



University of Kelaniya

CSCI 32032

Research Methodology and Scientific Communication

LECTURE 2

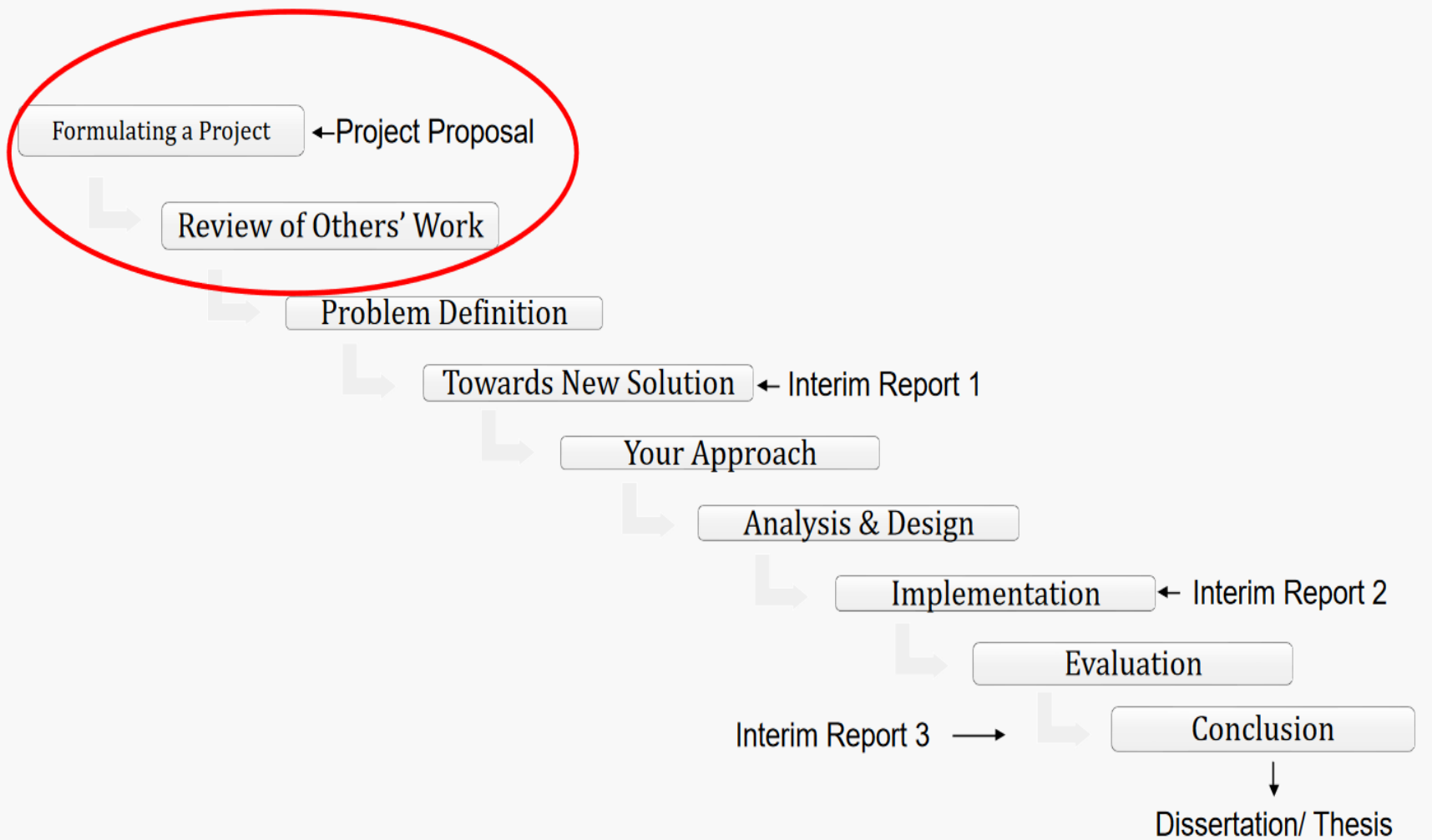
Credit Value : 2

Compulsory

Prerequisite : CSCI 22012

Theory Hours : 28 Practicals : 6 Independent Learning : 66

Research Methodology Milestones –MPhil & PhD



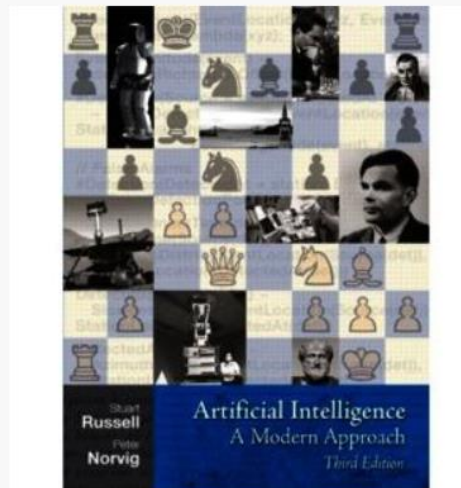
Reading

Why Must a Researcher do reading

- Reading improves communication skills because
 - *It shows how others write*
 - *It provides you with the information for you to write*
 - *It gives motivation to write*
 - *It improves your vocabulary*
 - *It shows some nice usage of languages*
 - *It helps to remember what you studied*
- All good writers were good readers
- Gather knowledge on the field.
- Identify the research gaps or problems.
- Always read good Articles from good sources

Examples of Good Reading Sources

- Journals (periodicals)
 - *Annually published in many times (Issues, volume, No)*
- Conference proceedings
 - *Papers presented at a conference*
- Books
 - *Not as up to date as Journals*
- Online publications
- Open access journals





Mind & Society

Cognitive Studies in Economics and Social Sciences



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Mind & Society is a journal for ideas, explorations, investigations and discussions on the interaction between the human mind and the societal environments. Scholars from all fields of inquiry who entertain and examine various aspects of these interactions are warmly invited to submit their work. The journal welcomes case studies, theoretical analysis and modeling, data analysis and reports (quantitative and qualitative) that can offer insight into existing frameworks or offer views and reason for the