

Research Methods and Statistical Techniques

(Theory)

MLIS-109

A Textbook for the Master of Library and
Information Science (M.Lib.I.S.)

As per the Prescribed University Syllabus

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Preface

Research is the engine by which Library and Information Science advances, and the ability to read research critically and to conduct it competently is now expected of every graduate of the discipline. This book has been written to teach the research methods and statistical techniques prescribed in the MLIS-109 syllabus to the depth the examination demands and the standard a professional career requires.

The book is organised in four units that follow the syllabus exactly. Unit I establishes the concept of research, the hypothesis, the research proposal and the review of literature, and the reporting and ethics of research. Unit II treats the research methods, from the scientific method and Ranganathan's spiral through the historical, experimental, descriptive, survey, and case study methods to bibliometrics and its laws. Unit III covers the tools of data collection: the questionnaire, the interview, observation, and sampling. Unit IV develops the statistical techniques: the tabulation and graphical presentation of data, the measures of central tendency, the chi-square test, and an orientation to SPSS and sociometry.

Three commitments shape every chapter. The first is accuracy: every fact has been checked against authoritative sources, and every calculation has been recomputed, so that the worked numericals can be trusted and reproduced. The second is originality: the prose is written throughout in the book's own voice, and the figures are drawn afresh for print. The third is teaching: each topic is opened with a definition, developed point by point, illustrated with figures and worked examples, and closed with a self-assessment that mirrors the university question pattern, so that the book serves the first-time learner, the reviser, and the examination candidate alike.

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Course Objectives

The objectives of this course are:

1. To introduce students to the concept of the Research.
2. To provide an insight into the Research Methods in Library and Information Science.
3. To provide an overall understanding of Statistical Techniques in Research Operations.

Course Outcomes

Upon successful completion of this course, the students will be able to:

1. Understand the various concepts related to research and its types.
2. Know the different methods used to conduct research.
3. Understand the importance of significant tools and techniques used in conducting research.
4. Understand the basic concept of statistical techniques.

Syllabus

Unit	Topics
I	Research a) Meaning, Need and Process of Research b) Types of Research – Fundamental and Applied c) Hypothesis: Definitions, Functions and Types d) Designing Research Proposal e) Literature Search – Print, Non-Print and Electronic Sources f) Research Reporting: Types, Structure and Contents g) Ethical aspects of research
II	Research Methods a) Spiral of Scientific Method (S. R. Ranganathan) b) Historical Method c) Experimental Method d) Descriptive Method e) Survey Method and Case Study Method f) Bibliometrics: Concept and Definition; Bibliometrics Laws – Bradford, Zipf, Lotka; Bibliographic Coupling and Citation Analysis; Webometrics; Impact factors
III	Research Techniques and Tools a) Questionnaire b) Interview c) Observation d) Sampling Techniques
IV	Descriptive Analysis and Interpretation a) Descriptive Statistics – Measures of Central Tendency: Mean, Mode, Median b) Chi-Square test c) Introduction to SPSS statistical software d) Tabulation e) Graphical presentation of data: Bar, Pie, Line-graphs, Histograms f) Sociometry

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Chapter 1. Foundations of Research: Meaning, Need, Process and Types

Learning outcomes

After studying this chapter the student will be able to:

- 1. Define research and state its essential characteristics with reference to standard authorities.*
- 2. Explain the need for and objectives of research, and locate research within Library and Information Science.*
- 3. Describe the research process as an ordered sequence of stages and represent it as a flow diagram.*
- 4. Classify research on the accepted bases and distinguish fundamental from applied research.*
- 5. Compare quantitative and qualitative research and select the appropriate orientation for a stated problem.*

1.1 Introduction

Research is the systematic, controlled, and critical investigation of a question whose answer is not already known, carried out so that the answer can be trusted and repeated by others. The word carries two ideas at once: a search, and a re-search, an inquiry patient and careful enough to be conducted again. What separates research from ordinary enquiry is not the subject but the discipline of the method: a problem stated precisely, evidence gathered by a declared procedure, and a conclusion that follows from the evidence rather than from preference. A librarian who counts yesterday's footfall has gathered a fact; a librarian who asks whether extended evening hours raise the use of the reading room, frames that question as a testable proposition, collects attendance under stated conditions, and interprets the figures against a stated expectation, has done research.

For the student of Library and Information Science (LIS) the subject matters twice over. The discipline is itself young and still building its evidence base, so the profession depends on graduates who can both read research critically and conduct it competently. This chapter establishes the vocabulary and the map: what research is, why it is undertaken, the sequence of steps through which it proceeds, and the recognised categories into which it falls. Every later chapter, whether it treats a method (Unit II), a data-collection tool (Unit III), or a statistical technique (Unit IV), is best understood as a stage or an instrument within the process set out here.

1.2 The meaning and definition of research

Research admits no single sentence that captures it fully, so it is best approached through the definitions of those who have shaped its understanding, each of which foregrounds one essential feature.

- 1. Clifford Woody* describes research as an activity that comprises defining and redefining problems, formulating a hypothesis or suggested solution, collecting, organising and