

# Research Methodology

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# What is Research Methodology?

- Is defined as a highly intellectual human activity used in the investigation of nature and matter and deals specifically with the manner in which data is collected, analyzed and interpreted

# How to Select a Research Topic?

- Personal interest
- Social problem
- Testing theory
- Prior research
- Program evaluation
- Human service practice
- Minorities in research

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# What Constitutes a Research Topic?

- Unanswered question
- Unsolved question
- Concern
- Query
- Statement of inquiry

# **What are some of the Limitations Encountered when Doing or Thinking of Doing a Research Project?**

- Time constraints
- Financial consideration
- Anticipating and avoiding problems
- Equipment limitations
- Human resource limitations

# What is a Literature review?

- Systematic review of available resources
  - Theoretical and conceptual concepts
  - Identification of independent and dependent variables
  - Measurement and operational definitions
  - Selection of appropriate research technique
  - Sampling strategy
  - Statistical technique
  - Findings and conclusions of similar studies studied



# Where do I find Sources of Information for my Literature Review?

- Books
- Journals
- Internet
- Data bases
- Archives
- Interviews
- Observations
- Reports
- Records

# How to Select an Appropriate Methodology?

- What is the nature of the problem being investigated?
- Is the problem being investigated subjective or objective?
- Four types of research methods:
  - Qualitative
  - Quantitative
  - Mixed (qualitative and quantitative)
  - Critical and action oriented

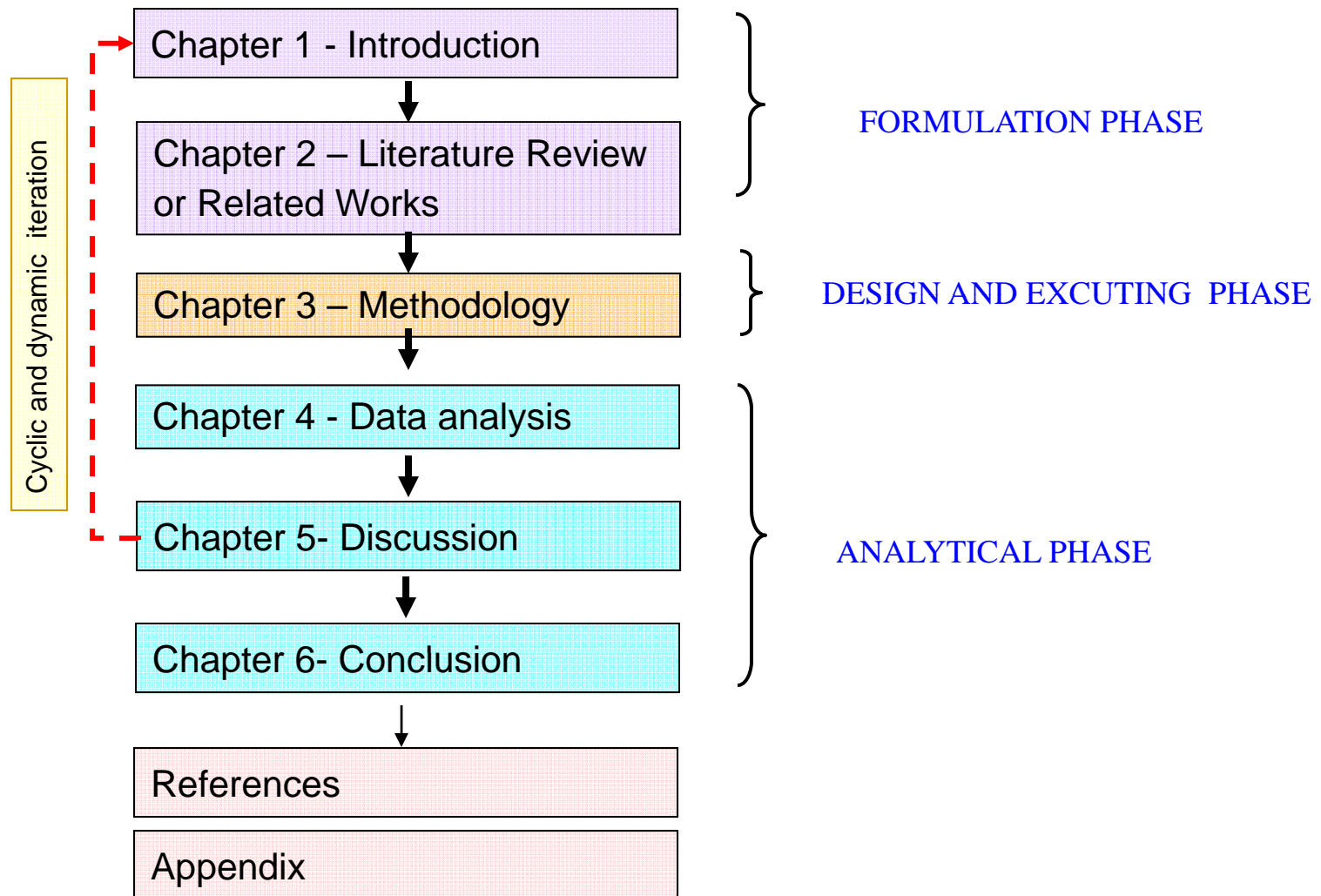
# What are some of the Common Types of Qualitative Methodology?

