Ph.D Contact Classes

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Literature Review and Tools for Literature Management

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Syllabus

Literature Review: Concepts, Theories, and Techniques

Systematic Reviews and Meta-Analyses

Tools for Literature Management: EndNote, Zotero and Mendeley

Outline

- What is Research
- Major phases of the research process
- How to start research ?
- Literature Review
- Need of Literature Survey
- Preparing to Search
- Sources of Literature
- Journal Articles
- The top list of academic research databases
- How to evaluate a Journal?
- Books/ Theses
- Evaluate and Analyze the Literature
- Importance of documentation
- Scientific Search Engines Used In Literature Survey
- Tips for Improving Your Citation Metrics
- Tips for Improving Your Citation Metrics
- Systematic Reviews and Meta-Analyses
- Tools for Literature Management

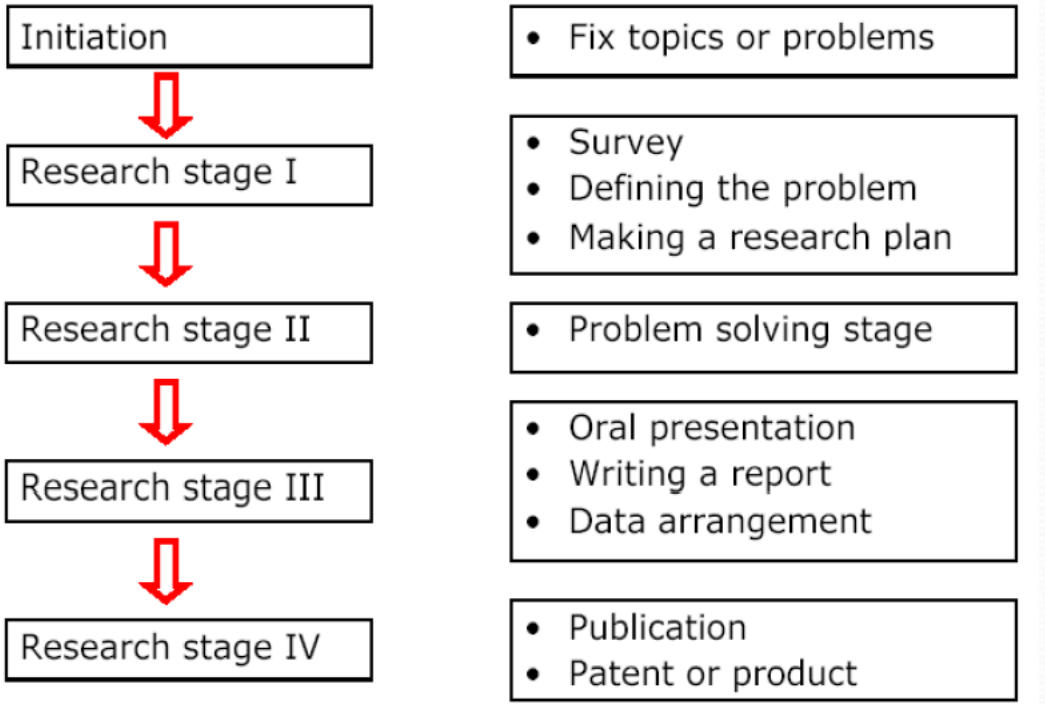
Objectives

- Understand the purpose of a literature review.
- Explore key concepts and theories associated with literature reviews.
- Learn effective techniques for conducting a literature review.
- Learn the step-by-step process for conducting systematic reviews.
- Explore the significance of meta-analyses in research
- Understand the importance of literature management tools.
- Learn key features of EndNote, Zotero, and Mendeley.
- Compare their functionalities to choose the right tool for your research needs.

What is Research?

- An attempt to find a new thing or improving the existing one
- The term Research is related to seek out the information and knowledge on a particular topic or subject. In other words, research is an art of systematic investigation.
- Necessity is mother of all the inventions and the person engaged in this scientific investigation can be termed as research.

Major phases of the research process (Contd.,)



Structuring Your Paper

Abstract

Introduction:
•Contextualize the research problem.
•Present your research question or thesis.

Literature Review:
•Summarize existing research.
•Identify gaps or limitations that your research addresses.

Methodology:
Describe your research design, data collection, and analysis methods.

Results/Findings:
Present data or key discoveries clearly and systematically.

Discussion:
Interpret findings. Discuss implications, limitations, and future research.

Conclusion:
Summarize key takeaways. Propose applications or follow-up studies.

What is a Literature Review?