promise of new directions for the study of interaction between the mind and the society. The potential contributors are particularly encouraged to carefully consider the impact of their work on societal functions in private and public sectors, and to dedicate part of their discussion to an explicit clarification

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Published: 19 June 2020

Human-mind-inspired processing model for computing

[Chinthanie Weerakoon](#) , [Asoka Karunananda](#) & [Naomal Dias](#)[Mind & Society](#) (2020) | [Cite this article](#)25 Accesses | [Metrics](#)

Abstract

Among various computing models, it is difficult to find a model inspired from the human mind to improve the computational efficiency of the computer. In fact, the human mind becomes competent in responding for the inputs, resourcefully and mindfully acquiring knowledge and experience over continuous processing with the time. Further, as it is possible to find deeper explanation for the human mind in the Buddhism, the introduction of a computing model imitating the human mind based on Buddhist Theory of Mind (BTM) to enhance the

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Terminology in Scientific Publications

- Publishers
- Citation Index
- Impact Factor
- Authors
- Editors
- Reviewers

About this journal

Electronic ISSN Print ISSN

1860-1839

1593-7879

Abstracted and indexed in

CNKI

Dimensions

EBSCO Discovery Service

EBSCO SocINDEX

EBSCO Sociology Source Ultimate

ERIH PLUS

EconLit

Google Scholar

Institute of Scientific and Technical Information of China

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Research Papers in Economics (RePEc)

SCImago

SCOPUS

TD Net Discovery Service

UGC-CARE List (India)

