

Lesson 2

Research Problem and Hypothesis

CS 411
Thesis 1



A problem is:



- any significant, perplexing and challenging situation, real or artificial, the solution of which requires reflective thinking
- a perplexing situation after it has been translated into a question or series of questions that help determine the direction of subsequent inquiry.

A Research Problem is:



- A ***research problem*** is a specific issue, concern, or gap in knowledge that a researcher intends to investigate and solve through a scientific study.
- According to research methodology, a research problem serves as the guiding focus of the entire research process because it determines the objectives, methodology, data collection, and analysis procedures.



Characteristics of a Good Research Problem

1. Clear
2. Researchable
3. Significant
4. Feasible
5. Ethical



Sources of Research Problem

1. Academic Literature
2. Industry Needs
3. Personal Observation
4. Government and Institutional Policies



Elements of a Research Problem:

1. Aim or purpose of the problem for investigation. (“Why?”)
2. The subject matter or topic to be investigated (“What?”).
3. The place or locale where the research is to be conducted. (“Where?”)
4. The period or time of the study during which the data are to be gathered. (“When?”)
5. Population or universe from whom the data are to be collected (“Who?” or “From whom?”)

Variables in Research



The term *variable* is commonly used in educational and social science research.

It refers to the properties that shall be the focus of the study. These are the properties that are to be measured and where, relationships are tested.

1. **Independent Variable (IV)** - the factor believed to influence another variable
2. **Dependent Variable (DV)** - the outcome being measured

A Research Hypothesis



- A *hypothesis* is a tentative statement that predicts a relationship between variables and can be tested statistically.
- It is an educated guess based on theories, observations, or previous studies.



Types of Hypothesis

1. **Null Hypothesis (H_0)** - states that there is no significant relationship or difference between variables.
2. **Alternative Hypothesis (H_1)** - states that a significant relationship or difference exists.



Characteristics of a Good Hypothesis

1. Clear
2. Testable
3. Specific
4. Based on Theory
5. Measurable

Hypothesis Testing



1. Descriptive Statistics

- Mean
- Frequency
- Percentage
- Standard Deviation

2. Inferential Statistics

- t-Test
- ANOVA
- Chi-Square Test
- Pearson Correlation
- Regression Analysis



Remember:

1. A research problem identifies the issue or gap that needs investigation.
2. The Statement of the Problem converts the issue into answerable research questions.
3. Variables must be clearly identified before developing hypotheses.
4. A hypothesis is a testable prediction about relationships or differences among variables.
5. Null hypotheses are commonly used in quantitative BSCS and BSIT research.
6. Strong research begins with a well-defined problem and logically derived hypotheses.