- A **critical evaluation** of existing research related to a specific topic.
- Involves summarizing, analyzing, and synthesizing information.
- Forms the foundation for academic research by identifying gaps and setting the context.

Need of Literature Survey

- What approaches have others used?
- What are the gaps?
- What difference are you making?
- Novelty in Familiarity
- Placing in current Context
- Avoiding duplication
- Clarification of controversial results
- State of the art: extend and build on the work of others

How to start research ?

- Collect articles on Reviews / past, present and future survey, on areas of your domain
- Note the scope of work of your interested area
- Search for papers of earlier works on that topic, read those papers, understand the philosophy
- Identify and write down objectives of your research
- Exercise literature survey on the topic chosen
- Pick up very close paper to your objective
- Solve that paper and obtain the same results

Key Concepts in Literature Review

- **Thematic Analysis**
  - Identifying recurring themes in existing research.
- **Citation Analysis**
  - Tracking influential papers and authors in the field.
- **Critical Appraisal**
  - Evaluating the reliability, validity, and relevance of studies.

Sources of Literature

Primary Sources

- Periodicals
- Research Reports
- Conference Proceedings
- Official Publications
- Theses, Dissertations
- To be published work

Secondary Sources:

- Reviews
- Reference Books
- Handbooks
- Encyclopedia
- Textbooks / Monographs
- Indexing and Abstract services

Techniques for Conducting a Literature Review

- **Systematic Search:**
  - Use databases like Scopus, PubMed, or IEEE Xplore.
- **Keywords & Boolean Operators:**
  - Examples: AND, OR, NOT for refining searches.
- **PRISMA Methodology:**
  - Preferred Reporting Items for Systematic Reviews and Meta-Analyses.
- **Concept Mapping:**
  - Organize key ideas and relationships visually.

Journal Articles

- Search the Library Catalogue for related journal titles.
- If you have access, the Catalogue record will direct you to the location of the print journal and/or provide a link to the online journal. Directory of Open Access Journals, NLM Catalog: Journals referenced in the NCBI Database are very helpful for searching the journal's articles.
- The references or bibliography mentioned at the end of useful articles will be helpful to trace further readings on your research topic.
- Request an Institutional subscription from the publisher of the journal article if the Library does not have it.

NLB: National Library of Medicine
NCBI: National Center for Biotechnology Information

Database Searching

- Databases provide access to the information sources and are capable to locate the material on a particular topic, by an author, or in a journal.
- Some databases offers access to high-quality academic and professional matter in a particular subject area e.g. ERIC (educational material); while other databases provide research and general information on many subjects e.g. Proquest.
- Access of database is accessible to personnel with applicable login on the Library home page.
- On the other hand, most of the Library's databases may be search at the same time through a Journal search in Library Search.

ERIC - Education Resources Information Center

The top list of academic research databases

- **Scopus**
  - Provider: Elsevier
- **Web of Science**
  - Provider: Clarivate (formerly Thomson Reuters)
- **PubMed**
  - NIH (National Institute of Health)
- **ERIC (Education Resources Information Center)**
  - U.S. Department of Education
- **IEEE Xplore**
- **ScienceDirect**
  - Elsevier
- **Directory of Open Access Journals (DOAJ)**

- **Peer sharing sources : ResearchGate, academia.edu**

Q1 Journals: The top 25% of journals in a specific academic field, indicating high prestige, influence, and rigorous peer-review standards.
Q2 Journals: The next 25% (between 25-50%).
Q3 Journals: The middle 25% (between 50-75%).
Q4 Journals: The bottom 25% (75-100%).

COLLECTION OF LITERATURE (Hard copy)

- Indian National Scientific Documentation Centre (INSDOC)

- **Location**:

  14, Satsang Marg, Jawaharlal Nehru University, **Delhi ,**

  309 Bipin Behari Ganguly, Street, E-block, 2nd Floor, **Kolkata**,

  Indian Institute of Science Campus , **Bangalore**

How to evaluate a Journal?

Citation Index:

No. of times the article is referred by other indexed journals

Higher the citation index, higher the quality of the article

h-index

i10-index

Impact Factor :

An index for quality of a journal.

- Higher the impact Factor –
  Higher the quality of a journal.
- Given by the **THOMSON REUTERS JCR**

How is Impact factor calculated?

