

HRT101.S1

Introduction to Health Research: Scientific Paper Reading and Research Data Management

Md. Jubayer Hossain
Founder, CHIRAL Bangladesh
15 January 2022



Agenda

- Anatomy of a Scientific Paper
- How to Read a Scientific Paper Quickly?
- Academic Phrasebank
- Identifying Location
- Research Data Management
- Documentation: Literature Review Matrix
- Using Literature Review Matrix Template

Anatomy of a Scientific Paper

Anatomy of a Scientific Paper

- Title
- Abstract
- Introduction / Background
- Methods
- Results
- Discussion
- Conclusion

Anatomy of a Scientific Paper: Title

- Purpose - The initial aim of a title is to capture the reader's attention and to draw his or her attention to the research problem being investigated.
- Length - Concise
- Elements:
 - The purpose of the research
 - The narrative tone of the paper (typically defined by the type of the research)
 - The methods used

Anatomy of a Scientific Paper: Abstract

- Purpose - Mini version of the paper
- Length - 200-250 words
- Tense - Simple Past Tense
- Elements:
 - Objectives
 - Methods
 - Results
 - Conclusions

Anatomy of a Scientific Paper: Introduction

- Purpose - Provides rational of the study
- Keywords & Academic Phrases: - previous studies, performed a study, several studies have been investigated, only few studies, recent studies
- Length - 500-1000 words
- Tense - Simple Past Tense
- Elements:
 - Nature and scope of the problem
 - Review of relevant literature
 - Hypothesis
 - Approach(Justification for this approach)
 - Principal results
 - Objectives/Main conclusions

Anatomy of a Scientific Paper: Methods

- Purpose - Describe what was done? experiment, model or field study
- Keywords & Academic Phrases: conducted, designed, consider, experiment, performed
- Length - 500-1000 words
- Tense - Simple Past Tense - refers to work done
- Elements:
 - Description of instruments
 - Description of procedure in logical order
 - Significant details so that procedure can be reproduced
 - Sampling
 - Data collection
 - Measurement
 - Data Analysis

Anatomy of a Scientific Paper: Results

- Purpose - Presents the data, the facts what researchers found.
- Keywords & Academic Phrases - investigated, observed, discovered, revealed
- Length - 500-1500 words
- Tense - Simple Past Tense - refers to what was found, observed or investigated
- Elements:
 - Results
 - Data interpretation
 - Observations during experiment or fieldwork
 - Observations about the results(e.g, compare/contrast between experiments)
 - Sampling
 - Results of calculation using data, such as rates, ratio or errors

Anatomy of a Scientific Paper: Discussion

- Purpose - Shows the relationship among the facts, puts results in context of previous research
- Keywords & Academic Phrases - This study has identified..., These findings are..., However, these results were..., The test was successful as it was..., The results of this study
- Length - 1000-1500 words
- Tense - Simple Present Tense - emphasis on established knowledge and present knowledge
- Elements:
 - Trends, relationships, generalizations shown by the results
 - Any exceptions, outlying data(and why)
 - How researcher's result agree or disagree with previous studies, and why?

Anatomy of a Scientific Paper: Conclusion

- Purpose - Summarize principal findings
- Keywords & Academic Phrases - In conclusion, In addition, Overall, Nevertheless
- Tense - Simple Present Tense - emphasis on what should now be accepted as established knowledge.
- Elements:
 - Conclusion should relate back to the introduction, the hypothesis
 - Summary of evidence supporting each conclusion
 - Implications, the significance of results or any practical applications

Academic Phrasebank

What is Academic Phrasebank?

Academic phrasebank refers to a library containing a collection of English phrases that can be readily used in scientific papers and academic reports.

Source: REF-N-WRITE; Accessed January 11, 2022, at <https://www.ref-n-write.com/trial/academic-phrasebank/>

Using Academic Phrasebank?

- Academic Phrasebank - <https://www.phrasebank.manchester.ac.uk/>
- REF-N-WRITE - <https://www.ref-n-write.com/trial/academic-phrasebank/>

How to Read a Scientific Paper Quickly?

Three Pass Approach

Each pass accomplishes specific goals and builds upon the previous pass:

- The first pass gives you a general idea about the paper.
- The second pass lets you grasp the paper's content, but not its details
- The third pass helps you understand the paper in depth.

Adapted from Keshav, Srinivasan. "How to read a paper." ACM SIGCOMM Computer Communication Review 37.3 (2007): 83-84.

Three Pass Approach: The First Pass

- The first pass is a quick scan to get a bird's-eye view of the paper.
- You can also decide whether you need to do any more passes.
- This pass should take about five to ten minutes and consists of the following steps:
 - Carefully read the title, abstract, and introduction
 - Read the section and sub-section headings, but ignore everything else
 - Read the conclusions
 - Glance over the references, mentally ticking off the ones you've already read

Adapted from Keshav, Srinivasan. "How to read a paper." ACM SIGCOMM Computer Communication Review 37.3 (2007): 83-84.