- Surveys
- Longitudinal
- Cross-sectional, correlation
- Experimental
- Quasi-experimental
- Ex-post facto research

# What are some of the Common Types of Quantitative Methodology?

- Biographical
- Phenomenological
- Ethnographical
- Case study

# Common Research Process



# Formulation Phase

Confirm need – Review literature - Define the problem – Develop questions and objectives – specify hypotheses – Develop theoretical model

## Chapter 1 introduction

- 1.1 Introduction
- 1.2 Problem background
- 1.3 Problem statement
- 1.4 Research questions
- 1.5 Objective
- 1.6 Scope
- 1.7 Significant of the study

To guiding



## Chapter 2 literature review

- 1.1 introduction
- 1.2 Definition of the terms (concepts)
- 1.3 Logical flow of ideas
- 1.4 Unbiased and comprehensive view of the previous research on the topic.
- 1.5 Identify areas of controversy in the literature
- 1.6 Doing a first Assessment on related works
- 1.7 Identify gaps based on first assess
- 1.7 explain about your proposes method

# Problem statement , Research Question, and Hypotheses

lead to formulate  
research question/s



■ **A problem statement is:** a clear concise description of the issues that need to be created addressed and presented by the researcher.

lead To formulate  
Hypotheses



**A research question is:** a statement that identifies the phenomenon to be studied. It must define the domain , the variables, and its relationship

**A hypotheses is:** a specific statement of prediction. It describes in concrete (rather than theoretical) terms what you expect will happen in your study.

# Design and Execution Phase

It design based on: How the results will be achieve - How data will be collect - How data will be analyzed

- **1. Research Design**
- **1.1 Research Approach (i.e. type of the research)**
- **1.2 Research Method (qualitative/ quantitative / mix-method)**
- **3. Data collection**
- **3.1 Quantitative data collection**
- **3.1.1 Survey (questionnaire)**
- **3.1.1.1 Instrumentation**
- **3.1.1.2 Pilot test**
- **3.1.1.3 Sample size**
- **3.1.2 Experimental apparatuses**
- **3.2 Qualitative Data Collection**
- **3.2.1 Interview / Documents / Observation**
- **4. Data analysis**
- **4.1 Quantitative data analysis (objective )**
- **4.1 Qualitative data analysis (subjective )**
- **5. External validity**
- **6. Reliability**



# Analytical Phase

**Data analysis is the processing of interpretation findings that looking at summarizing data with the intent to extract useful information and develop conclusions**

## Qualitative data analysis

(Interpretation of words and text)

- Qualitative data analysis describes and summarizes the mass of words generated by interviews or observational data. It allows researchers to seek relationships between various themes that have been identified
- Qualitative data analysis often contain content analysis that leads to emerge of themes and patterns.

## Quantitative data analysis

(Interpretation of numerical data)

- Quantitative data analysis often contain descriptive statistics and inferential statistics

1) Descriptive statistics include measures of central tendency

2) Inferential statistics is a set of measurements can be regarded as

measurements on a sample of items from a population Thus, it make inferences about the population from the sample.

# Analytical Phase

- **Discussion of findings**

- Discussion in relating to literature
- Discussion in relating to research objectives
- Discussion in relating to research questions
-

# Analytical Phase

## ■ Conclusion

Conclusions are often the most difficult part to write  
Conclusion is often what a reader remembers best

## ■ Elements of conclusion

- **Answer the question "So what?"**  
*(important of your thesis)*
  
- **Synthesize, don't summarize**  
*(Don't simply repeat things that were in your thesis)*
  
- **Create a new meaning**  
*(Create a new picture )*

# Some important concepts

# Variable

- **Variable**  
Is a term ascribed to the characteristic being investigated, and can take any value in a reasonable range.
- For example, Internet Bandwidth, Type of Cables, and bandwidth measurement being studied.

## Independent variable

*The variable which is assumed to determine the values of the dependent (response) variable. For example, blood pressure could be deemed to respond to changes in age.*



## Dependent variable

*The variable which is assumed to respond to the values of the independent (explanatory) variable. For example, blood pressure could be deemed to respond to changes in age.*

# Unit of Analysis

Units of analysis are the persons, things, or events under study--the entities that we want to say something about.

Frequently, the appropriate units of analysis are easy to select.

# Triangulation

A research design that includes two or more approaches to data collection or analysis

# What Type of Data to Collect?

- **Categorical**
  - nominal-observations that can be coded
  - ordinal-observations that can be ranked
- **Continuous**
  - observations that can be counted or measured
- **Mixed**
  - matrix of categorical and continuous data



# How to Collect Data?

- Observations
- Interviews
- Reports
- Records

# How to Analyze Data?

- Need to consider the type of data collected
  - categorical
  - continuous
  - mixed

# How to Draw Conclusions from Data?

- Use of graphical presentations
- Use of statistical analyses
- Sharing data among colleagues and receiving constructive feedback
- Critically analyzing data and results

# How to Present Research Findings?

- Tables-matrix of rows and columns representing variables
- Figures-visual organization of data/observations
  - pictures
  - pie charts
  - line charts
  - bar charts
  - flow charts
  - organizational charts
  - cartogram charts
  - Gantt charts
  - scatter plot charts

# General Format of References

LASHKARI, A. H., MANAF, A. A., MASROM, M. & DAUD, S. M. 2011. Security Evaluation for Graphical Password. *The International Conference on Digital Information and Communication Technology and its Applications (DICTAP2011)*. University de Bourgogne, France: “Communications in Computer and Information Science” (CCIS) Series of Springer LNCS.

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# Appendices

The first question is - appendix or appendices?

*Appendix is singular and appendices is plural!*

Appendices are used when the incorporation of material in the body of the work would make it poorly structured or too long and detailed.

Appendices may include some of the following:

- **supporting evidence**
- **contributory facts**
- **specialized data - raw data will appear in the appendix, summarised data will appear in the body of the text**
- **technical figures, tables or descriptions**
- **detailed description of research instruments**
- **maps**
- **questionnaires (although questionnaire results appear in the body of the text)**

Appendices must be referred to in the body of the text, for example, 'details of the questionnaire are given in Appendix A (Page 12)'.

**THANK YOU**

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**THE END**