The impact factor (IF) or journal impact factor (JIF) of an academic journal is a scientometric index calculated by Clarivate that reflects the yearly mean number of citations of articles published in the last two years in a given journal, as indexed by Clarivate's Web of Science.

$$\mathrm{IF}_y = \frac{\mathrm{Citations}_y}{\mathrm{Publications}_{y-1} + \mathrm{Publications}_{y-2}}.$$

For example, Nature had an impact factor of 41.577 in 2017:

$$\mathrm{IF}_{2017} = \frac{\mathrm{Citations}_{2017}}{\mathrm{Publications}_{2016} + \mathrm{Publications}_{2015}} = \frac{74090}{880 + 902} = 41.577.$$

This means that, on average, its papers published in 2015 and 2016 received roughly 42 citations each in 2017. 2017 impact factors are reported in 2018; they cannot be calculated until all of the 2017 publications have been processed by the indexing agency.

Some popular ISI (Institute for Scientific Information) impact Factor Journals

- IEEE : Institute of Electrical and Electronics Engineers
- Elsevier
- Springer-Verlog
- ASME : American Society of Mechanical Engineers
- ASCE : American Society of Civil Engineers
- Taylor-Francis
- SAGE

Citation Index Searching

- Citation searching is a exclusive advancement to searching the text related to your topic.
- Reference of any article or an author's name could be used to find published articles at a later date and which is cited the particular article or specific author.
- Use the ISI Web of Science, google scholar database to search the Science/Social Science/Arts and Humanities Citation Indexes online. For older material you can search the printed references in the Central Library. Scopus database also helpful to search these references.

Books

- Start Library Search by using keyword searching for books on your concerned topic.
- Consider the list of references at the end of chapter of useful books will help you to find out additional readings.
- Additional titles may be recovered by using a Library Search.

Theses

- You should search the Library for University theses or dissertations. In website link your keywords on your topic to the keyword thesis and the name of the department/school/discipline/subject.
- From the Databases page, access the National Union Catalogue to search the theses from other universities. Use Research Commons to search for more recent University theses.

- WorldCat Dissertations and Theses database,
- Shodhganga: a reservoir of Indian theses,
- OATD – Open Access Theses and Dissertations,
- Networked Digital Library of Theses and Dissertations (NDLTD)

Scientific Search Engines Used In Literature Survey

iSEEK Education:

iSeek is an tremendous targeted search engine, designed especially for teachers, students, administrators, and caregiver. iSEEK is suitable place where researcher can find reliable, intelligent, and time-saving resources in a safe, editor-reviewed environment.

RefSeek:

RefSeek offers more than 1 billion documents, books, web pages, newspapers, journals, and many more authoritative resources about any subject, without the sponsored links and commercial results.

Virtual LRC:

The Virtual Learning Resources Center is best of academic information websites. It has created a custom Google search. This search is curated by researchers, teachers and library professionals worldwide to share immense resources for academic projects.

Scientific Search Engines Used In Literature Survey

Academic Index:
This search engine and web index was formed for college students. The websites in this index are selected by librarians, teachers, and educational groups. Researcher should be confident to check out their research guides for history, health, nursing studies, criminal justice, and more subjects.

Digital Library of the Commons Repository:
DLC is a place to find worldwide literature including free and open access full-text articles, papers, thesis and dissertations.

Scientific Search Engines Used In Literature Survey

Internet Public Library:

In the Internet Public Library find resources by subject through the Internet Public Library‟s database.

Infomine:

The Infomine is a fantastic tool for searching academic internet resource collections, particularly in the sciences.

Microsoft Academic Search:

Microsoft‟s academic search engine proposed access to more than 38 million different publications, with features including graphing, maps, paths and trends that show how author are connected.

Google Correlate:

Google‟s super cool search tool will allow you to find searches that correlate with real-world data.

Scientific Search Engines Used In Literature Survey

WorldCat:

This software locates the data from 10,000 libraries worldwide including books, CDs, DVDs, and articles. Researchers can find out the nearest library with WorldCat‟s tools.

Google Books:

Through Google books you can search the books all over the world published by different publishers and can see the preview of the content as well as download the free content of the matter.

Scirus:

Scirus is a complete research tool for the scientific information which include more than 460 million scientific items viz. courseware, journal content, educational websites, patents, and many more.

Scientific Search Engines Used In Literature Survey

Google Scholar:

Try Google Scholar to find out scholarly articles on Google. The search focuses on articles, patents, and legal documents. This software also provides the facility of citation counting of research articles to the researcher.

SpringerLink:

It provides the access to millions of scientific documents from journals, e- journals, books, series, protocols and reference works to the researcher.

Directory of Open Access Journals:

Directory of Open Access Journal (DOAJ) is an online directory which indexes and provides access to high quality, open access, full-text quality controlled scientific and scholarly peer-reviewed journals.

