How to Write A Scientific Paper: common challenges and strategies for improvement

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Welcome!

“If you want to change the world, pick up your pen and write”

– Martin Luther King

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Common challenges in producing a good scientific paper

1. Still researching, not yet ready for writing?
2. Too broad objective
3. Unclear argument
4. No word budget planning
5. Limited knowledge of the requirement of the targeted publishing media
6. No review before submission
7. Poor transition between sections
8. Introduction and conclusion not linked together
9. Inconsistency - changes in tones in different sections
10. Limited confidence in making new claims to knowledge

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Common Problems

**Writing Frame:** “I have a lot of practical experience, data and information. But I do not have useful frameworks to organize them.”

**Epistemological Value of Everyday Actions:** “My *videsi* friend wrote 42 pages out of the 4 day trip. I had hardly 4 pages from the same.”

**Incentives:** “My boss and entire organization value what I have done, but not what I have written.”

**Attitude and Cultural Dispositions:** “I find it boring to write.”

**Skills:** “I have made several attempts but did not really get through.”

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Why Write?

- Articulate
- Promote ideas/thoughts
- Invite critiques
- Persuade
- Reflect and learn
- Document
- Clarify thought
- Facilitate decisions
- Examine issues/cases/events
- Communicate
- Influence debates
- Facilitate decisions

Impacts:
- Policy
- Theory
- Action
Challenge 1: How to plan a scientific paper?
Audience Types

Philosophical Academic
- High abstraction
- Generality of knowledge
- Cases are instrumental

Pragmatic Academic
- Dialogue between theory and case

Technical professionals
- Focus on disciplinary jargons

Action Researchers
- Knowledge linked to action
- Learning through experience

Mangers and policy makers
- Readers of key points and conclusions
- Look for concrete recommendations

Frontline workers
- Look for how to?
- Trouble shooting guides

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Varieties of scientific writing

- Journal articles
- Review essay or research articles to Journal
- Research monographs
- Feasibility reports
- Think tank discussion papers
- Short articles and papers to Journals
- Media OP-ED
- Policy briefs
- Book chapters
- Books
- Edited books
Writing a Scientific Paper: Five Milestones

1. Cut off point
   - Experience
   - Ontological assumptions

2. Links to the wider body of knowledge
   - Gaps, controversies
   - Scope, objectives and questions

3. Epistemology
   - How you prove your knowledge addition
   - Data, evidence, structure of argument

4. Outlet
   - Journal, audience, language
   - Readers
   - Reviewers
   - Feedback

5. Paper

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Challenge 2: How to structure the paper?
Structuring a Scientific Article

Macro Structure
- Sections, sub-sections and connections
- Key arguments
- Adequacy of evidence

Meso Structure
- Topic sentences and paragraphs
- Connections and flow between paragraphs
- Allocation of evidence and cases

Micro Structure
- Sentence structure
- Linkages between sentences
- Grammar
- References

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Macro Structure

• Recognize your **purpose** and remember your **audience**

• List down the ‘**specific arguments and supportive ideas**’ that you want to bring

• **Delimit the coverage** of the paper - select only appropriate details

• **Capture, conceptualize and report the factual results** of an investigation

• **Bring examples, explain causes, offer reasons** – to persuade your reader that the opinion expressed in the thesis is a sensible one.

• **Consider the technicalities of the writing** - format, outline, and structure

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Meso Structure

• **Topic sentences (of paragraph)**
  – supports the thesis by clearly stating a main point in the discussion, announces what the paragraph will be about and controls the subject matter (examples, details and explanation) of the paragraph.
  – Focused and precisely stated *Topic sentence* will help reader to understand the point of the paragraph and also help you select, organize and develop your supporting details.
  – generally put as the first/second or last sentence of the paragraph.