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Journal Impact Factor

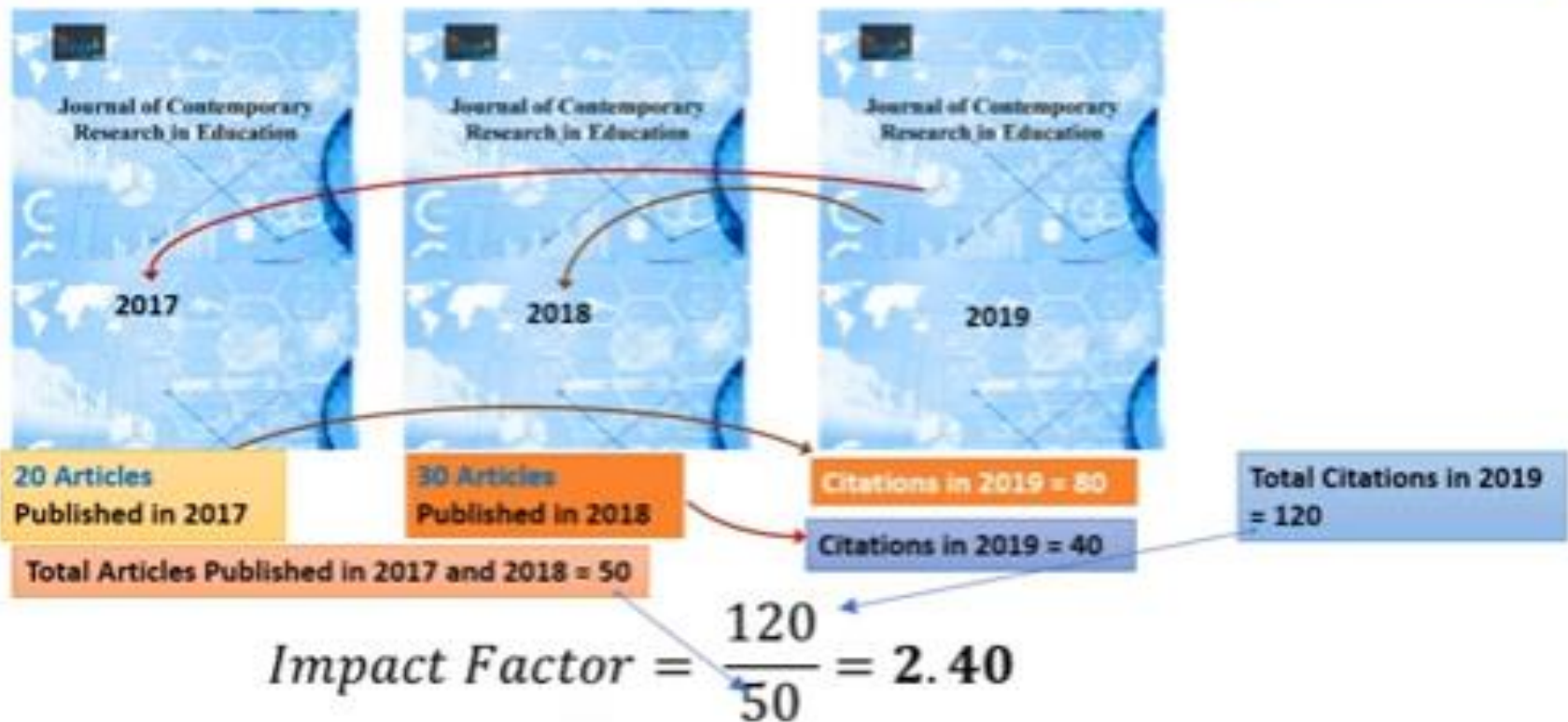
- The impact factor (IF) is frequently used as an indicator of the importance of a journal to its field.
- Based on the yearly average number of citations to articles published in a journal.
- It shows how many times, on average, each article published in a journal is cited over the next two years after its publication

For example, a journal having **impact factor 2** means that journal receives, on average, two citations per article. The Impact factor of a particular journal for 2019 is calculated as:

$$\text{Impact Factor} = \frac{\text{Total Citations in 2019}}{\text{Total Papers Published in 2017 and 2018}}$$



Impact Factor Calculation Example # 1



Limitations of the Impact Factor

- Self-citations
- Many times editors insist that authors cite works in that journal
- Some disciplines tend to cite more than others
- Does not take into account negative citations

Important Points About Journal Impact Factor

1. Overall, reflects influence of journal in the particular research community.
2. **Impact Factor of 5 or higher** is considered good, higher the better.
3. Indicative of the average number of citations any article can expect to receive, once published in the journal.
4. High Impact Factor journals guarantee wider publicity and coverage for published articles.
5. Higher esteem for authors, better communication of new research.

Other Journal Quality Indices



The Researcher should determine the following with clarity :


- *Your area of research*
- *Major researchers in your area*
- *Major research conducted in your area*
- *Major institute doing similar research*
- *Major journals in your area of research*
- *Major conferences in your area of research*


