

RESEARCH METHODOLOGY LAB ESSENTIALS

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Abstract:

Research Methodology: Lab Essentials is a comprehensive guide designed to walk researchers through the various stages of conducting research, both quantitative and qualitative. It provides practical lab sheets and instructions for each step of the research process, ensuring that researchers have a solid foundation to plan, execute, and report their studies effectively. This book introduces the fundamental concepts of research, distinguishing between quantitative and qualitative methodologies. It lays the groundwork for the research journey ahead. It continues with selecting a research topic that guides researchers on how to effectively search for existing literature and information relevant to their research using Mendeley software. Then, problem statement formulation helps researchers clarify and refine their research problem, setting the stage for focused inquiry. This book also comprises of labs on LR Matrix aids in the development of a literature review matrix to synthesize existing research and formulate focused research questions and conceptualize and operationalize the variables. It also covers labs on designing the study for survey and interview and collecting data. After obtaining the data, this book includes labs regarding analyzing and interpreting quantitative and qualitative data. Lastly, reporting style offers guidance on how to effectively communicate research findings, including the structure and style of research reports.

Keywords: Research Methodology, Quantitative and Qualitative Research, Literature Review Matrix, Data Collection and Analysis & Research Reporting



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UTM



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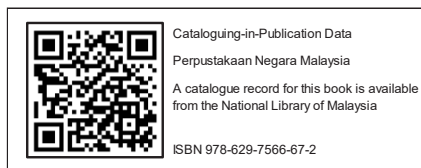
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PREFACE

"Research Methodology: Labs Essentials is simple guide for novice researchers. It is especially designed to guide the undergraduate students to start their research journey by picking the right topic, designing study, collecting data, analyzing it, and sharing your findings with others. This book uses simple terms, so you won't feel lost in the world of research.

We've included practical lab sheets and clear instructions to make things even easier. Think of these lab sheets as your trusty maps and tools for your research expedition. They'll help you stay on the right track and get the job done.

Remember, research is an adventure where you get to explore, discover, and make a difference. So, let's get started on this exciting journey together. Put on your thinking cap, and let's dive into the world of "Research Methodology: Labs Essentials."

Happy researching!

CHAPTER 1

Overview of Research Process

Chapter Outline

Chapter 1 introduces pertinent research processes to ensure research's rigor. Although quantitative (QUAN) and qualitative (QUAL) research processes are different in terms of approaches, they mostly consist of similar activities. This chapter describes each QUAN and QUAL research processes to assist novice researchers to make sense of what research processes that are similar, and which are different.

Learning Objectives

After completing this chapter, student will be able to:

- 1.1 Understand QUAN research processes.
- 1.2 Understand QUAL research processes.
- 1.3 Differentiate the QUAN and QUAL research processes.

Chapter Overview

QUAN research process involves several steps, each crucial in ensuring a systematic and valid investigation as shown in Figure 1.1.

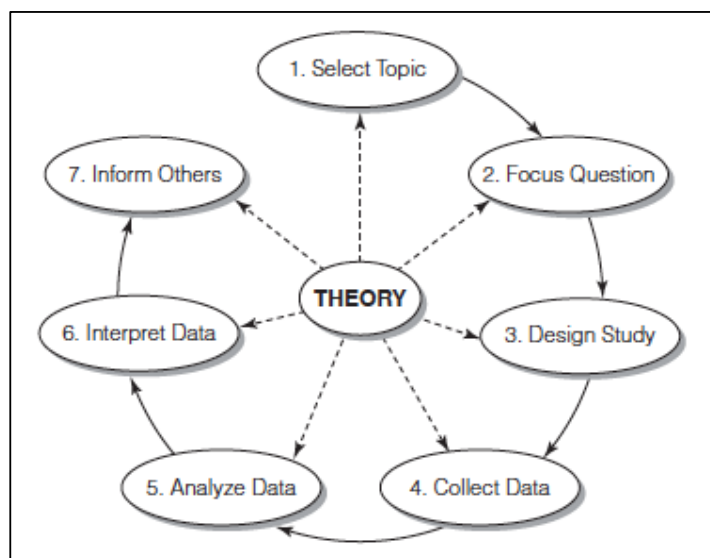


Figure 1.1: Steps in the Quantitative Research Process

CHAPTER 2

Information Searching

Chapter Outline

Chapter 2 introduces researchers to the process and stages of conducting social research. Specifically, it explains steps by steps of information searching using various databases such as Scopus, Emerald, Google Scholar and others. It includes how to use appropriate key words in information searching using the databases. These databases become the initial point for the researchers to understand how to search the right information pertaining to their research. Lastly, this chapter describe ways to perform in text citation and in reference list using APA style.

