

Lesson 3

Types of Research and Research Methododology

CS 411
Thesis 1



Types of Research



A. According to Purpose

1. *Basic Research* (Pure Research) - aims to expand existing knowledge and develop theories without immediate practical application.

Characteristics:

- Theory-oriented
- Generates new knowledge
- Academic in nature



2. *Applied Research* - seeks solutions to real-world problems.

Characteristics:

- Practical application
- Problem-solving focus
- Direct societal benefit



B. According to Approach

1. *Quantitative Research* - involves numerical data and statistical analysis.

Characteristics:

- Uses surveys and questionnaires
- Large sample sizes
- Statistical testing



2. *Qualitative Research* - focuses on understanding experiences, perceptions, and behaviors.

Characteristics:

- Uses interviews and focus groups
- Small sample sizes
- Narrative data



3. *Mixed Methods Research* - combines quantitative and qualitative approaches.

Characteristics:

- Provides comprehensive understanding
- Uses both numerical and narrative data
- Allows triangulation



Types of Research Design

1. **Descriptive Research** - describes current conditions, behaviors, or characteristics.

It describes what is. It involves the description, recording, analysis, and interpretation of the present nature, composition or processes of phenomena, The focus is on prevailing condition.

2. **Correlational Research** - examines relationship between variables.

3. **Comparative Research** - compares two or more groups.
4. **Experimental Research** - determines cause-and-effect relationships.



It is a problem-solving approach that describes the effect when certain variables are carefully controlled or manipulated. It focuses on the past, present, and future conditions.

Characteristics:

- Control group
- Experimental group
- Manipulation of variables

5. Developmental Research - focuses on designing and developing systems, applications, or technologies.



Phases:

- Analysis
- Design
- Development
- Testing
- Evaluation

6. Evaluation Research - assesses effectiveness of programs, systems, or technologies.

7. Action Research - a decision-oriented research involving the application of the steps of the scientific method in response to an immediate need to improve existing practices.

What is Research Methodology?

Research Methodology refers to the systematic approach used by researchers to conduct a study. It includes the methods, procedures, techniques, and tools used to collect, analyze, and interpret data.



Research methodology includes:

- Research design
- Sampling techniques
- Data gathering procedures
- Research instruments
- Statistical treatments
- Ethical considerations

Common Research Methodologies in BSCS/BSIT:



A. System Development Research - used when creating software systems

Common Models:

- Waterfall Model
- Agile Model
- Rapid Application Development (RAD), etc.



B. Design Science Research (DSR) - creates and evaluates technological artifacts.

Artifacts

- Software
- Models
- Frameworks
- Algorithms



C. **Action Research** - researchers solve problems while participating in the environment being studied.

Cycle

- Plan
- Act
- Observe
- Reflect