Steps to Improve Reading

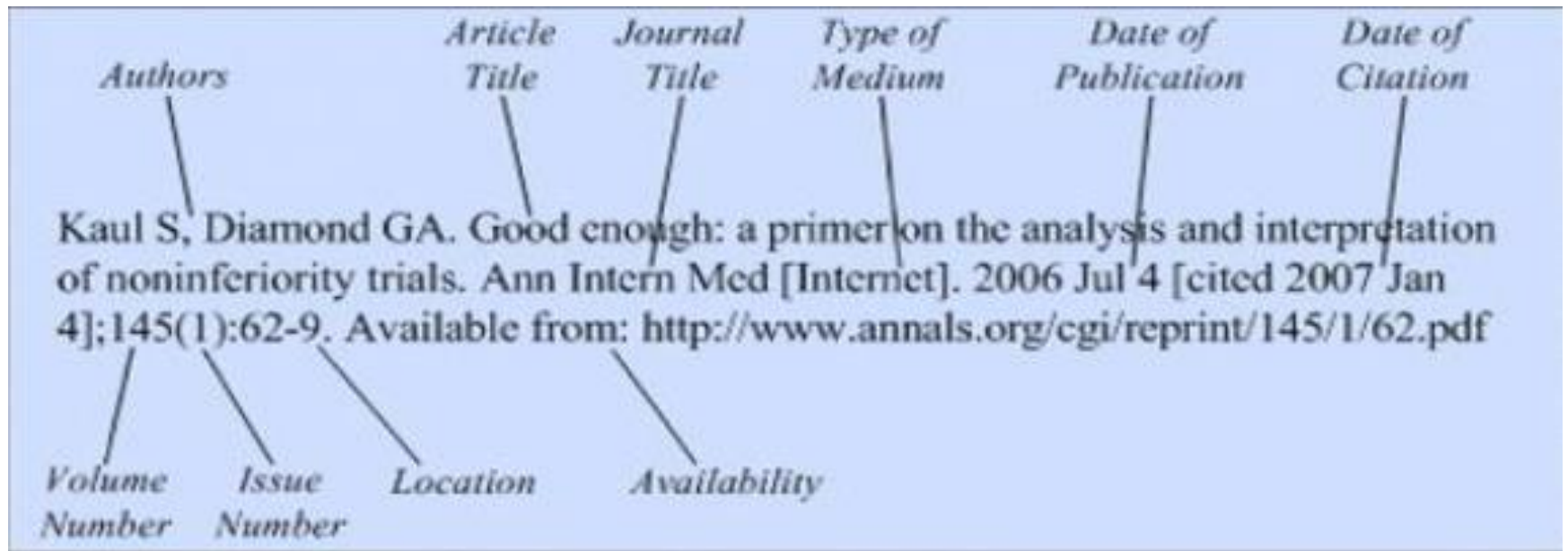
- Practice to scan your eyes from left to right
- Reading little loudly improves understanding
- Read abstract, introduction and summary first
- Use a pen while you read along a line
- Use a strip to guide through the line you read
- Identify key points and mark/underline them
- Read with the intention to grab what you identified
- Use a dictionary to learn new words
- Using own words write a summary of what is read

Writing Citations and References

This is a narrative in-text citation. The author's name is in the text of the sentence. The page number (p. 42) is at the end of the sentence.

 **Stein (2018)** studied whether the early onset of Alzheimer's disease affected individuals younger than 30. His findings revealed that individuals as young as 20 were affected by the disease (p. 42). Another study found similar data, showing that individuals as young as 18 displayed symptoms of the disease (Tang & Pierce, 2014, p. 231). Even though both studies involved individuals in different hemispheres, the results were similar.

 This is a parenthetical citation. In parentheses are the last names of the authors, year published, and page number.



Example of IEEE citations and references

Sadgad gag [1] skdgnio asd ngæi asndgn [2] asdgasd gadgad [3]. Aasdgadg agag [4] argagag ag [1] asdga sgdag [2]. Fasdgasd kndsgin[5] niseng niweg [1, p. 26] ni nins dgins gag [6], asd gas hrtj sdgsdga [7] asdga sdga [8] adga gd gasgag agfa[9].

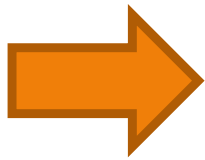
Numbered citations – each source gets its own number

References:

- [1] K. Behfarnia, "Seismic response of buildings with setback," in *Earthquake resistant engineering structures III*, 6th ed., C. A. Brebbia, B. Jones, and S. Ballenger, Eds. Boston, MA: WIT, 2001, pp. 236–288.
- [2] V. Budhreja, "Geothermal energy market in southern California: Past, present & future," *Exec. Speeches*, vol. 7, no. 4, p. 51, Mar. 1993.
- [3] N. G. Fielding and R. M. Lee, *Computer Analysis and Qualitative Research*. New York, NY: SAGE, 1998.
- [4] J. Arrillaga and D. B. Giesner, "Limitation of short-circuit levels by means of HVDC links," presented at the IEEE Summer Power Conference, Los Angeles, CA, 1990.

References are sorted by number

- Once you have a clear problem, it is necessary to check very carefully whether the problem has been solved before.
- In case there has been any attempt, you have to find a better solution.
- Your solution or the approach should be original.