Learning Objectives

After completing this chapter, student will be able to:

- 2.1 Explains steps by steps of information searching using databases.
- 2.2 Use appropriate key words in performing the information searching.
- 2.3 Describe the types of citation from difference sources, including in text citation and in reference list.

Types of Data Sources

Typically, there are two main types of data sources, referring to primary data and secondary data. Primary data are records that are original in character, where researcher obtains first hand for achieving objectives of the study (Sekaran & Bougie, 2016; Kothari, 2004). Primary data can be collected through several ways such an interviews, questionnaires and experiments. The questionnaires development will be explained in details, in Chapter 7: Survey Research Design, while the following Chapter 8 will explains on interviews research design.

In contrast to primary data, secondary data are those data obtained secondary sources such as online records, library repositories and Systemetic Literature Review (SLR). Secondary data is a resource used to reinforce understanding of an idea that can be found in a journal, thesis, report, and encyclopedia. Other sources for secondary data are book and magazines, past records, documents and newspaper. Figure 2.1 illustrates examples of secondary data with brief explanation of its functions.

CHAPTER 3

Reference Management

Chapter Outline

Chapter 3 introduces the method of using Mendeley Reference Manager along with the reference format used in UTHM thesis writing. The citation format and referencing style have an impact on the entire thesis writing and scientific paper produced. Various formats also slow down the writing process if it is done manually without the help of tools that can speed up the writing process and organize the reference list in a more orderly manner and can be run automatically.

Accordingly, several tools for managing reference lists are available on the market. Among the popular ones used are Mendeley, EndNote, Zotero and various other tools. For the practical purposes of this chapter, the tool used is Mendeley. In this chapter, students will be introduced to how to use Mendeley starting from the installation process until generating the reference list and choosing the right citation format according to the university's thesis format.

Learning Objectives

After completing this chapter, student will be able to:

- 3.1 Use the Mendeley Reference Manager for academic writing purposes in accordance with the university format.
- 3.2 Understand how Mendeley works and how to reference / cite using Mendeley.
- 3.3 Use the web importer function as well as merging the citations in Mendeley.

Reference Management

Referencing is a scientific method of defining a data source by providing a standard set of data that makes it simple to identify, search for, and retrieve the data. While a bibliography lists all relevant sources, regardless of whether they were cited or not, referencing only includes the sources of information that are specifically cited in a research paper. Authors use in-text citations to support their claims and show how various studies are related, allowing readers to compare and contrast the findings. IEEE, APA, and Harvard styles are among the many scholarly referencing formats that are frequently used in social sciences and technical engineering studies.

The wide range of reference categories, data fields, and formatting styles is one of the main drawbacks of referencing. Numerous sources, including journal articles, complete books, book sections, conference proceedings and papers, dissertations and theses,

CHAPTER 4

Problem Statement Formulation

Chapter Outline

Chapter 4 introduces students to the main components of research problem writing as well as the characteristics of a good problem statement. Students were also exposed to the importance of problem statements in research as well as the steps of writing problem statements.

“Problem statements lead the reader from a shared context to the perception of a problem, and on to a proposed solution”.

Learning Objectives

After completing this chapter, student will be able to:

- 4.1 Identify problem areas that are likely to be studied in organizations
- 4.2 Construct problem statement for the research
- 4.3 Narrow down a broad problem statement into feasible topic for research

Problem Statement Overview

A common statement which defines the issue upon which research is to be conducted, is known as a research problem. A proper research problem is a well-defined, empirically supported, real-world problem faced by specific individuals or organizations that have negative implications to parties involved. Thus, the defining characteristics of problem statement are as follows;

- Specific - Specific to the context and study's scope. However, it should be manageable and directed at the study's goals.
- Evidence-based: The issue must be well-researched and supported by statistics or facts that can be proven. Anecdotal evidence, or a statement based on an opinion, is ineligible. Evidence that is both quantitative and qualitative can be incorporated into the formulation of the problem statement. However, in the context of business management and the social sciences, quantitative evidence is more preferred.