Tools to Aid Literature Review

- **Reference Management:**
  - Zotero, EndNote, Mendeley.
- **Databases for Research:**
  - Google Scholar, Web of Science, JSTOR.

What is a Systematic Review?

- **Definition:** A systematic review is a methodical and comprehensive synthesis of research studies focused on a specific research question.
- **Purpose:**
  - To identify, evaluate, and summarize evidence from multiple studies.
  - Minimize bias and ensure reproducibility.

What is a Meta-Analysis?

- **Definition:** A statistical technique for combining results from multiple studies to derive a single quantitative conclusion.
- **Purpose:**
  - To increase statistical power.
  - Provide a more precise estimate of the effect size.

Key Differences Between Systematic Reviews and Meta-Analyses

Aspect	Systematic Review	Meta-Analysis
Focus	Comprehensive synthesis of studies	Statistical combination of data
Method	Qualitative and quantitative	Quantitative only
Outcome	Broad insights and summaries	Effect size and statistical significance

Importance of Systematic Reviews and Meta-Analyses

- **Evidence-Based Practice:** Guides decision-making in healthcare, education, and policy.
- **Identification of Gaps:** Highlights areas requiring further research.
- **Improved Precision:** Provides stronger conclusions than individual studies.

Tools for Systematic Reviews and Meta-Analyses

- **Systematic Review Tools:**
  - Covidence,
  - Rayyan,
  - PRISMA Checklist.

- **Meta-Analysis Tools:**
  - RevMan,
  - Comprehensive Meta-Analysis (CMA),
  - R (meta-package).

What are Literature Management Tools?

- Software designed to:
  - Organize and manage research references.
  - Generate citations and bibliographies automatically.
  - Collaborate and share references with peers.
- Essential for streamlining academic research and maintaining consistency.

Key Features of Literature Management Tools

- **Reference Organization**
  - Create libraries and folders for different projects.
- **Citation Generation**
  - Support for multiple citation styles (APA, MLA, IEEE, etc.).
- **Collaboration**
  - Share libraries with teams or collaborators.
- **Integration**
  - Compatibility with word processors (e.g., MS Word, Google Docs).

Introduction to EndNote

- Developed by **Clarivate**.
- **Key Features:**
  - Advanced search and annotation tools.
  - Over 7,000 citation styles available.
  - Cloud synchronization for access across devices.
- **Best For:** Large-scale research projects and advanced users.

Introduction to Zotero

- Developed by the **Roy Rosenzweig Center for History and New Media**.
- **Key Features:**
  - Simple and user-friendly interface.
  - Browser integration for one-click reference saving.
  - Free and open-source.
- **Best For:** Beginners and individual researchers.

Introduction to Mendeley

- Developed by **Elsevier**.
- **Key Features:**
  - Built-in PDF reader and annotation tools.
  - Social networking features for collaboration.
  - Cross-platform compatibility (desktop, mobile, and web).
- **Best For:** Researchers looking for collaboration and networking

Comparison: EndNote, Zotero, and Mendeley

Feature	EndNote	Zotero	Mendeley
Cost	Paid	Free	Free (with paid plans)
Ease of Use	Moderate	Easy	Easy
Storage	Cloud sync (limited)	Free 300 MB	Free 2 GB
Collaboration	Limited sharing	Free sharing	Strong sharing tools
Integration	MS Word, LaTeX	MS Word, Google Docs	MS Word, Overleaf

All three programs can:

- store references in one place
- export citations directly from databases
- automatically format bibliographies and citations in MLA, APA, Chicago Manual of Style, or thousands of other styles
- keep reading notes linked to sources
- insert citations directly into Word
- attach files to your references and more!

Reasons to Choose

- **EndNote:** Zotero and Mendeley are relatively young tools when compared to EndNote. EndNote X9 offers some advanced features that might be necessary for your discipline and work flow, including hundreds of built-in citation styles.
- **Mendeley:** If your research content is primarily contained in PDF files, Mendeley has an integrated PDF viewer and can create citation records by using the browser extension. Mendeley has the strongest website and community platform.
- **Zotero:** If your research content is diverse, Zotero is the easiest method to gather citation records for non-PDF content. Zotero's single-click capture works with more databases, catalogs, and websites than Mendeley's browser extension. You can also enable the retrieval of PDF metadata, which allows you to create citation records just from dragging a PDF into Zotero. Zotero is open source and cannot be acquired by a company.

Steps in Writing a Literature Review

- **Define the Research Question.**
- **Search for Relevant Literature.**
- **Evaluate and Select Sources.**
- **Organize Information:**
  - Chronologically, thematically, or methodologically.
- **Synthesize Findings and Write.**

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Thank you