EITHER

- A brand new **Concept** or **Product**
- A **Solution** to a given **Problem**
- A **Better Solution** to an already **Solved Problem**
- **Solution** can even be a **Process** or **Methodology**

THIS IS KEY TO ORIGINAL RESEARCH

What is a Literature Review

- Literature review is an essential preliminary task that go through the existing literature in order to acquaint yourself with the available body of knowledge in your area of interest.
- Provide a support to answer your research question that you may want to find answers to through your research journey.
- Both problem specification and the study of other related approaches to solve problem can be achieved by a literature review.
- At the end of the day you will invent something for your area of research.
- Even while you develop your theory or approach, be aware of ongoing research.

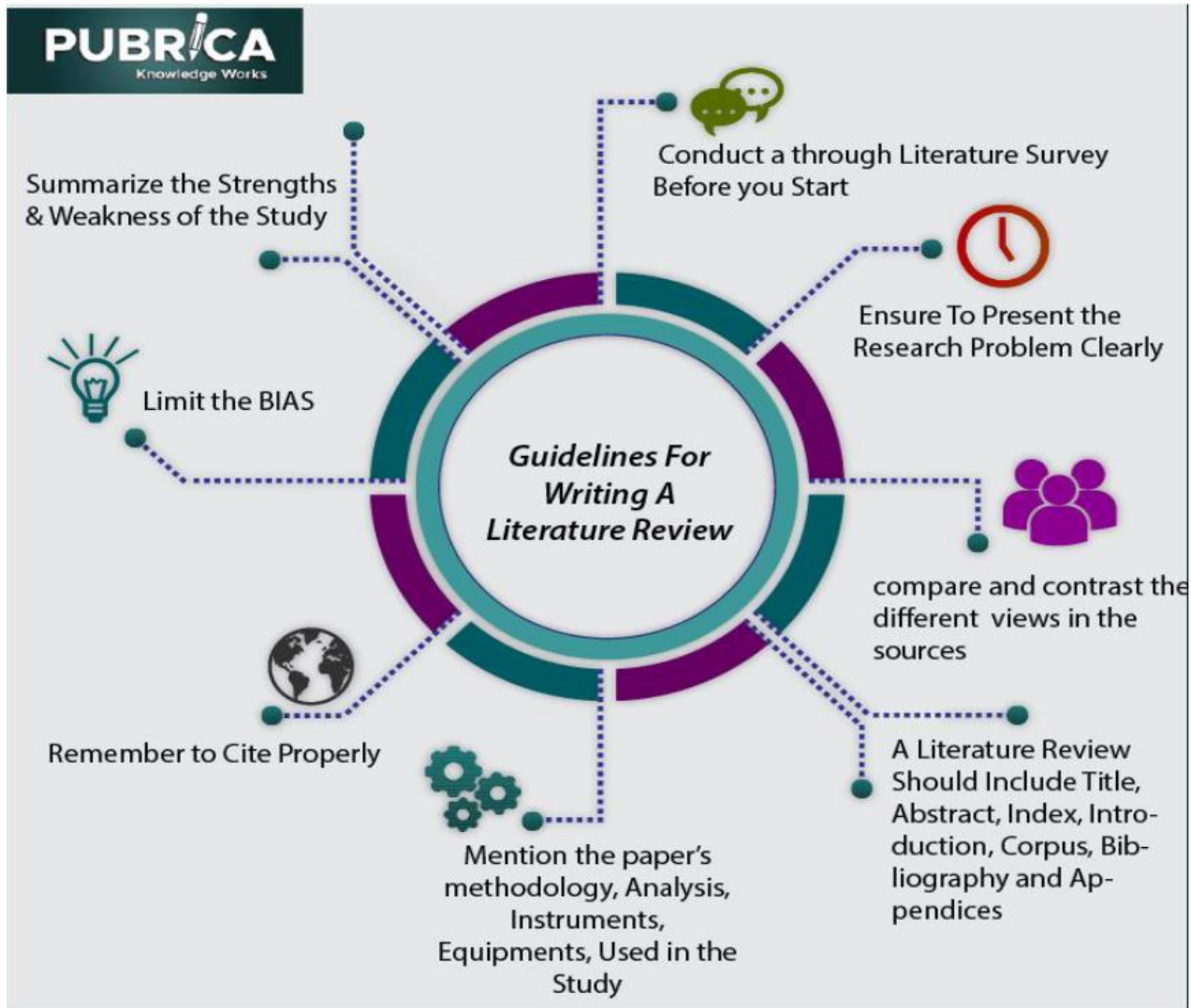
Why is a Literature Review Needed

- bring clarity and focus to your research problem;
 - *Both problem specification and the study of other related approaches to solve problem can be achieved by a literature survey.*
- improve your research methodology;
- broaden your knowledge base in your research area
 - *Aware of the related works in the field.*
 - *Even while you develop your theory or approach, be aware of ongoing research.*
- contextualise your findings.
 - *A justification for the originality of your work.*