CHAPTER 5

Literature Review Matrix

Chapter Outline

Chapter 5 focuses on how to develop literature review matrix and to use it for identification of empirical gaps.

Learning Objectives

After completing this chapter, student will be able to:

- 5.1 Understand the purpose of developing a literature review matrix
- 5.2 Demonstrate the ability to read and map literature in the matrix table
- 5.3 Critically analyze past literatures.

Chapter Overview

Conducting a systematic literature review involves a structured and rigorous process to identify, select, analyze, and synthesize relevant research studies on a specific topic. The following steps describe the details.

1. Specify Inclusion and Exclusion Criteria:

When you are searching for relevant studies, you would come across thousands of studies from various sources. To better manage your searching activities, it is important to specify specific criteria for including or excluding studies. One of the most important inclusion criteria is to select only studies that have similar dependent variables. For example, loyalty can be a dependent variable (DV – the effect) or independent variable (IV-the effect) in a study. If you were to choose studies related to loyalty as DV, exclude all studies that regard loyalty as IVs. This type of strategy could help you tremendously in managing the literature. Other factors that can be used as inclusion or exclusion criteria include publication date and study design. The rule of thumb is to focus on the past five years of studies and extend the period of publications if the availability of studies is very limited. If your research has only two variables (1 IV and 1 DV), it is acceptable to include studies that have more than these two variables, as long as the DV is the same. You can also include only study that use either QUAN or QUAL approach. This would help you to be more focused and justify the hypothesis development.

CHAPTER 6

Conceptualization, Operationalization & Hypotheses Formulation

Chapter Outline

Chapter 6 describes the process of conceptualization and operationalization. These two important concepts are often used together when designing research methodology. They refer to different stages in the research process and involve defining and translating abstract concepts into concrete terms for measurement. Hypotheses formulation could only be done correctly if conceptualization and operationalization are linked at theoretical and empirical levels.

Learning Objectives

After completing this chapter, student will be able to:

- 6.1 Understand the conceptualization process.
- 6.2 Understand the operationalization process
- 6.3 Differentiate conceptualization and operationalization processes
- 6.4 Demonstrate the ability to develop hypotheses.

Chapter Overview

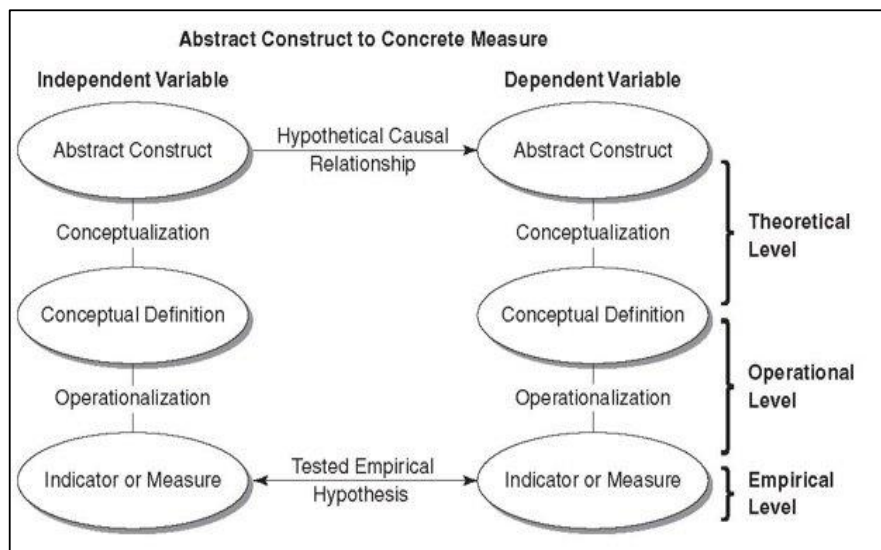


Figure 6.1: Conceptualization and Operationalization

CHAPTER 7

Survey Research Design

Chapter Outline

Chapter 7 explains the research design. Questionnaire research is one of the most frequently used methods, especially in the field of management and business. In this chapter, various types of surveys are introduced along with the survey process. Despite the broad-based societal acceptance of survey research, there remains a lingering doubt, especially within the general population at large, concerning the reliability of information derived from relatively few respondents purporting to represent the whole. Therefore, understanding the advantages, the correct process and method in the development of a survey greatly affects the results of the findings and needs to be compatible with the objective of the study to be achieved.