• **Paragraphs**
  – Each paragraph presents and develops one main point in the discussion.
  – Use specific details with adequate clarity on message
  – Consider the focus and precision of the content

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Meso Structure

• **Connections and flow between paragraphs**
  - Choose a *logical arrangement* that makes specific information easy to locate to support argument - use a layout that is most common.
  - Consider flow of ideas and logical connection - avoid an erratic organization of details
  - Maintain analytical consistency - avoid any sudden changes in perspective
  - Coherent sequencing of paragraphs is also equally important.

• **Allocate evidence to each of the sections and arguments**
Micro Structure

• Explain, exemplify, define or support your topic sentence.

• List down the specific information, data and evidences that support your [specific] arguments – these evidences may come from different sources such as your practice, original work, secondary literatures/reports etc.

• Give the sources of evidence by

  - citing (process of indicating where an idea or information comes from),

  - quoting (the use of exact words from another source),

  - paraphrasing (expressing the original ideas in different words).

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Challenge 3: How to choose the style of the paper?
# Different styles of scientific writing

<table>
<thead>
<tr>
<th>Style 1</th>
<th>Style 2</th>
<th>Style 3</th>
<th>Style 4</th>
<th>Style 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Introduction</td>
</tr>
<tr>
<td>Methodology</td>
<td>Theory</td>
<td>Findings</td>
<td>Context</td>
<td>Aspect A</td>
</tr>
<tr>
<td>Findings</td>
<td>Methodology</td>
<td>Discussion</td>
<td>Concept and methods</td>
<td>Aspect B</td>
</tr>
<tr>
<td>Discussion</td>
<td>Findings</td>
<td>Conclusion</td>
<td>Findings</td>
<td>Aspect C</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Discussion</td>
<td>Discussion</td>
<td>Discussion</td>
<td>Aspect D</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td></td>
<td></td>
<td>Conclusion</td>
</tr>
</tbody>
</table>
Challenge 4: How to craft a good thesis statement and argument?
Thesis Statement – What?

• It declares the **controlling idea** of the paper

In this paper, we demonstrate that community institutions are more effective than private groups in energy service delivery.

(Weak: this paper analyses service delivery..)

The aim of this paper is to present the findings of research which shows that bamboo can withstand earthquake up to 7 Richter scale

(Weak: this paper presents...../analyzes....)
Writing A Good Thesis Statement

• States the writer’s clearly defined opinion on the subject.

• Asserts one good idea.

• Has something worthwhile to say.

• Clearly fit with the goal of the paper

• Clearly stated in specific terms.

• Easily recognized as the main idea and often located in the first or second paragraph of the Introduction.

• Allows you to find out your real focus and/or expand the scope of the paper.

• Helps you to organize your paper.
Argument

• I/we argue that.....

• It is argued that.....

• This paper challenges the view that....

• This paper refutes the view that....

• This paper questions the theory that....

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Challenge 5: How to write a good Introduction section?
Introduction: key questions you must address for the readers

• What is the paper about?
• Why is this paper important to read?
• What is your thesis? Argument?
• Is the paper really based on credible and valid method?
• How does the paper unfold in the rest of the sections?
Key challenges in writing the Introduction

• 1st sentence?
• Writing to impress and retain the reader
• Keeping flow
• Focusing on ‘introducing’ and not on ‘describing’, ‘analyzing’ or ‘concluding’
• Dealing with overlaps with other sections – context, theory, method, conclusion
## ‘Introduction’ of a Paper

<table>
<thead>
<tr>
<th>Elements</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Opening</td>
<td>- Interesting quote, fact, figure</td>
</tr>
<tr>
<td></td>
<td>- A controversial statement</td>
</tr>
<tr>
<td></td>
<td>- A theoretical debate statement</td>
</tr>
<tr>
<td></td>
<td>- An empirical problem</td>
</tr>
<tr>
<td>2. Problematising</td>
<td>- Referring to wider literature</td>
</tr>
<tr>
<td></td>
<td>- Explaining the scale, diversity and severity of the problem</td>
</tr>
<tr>
<td>3. Clarifying your argument and thesis</td>
<td>- Contrasting with existing theory</td>
</tr>
<tr>
<td></td>
<td>- Filling the gaps in knowledge and evidence</td>
</tr>
<tr>
<td></td>
<td>- New evidence or case to existing theory</td>
</tr>
<tr>
<td>4. Outlining aims and objectives</td>
<td>- 2 to 3 specific objectives - coherently framed under a single aim</td>
</tr>
<tr>
<td>5. Clarifying the flow of the paper</td>
<td>- Explain how different sections are organized and how the argument flows</td>
</tr>
</tbody>
</table>