How to do a Literature Review

- Searching for the existing literature in your area of study.
 - *Do with regard to the specified problem. Always keep the problem on mind when doing the literature survey.*
 - *Otherwise different literature survey may lead to re-specification of the problem.*
 - *This is how you can converge your research to go deep into the field.*
- Reviewing the selected literature.
 - *To make sure that others have not done similar things, continue with the most up to date literature review.*
- Developing a theoretical framework.
- Developing a conceptual framework.
- At the end of the day you will invent something for your area of research.

Literature Review



Searching for Existing Literature - Sources

- Annual reviews online: This database provides review journals from across the sciences, with articles that review significant primary research literature.
- Cited reference searching
- Web of Science: A collection of citation databases and citation analysis tools covering the sciences, social sciences, arts and humanities.
- Scopus: A multidisciplinary abstract and citation database of peer reviewed literature, book reviews and conference proceedings.
- IEEE Xplore digital library: Provides full-text access to IEEE and IEE transactions, journals, magazines and conference proceedings published since 1988 and current IEEE Standards
- ACM digital library publications: Full text of every article published by the Association for Computing Machinery (ACM) and bibliographic citations from major publishers in computing
- Google Scholar (<http://scholar.google.com>)
- Patents

Reviewing the Selected Literature

- Start reading critically to pull together themes and issues that of relevance to your study.
- Unless you have a theoretical framework of themes in mind to start with, use separate sheets of paper for each theme or issue you identify as you go through selected books and articles.
- Once you develop a rough framework, slot the findings from the material so far reviewed into these themes, using a separate sheet of paper for each theme of the framework so far developed.
- As you read further, go on slotting the information where it logically belongs under the themes so far developed. Keep in mind that you may need to add more themes as you go along.

KEY - Critical Examination of Literature

- Note whether the knowledge relevant to your theoretical framework has been confirmed beyond doubt.
- Note the theories put forward, the criticisms of these and their basis, the methodologies adopted (study design, sample size and its characteristics, measurement procedures, etc.) and the criticisms of them.
- Examine to what extent the findings can be generalised to other situations.
- Notice where there are significant differences of opinion among researchers and give your opinion about the validity of these differences.
- Discover the areas in which little or nothing is known – the gaps that exist in the body of knowledge.

Theoretical Framework

A **theoretical framework** is a foundational review of existing theories that serves as a roadmap for developing the arguments you will use in your own work.

Theories are developed by researchers to explain phenomena, draw connections, and make predictions. In a theoretical framework, you explain the existing theories that support your research, showing that your paper or **dissertation topic** is **relevant** and grounded in established ideas.

In other words, your theoretical framework justifies and contextualizes your later research, and it's a crucial first step for your **research paper**, **thesis**, or **dissertation**. A well-rounded theoretical framework sets you up for success later on in your research and writing process.

Development of a Theoretical Framework

- Examining the literature can be a never-ending task, but as you have limited time it is important to **set parameters** by reviewing the literature in relation to some main themes relevant to your research topic.
- As you start reading the literature, you will soon discover that the problem you wish to investigate has its roots in a number of **theories** that have been developed from different perspectives.
- The information obtained from different books and journals now needs to be **sorted under the main themes and theories**, highlighting agreements and disagreements among the authors and identifying the **unanswered questions or gaps**.
- You will also realise that the literature deals with a number of aspects that have a **direct or indirect bearing on your research topic**. Use these aspects as a basis for developing your theoretical framework.
- Your review of the literature should **sort out the information**, as mentioned earlier, within this framework.
- Unless you review the literature in relation to this framework, you will not be able to develop a focus in your literature search: that is, your theoretical framework provides you with a **guide** as you read.
- This brings us to the **paradox**.
 - Literature pertinent to your study may deal with two types of information:
 - *universal*;
 - *more specific (i.e. local trends or a specific programme)*.

THIS FORMS THE COMPLETE KNOWLEDGE BASE FOR RESEARCH

Development of a Conceptual Framework

- The conceptual framework is the **basis** of your research problem.
- It stems from the theoretical framework and usually **focuses** on the section(s) which become the basis of your study.
- Whereas the theoretical framework consists of the **theories or issues** in which your study is embedded, the conceptual framework **describes the aspects** you selected from the theoretical framework to become the basis of your enquiry. For instance, comparison of two things.
- the conceptual framework is focused on **indicators to measure the success or failure of the strategies**.
- Hence the conceptual framework **grows** out of the theoretical framework and **relates** to the specific research problem.