Learning Objectives

After completing this chapter, student will be able to:

- 7.1 Understand the role of research design and survey design in research
- 7.2 Adapt the survey design process in completing the research activities
- 7.3 Identify the strength and weaknesses of survey design

Survey Research Design

A survey is an approach for collecting information from or about people to ascertain individuals' attitudes, beliefs, opinions, or their reporting of their experiences and/or behaviors. Surveys rely on asking people standardized questions that can be analyzed statistically. They allow researchers to collect a breadth of data from large samples and generalize to the larger population from which the sample was drawn. The survey strategy is very popular in social science and business research, because it allows the researcher to collect quantitative and qualitative data on many types of research questions. Indeed, surveys are commonly used in exploratory and descriptive research to collect data about people, events, or situations. For instance, in a business context, surveys are often taken on consumer decision making, customer satisfaction, job satisfaction, the use of health services, management information systems, and the like. The questions in survey instruments are typically arranged into self-administered questionnaires that a respondent completes on his or her own, either on paper or via the computer. Other survey instruments are interviews and structured observation.

CHAPTER 8

Interview Research Design

Chapter Outline

Chapter 8 discusses research design specifically related to interview. In details, this chapter begins with the overview of interview research design, types of interviews and followed by tips for interviewing. This chapter also highlights the stages in interview, including question techniques in probing during interview session and how to design interview protocol. Lastly, this chapter explains six interview bias.

Learning Objectives

After completing this chapter, student will be able to:

- 8.1 Discuss how to design interview, its types and tips for interviewing.
- 8.2 Explains the stages in designing interview.
- 8.3 Design interview protocol in obtaining the data collection.

Overview of Interview

Typically, there are two types of data sources referring to primary and secondary data. The primary data can be obtained first-hand by the researcher related to the variables of interest from individuals, focus group or respondents and most popular sources from questionnaires (quantitative) and interview (qualitative). Meanwhile, the information that can be gathered from the existing sources is known as secondary data. This secondary data can be obtained from company records, reports, and industry analyses.

An interview is generally a qualitative research technique that involves asking open-ended questions to converse with respondents and collect elicited data about a subject. The interview session aims to obtain participants' experiences, understandings, opinions, or motivations regarding subject of interest.

Types of Interview Questions

There are two main types on interview questions refer to structured and unstructured interview questions as illustrated in Figure 8.1.

CHAPTER 9

Data Collection

Chapter Outline

Chapter 9 describes data collections techniques for both QUAN and QUAL research. It is one of the most challenging steps in both types of research as it is not only time consuming but also costly in certain cases.

Learning Objectives

After completing this chapter, student will be able to:

- 9.1 Describe QUAN data collection techniques
- 9.2 Describe QUAL data collection techniques
- 9.3 Explain the ethics of data collection
- 9.4 Demonstrate the ability to collect data effectively

Chapter Overview

Depending on their research questions, objectives, and the characteristics of the phenomenon they are studying, researchers frequently decide between QUAN and QUAL data collection methods. To understand a research problem more thoroughly in some cases, mixed methods research combines the two approaches. Research methods called quantitative (QUAN) data collection methods are used to collect numerical data for statistical analysis. These techniques are frequently used in empirical research to methodically gather and quantify data, allowing researchers to reach unbiased conclusions and generalize about a population. Quantitative (QUAN) and qualitative (QUAL) data collection methods have several crucial differences:

1. Data Type
The main goal of quantitative methods is to gather numerical data. Data can be statistically analyzed and is measured in terms of quantities. On the other hand, qualitative methods gather information that is not numerical, such as text, audio, or visual data. This information has a descriptive and narrative tone.
2. Research Purpose
Usually, cause-and-effect relationships, patterns, and hypotheses are tested using quantitative methods. They strive to be applicable to larger populations.

CHAPTER 10

Quantitative Data Analysis (Fundamental of SPSS)

Chapter Outline

Chapter 10 explains fundamental of SPSS, including detail steps by steps in importing data, data screening, and several data analysis for both descriptive and inferential analyses.

Learning Objectives

After completing this chapter, student will be able to:

Describe processes in analyzing quantitative data using SPSS software by,

10.1 getting data ready for analysis

10.2 preparing the data file

10.3 getting feel for the data

10.4 examining different types of statistical techniques in SPSS software.

