



MCA

Literature Review

Purpose, Importance, Types, and
Searching Literature , Organizing, Analyzing,
Writing, and Identifying Gaps and [China](#)

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LECTURE 4



Agenda

- 1. Purpose and Importance of Literature Review**
- 2. Types of Literature Sources**
- 3. Searching and Locating Relevant Literature**
- 4. Organizing and Analyzing Literature**
- 5. Writing a Literature Review**
- 6. Identifying Research Gaps**
- 7. Real-life Examples and Case Studies**
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Purpose and Importance of Literature Review

Definition: A comprehensive summary of previous research on the topic.

Eg: Studying the opponents boxing style to compete better.

Purpose:

- Understand the current state of knowledge.
- Identify gaps and inconsistencies.
- Provide context and background for new research.
- Avoid duplication of previous work.

Importance of Literature Review

Foundation for Research: Establishes a solid foundation for your study.

Contextual Understanding: Provides context and understanding of the research area.

Informs Methodology: Helps in selecting appropriate research methods.

Identifies Gaps: Highlights gaps that your research can fill.

Types of Literature Sources

Primary Sources: Original research articles, patents or lengthy research papers like theses(report), and dissertations (phd or doctorate).

Secondary Sources: Review articles, books, and systematic reviews.

Tertiary Sources: Encyclopedias, dictionaries, and handbooks.

Example: A primary source on AI might be a research paper on neural networks, while a secondary source could be a review article on AI applications.

Searching and Locating Relevant Literature

Databases: Google Scholar, PubMed, IEEE Xplore, JSTOR(Journal Storage).

Keywords: Use relevant keywords and phrases.

Boolean and other Operators: AND, OR, NOT , IN to refine searches.

Example: Searching for literature on "AI AND music composition."

Real-life Example: AI in Music

- **Primary Source:** A research article on using AI to compose music.
- **Secondary Source:** A review article discussing various AI techniques in music composition.
- **Tertiary Source:** An encyclopedia entry on the history of AI in the arts

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Organizing and Analyzing Literature

Categorizing Sources: Thematically, chronologically, or methodologically. ([Review paper pneumonia](#))

Critical Analysis: Evaluate the quality, relevance, and significance of each source.

Example: Organizing literature on AI in music by different AI techniques (e.g., neural networks, genetic algorithms).

Example: Organizing Literature on AI in Music

- **Thematic Organization:** Group studies by AI techniques.
 - Neural Networks
 - Genetic Algorithms
 - Reinforcement Learning
- **Chronological Organization:** Group studies by publication date.
 - 2010-2015
 - 2016-2020
 - 2021-Present

Thematically:

- **Definition:** Grouping sources based on themes or topics they address.
- **Example:** If you are researching cybersecurity in digital devices, you might categorize sources under themes like "threat detection," "encryption techniques," "user behavior," and "regulatory frameworks."
- **Purpose:** This helps in identifying common ideas, trends, and gaps in the literature, allowing for a more focused and coherent discussion on specific aspects of your research topic.

Chronologically:

- **Definition:** Arranging sources in the order of their publication dates.
- **Example:** If your research involves the evolution of cybersecurity measures, you could organize your sources from the earliest publications on the topic to the most recent.
- **Purpose:** This approach helps to trace the development of ideas and technologies over time, showing how the field has progressed and identifying historical trends and shifts in understanding or approaches.

Methodologically:

- **Definition:** Categorizing sources based on the research methods they use.
- **Example:** In a study on cybersecurity, sources could be divided into categories such as "qualitative studies," "quantitative analyses," "case studies," and "experimental research."
- **Purpose:** This categorization helps in comparing and contrasting different research methods, understanding the strengths and limitations of various approaches, and identifying which methods are most commonly used or most effective for studying

Writing a Literature Review

Structure:

- **Introduction:** Define the topic and scope.
- **Body:** Summarize and analyze the literature.
- **Conclusion:** Highlight key findings and gaps.

Tips:

- Maintain a clear and logical flow.
- Use subheadings to organize sections.
- Provide critical analysis, not just a summary.

Example: Writing a literature review on the psychological effects of social media.

Real-life Example: Writing a Literature Review

Topic: The impact of AI on job automation.

- **Introduction:** Overview of AI and job automation.
- **Body:** Summarize studies on different industries.
- **Conclusion:** Discuss key findings and future research directions.

Identifying Research Gaps

Definition: Areas where existing research is lacking or inconsistent.

Methods:

- Look for under-researched topics.
- Identify conflicting results.
- Note limitations in existing studies.

Example: Finding gaps in literature on AI ethics.

Reverse chronological order of gap analysis on thunderstorm forecasting

Sr No	Year of Publishing	Title	Methodology	Key Features	Gap Analysis
1	2021	Thunderstorm climatology over the Indian regions	Multiscale Analysis of satellite Images	Radiometric data processing, Clustering algorithm	Lack of comparison with other satellite based classification techniques
2	2018	Simulation of location specific severe thunderstorm using high resolution and data assimilation	Data Assimilation Techniques	Land Data Assimilation Numerical Weather Prediction	Limited study on uncertainty quantification
3	2017	Prediction and classification of thunderstorms using ANN	ANN with Backpropagation	Multilayer Perceptron with backpropagation	Lack of study on ensemble models
4	2016	A machine learning approach to finding skillful predictor combinations for short range forecasting	Unsupervised Machine Learning	Clustering Algorithms , Skillful prediction and identification	Did not fully used utilized all unsupervised approaches eg : Hierarchical Clustering

QUIZ

Question 1: Which of the following is a primary source?

- a) Review article
- b) Research article
- c) Encyclopedia entry
- d) Textbook

QUIZ

Question 2: What is the main purpose of a literature review?

- a) To provide a summary of current knowledge
- b) To publish new research findings
- c) To sell research products
- d) To criticize previous research

QUIZ

Question 3: Which method can help in identifying research gaps?

- a) Reading only abstracts
- b) Analyzing conflicting results
- c) Focusing on well-researched topics
- d) Ignoring limitations of studies

Summary

Purpose, importance, types of literature, searching, organizing, analyzing, writing, and identifying gaps.

Importance of conducting a thorough literature review to inform and guide your research.