**THIS HELPS DEFINE THE PROBLEM STATEMENT FOR THE
PLANNED RESEARCH**

Online Reference Management Software Tools

- Are a Plenty

Free Reference Management Tools*



* May have some limitations.

Example : Zotero

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To use Zotero, download and install the Zotero desktop app ...

The screenshot shows the Zotero website's download page. At the top, there's a navigation bar with links for Home, Groups, People, Documentation, Forums, and Get Involved. A search bar is also present. Below the navigation bar, the page is divided into two main sections. The left section is for 'Zotero 5.0 for Windows', featuring a large red 'Z' logo and a 'Download' button. It also mentions 'Your personal research assistant' and lists other platforms: macOS, Linux 32-bit, and Linux 64-bit. The right section is for 'Zotero Connector', featuring a Chrome logo and a red 'Z' logo, with an 'Install Chrome Connector' button. It describes how connectors automatically sense content as you browse. At the bottom, there's a list of recent downloads: 'CI 31032-L Theo...zip', 'CSO 22052-L Intro...zip', 'Mitchell T. (1997)...pdf', and 'Goldberg, D. E. (19...pdf'.

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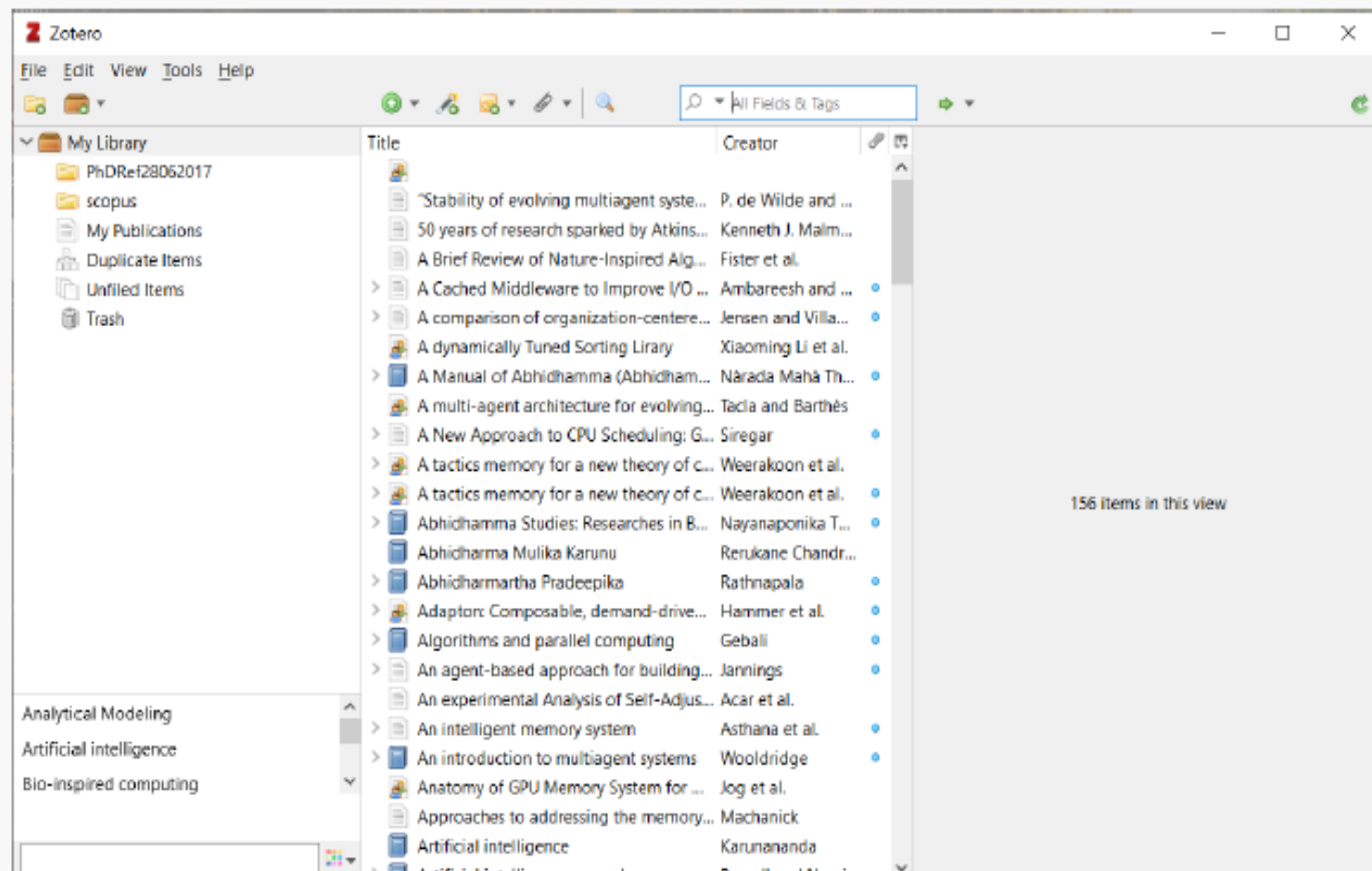
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Zotero Interface