Three Pass Approach: At The End of First Pass

You should be able to answer the five Cs:

1. Category: What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?
2. Context: Which other papers is it related to? Which theoretical bases were used to analyze the problem?
3. Correctness: Do the assumptions appear to be valid?
4. Contributions: What are the paper's main contributions?
5. Clarity: Is the paper well written?

Adapted from Keshav, Srinivasan. "How to read a paper." ACM SIGCOMM Computer Communication Review 37.3 (2007): 83-84.

Three Pass Approach: The Second Pass

- In the second pass, read the paper with greater care, but ignore details such as proofs.
- It helps to jot down the key points, or to make comments in the margins, as you read.
- Look carefully at the figures, diagrams and other illustrations in the paper.
- Pay special attention to graphs.
- Are the axes properly labeled?
- Are results shown with error bars, so that conclusions are - statistically significant?
- Common mistakes like these will separate rushed, shoddy work from the truly excellent.
- Remember to mark relevant unread references for further reading (this is a good way to learn more about the background of the paper).

Adapted from Keshav, Srinivasan. "How to read a paper." ACM SIGCOMM Computer Communication Review 37.3 (2007): 83-84.

Three Pass Approach: The Third Pass

- To fully understand a paper, particularly if you are re- viewer, requires a third pass.
- This pass requires great attention to detail.
- This pass can take about four or five hours for beginners, and about an hour for an experienced reader.

Adapted from Keshav, Srinivasan. "How to read a paper." ACM SIGCOMM Computer Communication Review 37.3 (2007): 83-84.

Scientific Paper: Identifying Location

Identifying Location: 4 Phages

- Phage 1: To know the summary of a paper
 - Read the abstract first(objectives, methods, results, conclusions)
- Phage 2: If interested in what this paper is all about
 - Read last paragraph of introduction(research questions, research hypothesis & objectives)
- Phage 3: If interested in summary findings
 - Read first paragraph of discussion and conclusion
- Phage 4: If interested in strengths and limitations of the study
 - Read the last paragraph of discussion

Research Data Management(RDM)

What is Research Data Management(RDM)?

- Research data management (RDM) refers to the organisation, storage and preservation of data created during a research project
- It covers initial planning, day-to-day processes and long-term archiving and sharing.

Source: The University of Scheffield; Accessed January 14, 2022, at <https://www.sheffield.ac.uk/library/>

Why Research Data Management(RDM)

To ensure that research data are:

- Secure
- Sustainable
- Reusable

What is Research Data?

Research Data

Any information collected or generated for the purpose of analysis, in order to generate or validate scientific claims.

Types of Research Data?

Research data can be classified in different ways:

- Content - Numerical, textual, audiovisual, multimedia, etc.
- Format - Spreadsheets, databases, images, maps, audios, files, and unstructured text.
- Methods - Experimental, observational, simulation, derived.
- Nature - Digital(born-digital or digitized) or non-digital(paper surveys)
- Source - Primary, secondary
- Processing - Raw, processed

Steps in Research Data Management(RDM)

- Planning
- Collecting
- Organizing
- Documenting
- Storing
- Backing-up
- Preserving
- Sharing

Research Data Lifecycle

- Before Research - Planning
- During Research - Collecting, Organizing, Documenting, Storing, Backing-up
- After Research - Sharing, Preserving

Benefits of Managing and Sharing Data

- Minimizing your risk of losing valuable data
- Increasing your research efficiency
- Facilitating collaborative research
- Supporting research quality and integrity
- Enhancing the visibility and impact of your research
- Complying with(external) data requirements
- Accelerating scientific discovery
- Increasing return on investment

Managing and Organizing Information

- Folder Structure
- Sample Project
 - Word Documents
 - Research Articles
 - Questionnaires
 - Datasheets
- Files Inside the Folder
 - Research Articles - `name_of_author_year_keywords.pdf`
 - Word Documents(version1) - `name_of_file_year_v1.docs`
 - Word Documents(version2) - `name_of_file_year_v2.docs`

Documentation: Literature Review Matrix

Documentation Approach

- Author
- Year Title of Paper
- Keywords
- Journal
- Country
- Aims
- Methodology
- Document Type
- Publication Setting
- Knowledge Type
- Data Source
- Sample Size
- Main Findings
- Limitations
- Future Research Remarks(if any)
- URL

Using Literature Review Matrix Template

Thanks!

Find me:

Email: contact.jubayerhossain@gmail.com

Website: <https://jhossain.com/>

Github: <https://github.com/hossainlab>