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Challenge 6: How to write a good conclusion section?
Writing ‘Conclusion’

• So what?
• 1\textsuperscript{st} sentence?
• Make a clear claim of new knowledge
• Do not bring new idea
• Do not reproduce evidence / do not repeat the body text
• Give your opinion on the fact/analysis
• Include a call for action (policy, practice)
• Link back to introduction

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Challenge 7: How to ensure a good transition and flow inside the section?

Transition Sets
Adapted from Step Up to Writing Tool 4-36A Copyright 2006
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- Introduce new ideas.
- Connect key/star ideas (reasons, details, or facts).

Basic Transition Sets
One • The other
One • Another
First of all • Also
To begin • Next
One • Equally Important
First of all • Next • The final
One example • Another example
A good example • A better example
An important • An equally important
A good • A better • The best
To begin • Then • After that
One way • Another way • A final method
Initially • Then • After that
A bad • A worse • The worst
To begin • At the same time • Finally
First of all • Besides • In addition

Transition Words for Showing Place or Location
Near • Outside
Beside • Inside
On top of • Behind
Between • Next to
Across from • By
Throughout
To the right of
On the left side

Transition Words for Showing Time
Before • After
During • Later
Until • Then
Meanwhile
As soon as
Sometimes

Transitions Words for Showing Alike or Different
Similar to • Unlike
Equal to • On the other hand
A similar • Just the opposite
Another • Different from
The same as • But

Transitions Words for Making a Point
For example • An example of
For instance • As well as
In other words
The most important
Furthermore

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# Transition Words

<table>
<thead>
<tr>
<th>Green</th>
<th>Yellow</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>One reason</td>
<td>Second</td>
<td>Last</td>
</tr>
<tr>
<td>First</td>
<td>Third</td>
<td>Finally</td>
</tr>
<tr>
<td>For example</td>
<td>Another reason</td>
<td>In conclusion</td>
</tr>
<tr>
<td>One example</td>
<td>Another example</td>
<td>In summary</td>
</tr>
<tr>
<td>To begin with</td>
<td>Also</td>
<td>In short</td>
</tr>
<tr>
<td>To start with</td>
<td>As well as</td>
<td>So you can see</td>
</tr>
<tr>
<td></td>
<td>Too</td>
<td>As one can see</td>
</tr>
<tr>
<td></td>
<td>In Addition</td>
<td>To summarize</td>
</tr>
<tr>
<td></td>
<td>Additionally</td>
<td>Hence</td>
</tr>
</tbody>
</table>
Challenge 8: How to accurately cite a literature?

What is the purpose of a literature review:
- Find out what information already exists in your field of research
- Identify gaps in literature
- Find other people working in your field
- Identify major seminal works
- Identify main methodologies and research techniques
- Identify main ideas, conclusions and theories and establish similarities and differences
- Provide a context for your own research
- Show relationships between previous studies or theories


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Challenge 9: How to write abstract?

1. Reason for writing:
What is the importance of the research? Why would a reader be interested in the larger work?

2. Problem:
What problem does this work attempt to solve? What is the scope of the project? What is the main argument, thesis or claim?

3. Methodology:
An abstract of a scientific work may include specific models or approaches used in the larger study. Other abstracts may describe the types of evidence used in the research.

4. Results:
An abstract of a scientific work may include specific data that indicates the results of the project. Other abstracts may discuss the findings in a more general way.

5. Implications:
How does this work add to the body of knowledge on the topic? Are there any practical or theoretical applications from your findings or implications for future research?

Source: University of Melbourne
Thank you.