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Writing Article Reviews

- Review articles are written to bring together and summarise the results or conclusions from many original research articles or studies. They do not usually contain a methodology section, but they will contain very extensive bibliographies.
- It focuses on a *specific* topic of interest to you and includes a *critical analysis* of the relationship among different works, and relating this research to your work.
- It may be written as a stand-alone paper or to provide a theoretical framework and rationale for a research study.

Steps to Writing the Review Article

- Step 2: Decide on a topic.
- Step 3: Identify the literature that you will review
- Step 4: Analyse the literature
 - *Overview the articles*
 - *Group the articles into categories*
 - *Take notes*
 - Decide on the format in which you will take notes as you read the articles.
 - Define key terms.
 - Note key statistics that you may want to use in the introduction to your review.
 - Select useful quotes that you may want to include in your review.
 - Note emphases, strengths & weaknesses.
 - Identify major trends or patterns
 - Identify relationships among studies.
 - Keep your review focused on your topic.
 - Evaluate your references for currency and coverage.

- Step 5: Summarize the literature in table or concept map format
 - *Definitions of key terms and concepts.*
 - *Research methods*
 - *Summary of research results*
- Step 6: Synthesize the literature prior to writing your review
 - *Consider your purpose and voice before beginning to write.*
 - *Consider how you reassemble your notes*
 - *Create a topic outline that traces your argument*
 - *Within each topic heading, note differences among studies.*
 - *Within each topic heading, look for obvious gaps or areas needing more research.*
 - *Plan to describe relevant theories.*
 - *Plan to discuss how individual studies relate to and advance theory*
 - *Plan to summarize periodically and, again near the end of the review*
 - *Plan to present conclusions and implications*
 - *Plan to suggest specific directions for future research near the end of the review*
 - *Flesh out your outline with details from your analysis*

■ Step 7: Writing the review

- *Identify the broad problem area, but avoid global statements*
- *Early in the review, indicate why the topic being reviewed is important*
- *Distinguish between research finding and other sources of information*
- *Indicate why certain studies are important*
- *If you are commenting on the timeliness of a topic, be specific in describing the time frame*
- *If citing a classic or landmark study, identify it as such*
- *If a landmark study was replicated, mention that and indicate the results of the replication*
- *Discuss other literature reviews on your topic*
- *Refer the reader to other reviews on issues that you will not be discussing in details*
- *Justify comments such as, "no studies were found."*
- *Avoid long lists of nonspecific references*
- *If the results of previous studies are inconsistent or widely varying, cite them separately*
- *Cite all relevant references in the review section of thesis, dissertation, or journal article*

■ Step 8: Developing a coherent essay

- *Abstract: provide an overview near the beginning of the review*
- *Near the beginning of a review, state explicitly what will and will not be covered*
- *Specify your point of view early in the review: this serves as the thesis statement of the review.*
- *Aim for a clear and cohesive essay that integrates the key details of the literature and communicates your point of view (a literature is not a series of annotated articles).*
- *Use subheadings, especially in long reviews*
- *Use transitions to help trace your argument*
- *If your topic teaches across disciplines, consider reviewing studies from each discipline separately*
- *Write a conclusion for the end of the review: Provide closure so that the path of the argument ends with a conclusion of some kind. How you end the review, however, will depend on your reason for writing it. If the review was written to stand alone, as is the case of a term paper or a review article for publication, the conclusion needs to make clear how the material in the body of the review has supported the assertion or proposition presented in the introduction. On the other hand, a review in a thesis, dissertation, or journal article presenting original research usually leads to the research questions that will be addressed.*
- *Check the flow of your argument for coherence.*

End of Lecture 2