Overview of SPSS

In SPSS, there are **FIVE (5)** main views, referring to (1) Data editor window, (2) Viewer window, (3) Pivot table editor, (4) Chart editor window and (5) Syntax.

1. Data Editor Window

Data Editor Window is the Data Editor window displays the contents of data file, where it can be open, save and close existing data files, create a new data file, enter data, make changes to the existing data file, and run statistical analyses as depicted in Figure 10.1 and Figure 10.2.

CHAPTER 11

Qualitative Data Analysis (Interview)

Chapter Outline

Chapter 11 focuses on qualitative research analysis (often for in-depth interview) called thematic analysis. It is a flexible and systematic approach that allows researchers to gain a deep understanding by uncovering patterns, trends, and insights from the underlying meanings, experiences, and perspectives of participants in their own words. These in turn, can be an input for theory development, policy decisions, or further research.

Learning Objectives

After completing this chapter, student will be able to:

- 11.1 Understand thematic analysis process
- 11.2 Understand how to ensure the rigor, trustworthiness, and validity of thematic analysis
- 11.3 Differentiate thematic analysis from other types of qualitative data analysis

Chapter Overview

Thematic analysis applied to the in-depth interviews consists of several steps as follows:

1. Data collection

Thematic analysis begins with the collection of qualitative data, often through in-depth interviews. These interviews conducted with participants can provide valuable insight into the research question or topic.

For example, you have conducted in-depth interviews with a diverse group of customers who are loyal to train services. These interviews are audio-recorded and later transcribed for analysis.

2. Transcription

After conducting the interview, the recordings or notes will be converted into writing. This step is important because thematic analysis is based on the analysis of textual

CHAPTER 12

The Research Report

Chapter Outline

Chapter 12 begins with the importance of preparing well-written research report in informing the audience the research results. Firstly, the report needs to include issues or problems that motivate the researcher to conduct the research. From these issues or problems, then research questions and research objectives will be developed. Secondly, the research reports also need to include literature review on subject of interest and highlights the development of framework. Next, the process of designing the research need to be reported including process of data collection. Fourthly, the data will be analyzed and the results will be reported. Lastly, the researcher need to do interpretation and justification of obtained results. It is also important that the results of the study and the recommendations for solving the problem are objectively and effectively communicated to the sponsor, so that the suggestions made are accepted and implemented. Writing the report concisely, convincingly, and with clarity is perhaps as important as conducting a rigorous research study. Indeed, a well-thought-out written report and oral presentation are critical.

The exact contents and organization of both modes of communication – the written report and the oral presentation – depend on the purpose of the research study, and the audience to which it is targeted. The relevant aspects of the written report and oral presentation are discussed in this chapter.

Learning Objectives

After completing this chapter, student will be able to:

- 12.1 Describe the characteristics of a well-written research report that is tailored to the needs of a specific audience.
- 12.2 Write a thorough and complete research report.
- 12.3 Describe the characteristics of a well-written report

As a researcher, you will communicate the findings of your study to others through a research report after you already complete with all the process of doing a study. A research report is a written document (or oral presentation based on a written document) that communicates the methods and findings of a research project to others. It is more than a summary of findings; it is a detailed record of the research process. Typically, there are five main chapters to report the findings of the study. These chapters referring to:

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BIOGRAPHIES



Shazaitul Azreen Rodzalan is a senior lecturer at UTHM with six years of working experience in teaching various courses such as Research Methodology, Organizational Behavior and Strategic Management. Her research interest including skills, training, human resource, and leadership. She has expertise in quantitative data analysis, including mixed methodology.



Nor Hazana Abdullah is an Associate Professor at UTHM for the past 17 years, teaching various courses from Human Research Management, Organizational Behavior, Industrial Psychology and Research Methodology. Prior to that, she had been working as an HR practitioner applying Research Methodology in real cases for 10 years. Her expertise is on quantitative data analysis although she prefer mixed methodology in most instances.



Nor Aziati Abdul Hamid is currently a fulltime senior lecturer and Principal researcher for Industry Centre of Excellence for Railway. She has experience in teaching for two decades in postgraduate and graduate level for Research Methodology course at Faculty of Technology Management and Business, UTHM. Her research interests include System Assurance, Operation Management, Information System and Business Analytics. Dr. Nor Aziati served as member of the various association and also the journal editor for the faculty.

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