction are two fundamental methods of reasoning in research and philosophy.
- They represent distinct approaches to drawing conclusions from evidence.
- **1. Deduction:**
- Definition: Deduction involves deriving specific conclusions from general principles, theories, or premises.
- Process:
- Starts with a general statement or hypothesis.
- Applies this general principle to specific cases to reach a more detailed and specific conclusion.
- Example:
- All humans are mortal (general premise).
- Socrates is a human (specific case).
- Therefore, Socrates is mortal (specific conclusion).

Deduction and Induction

- **2. Induction:**
- Definition: Induction involves deriving general principles or theories from specific observations or cases.
- Process:
- Begins with specific instances or examples.
- Draws general conclusion that is likely but not certain.
- Example:
- The sun has risen every morning in the past (specific observations).
- Therefore, the sun will likely rise tomorrow morning (general conclusion).

Deduction and Induction

- **3. Comparison:**
- Nature of Reasoning:
 - Deduction is a top-down reasoning process, moving from general to specific.
 - Induction is a bottom-up reasoning process, moving from specific to general.
- Certainty:
 - Deductive reasoning aims for certainty; if the premises are true, the conclusion is certain.
 - Inductive reasoning provides probable, but not absolute, conclusions.

Deduction and Induction

- **4. Strengths and Limitations:**

- Deduction:

- Strengths: Offers certainty, logical structure.
- Limitations: Relies heavily on the accuracy of premises, may not be applicable in all situations.

- Induction:

- Strengths: Reflects real-world uncertainty, allows for flexibility.
- Limitations: Conclusions are not guaranteed, vulnerable to counterexamples.

Deduction and Induction

- **5. Research Applications:**

- Deductive Research:
- Often used in quantitative research.
- Testing hypotheses derived from established theories.

- Inductive Research:
- Common in qualitative research.
- Generating theories or concepts based on observed patterns.

- **Conclusion:**

- Deduction and induction represent complementary approaches in research, each with its strengths and applications. Researchers often use a combination of these methods depending on the nature of their study and the questions they seek to answer. Understanding these reasoning processes is fundamental for sound research design and analysis.

Concept of Hypothesis

- **Introduction**
- A hypothesis is a fundamental element in the scientific method, serving as a testable statement that predicts the outcome of a research study.
- It provides a logical structure for investigation, guiding the research process from design to analysis.
- **1. Definition of Hypothesis:**
- Definition: A hypothesis is a clear, specific, and testable statement that predicts the relationship between variables or the outcome of an experiment.
- Purpose:
- Provides a basis for empirical investigation.
- Guides the researcher in formulating research questions.

Concept of Hypothesis

- **2. Types of Hypothesis:**

- Null Hypothesis (H_0): Assumes no effect or relationship; any observed difference is due to random chance.
- Alternative Hypothesis (H_1): Assumes a specific effect or relationship; what the researcher aims to support.
- Directional vs. Non-Directional Hypotheses:
 - Directional: Predicts the direction of the effect (e.g., positive or negative)
 - Non-Directional: Predicts the existence of an effect without specifying its direction.

Concept of Hypothesis

- **3. Hypothesis Formulation:**

- Observation: Begins with observation of a phenomenon or pattern.
- Research Question: Develops into a research question that guides hypothesis formulation.
- Variables: Identifies the independent and dependent variables.
- Testable Statement: Converts the research question into a clear, testable statement.
- Null and Alternative Hypotheses: Formulates the null hypothesis (H_0) and alternative hypothesis (H_1).

Concept of Hypothesis

- **4. Good Criteria for Hypothesis Formulation:**

- Clarity and Specificity: Clearly states the expected relationship or effect.
- Testability: Allows for empirical testing through data collection and analysis.
- Falsifiability: The hypothesis should be capable of being proven false.
- Relevance: Addresses the research question and aligns with study objectives.
- Logical Consistency: The hypothesis should be logically consistent with existing knowledge.
- Scope: Defines the scope and boundaries of the study.

Concept of Hypothesis

- **5. Examples:**

- Null Hypothesis (H_0): There is no significant difference in test scores between Group A and Group B.
- Alternative Hypothesis (H_1): Group A will perform significantly better than Group B in test scores.

- **6. Research Applications:**

- Experimental Research: Hypotheses guide the experimental design and the manipulation of variables.
- Observational Research: Hypotheses guide the collection and analysis of observational data.

Concept of Hypothesis

- **Conclusion:**
- The concept of a hypothesis is central to the scientific method, providing a structured and testable foundation for empirical research.
- Proper formulation, guided by good criteria, enhances the reliability and validity of research findings.
- Researchers use hypotheses to make predictions, test theories, and contribute to the cumulative knowledge in their respective fields.