Checklist for research papers

compiled by

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Introduction

Most researchers know the basics of writing a good paper but time constraints often lead to key aspects being forgotten. This checklist will help you put together a well-structured paper and avoid some basic mistakes in English. Remember most papers get rejected due to a poor structure or because the purpose and added value of the research are not clear.

What is my paper's added value?

How will your field and science in general benefit from the research you intend to publish? If this added value is not clear then is your paper worth publishing (see Appendix 1 to this checklist)?

Have I chosen the right journal?

Which journal is most appropriate for your research? Which audience do you want to reach and why? Remember that a high journal impact factor is not everything! Be aware that an editor spends just one or two minutes reading a paper before accepting or rejecting it. So ensure that your paper's title, abstract and introduction grab the editor's attention.

Does my paper have a clear structure?

A brief and easy-to-understand description of what a paper should contain is given at: http://www.columbia.edu/cu/biology/ug/research/paper.html

Consider drafting your paper in the following order:

1. Results – what have I got?
2. Method – what must someone do to reproduce my results?
3. Conclusion – what have I learned?
4. Introduction – what did I know and why did I do this research?
5. Discussion- why are my results important and what needs to be done next?
6. Abstract – summary of the most essential information in your paper
7. Title – pitch your paper in a few words

A few tips:

- A scientific paper is a story. Get a non-specialist to read your paper. They should be able to understand what you did and why.

- The purpose of your research should be clear from your paper's title. Words in the title should be used in the abstract and in the keywords for your paper.

- The abstract is your sales pitch. It should contain the essential information from your paper.

- Read just the first sentence from each paragraph in your paper. This information alone should clearly state the story of your research, i.e. each paragraph should be about a main topic.

Have I followed the instructions for authors?

Be careful! Each journal has its own instructions for authors and these vary considerably. Some are very brief and make few requirements, whereas others almost tell you how to write a scientific paper. Double check you have done everything the journal requires!

A few tips:

- Take advice on word counts seriously (longer papers cost more to publish!).
- Structure your paper as the journal requires.
- Read the journal's instructions for reviewers. Then you will know what you should pay particular attention to in your paper.
- Avoid using abbreviations in the title (most journals discourage this) and keep the use of abbreviations in the paper to a minimum.
- If you use abbreviations then define these when they occur for the first time in the abstract and main text and then use them consistently throughout the text (with the possible exception of headings).
- Most journals prefer abbreviations used in the figures and tables to be defined in the legends too.
- Pay particular attention to your list of references. Serious mistakes are often made here (e.g. authors' names misspelled, wrong volume or page numbers).
- Ensure all the listed references have been cited in the text and that this is done in the required style.
- Pay particular attention to the requirements for figures and tables.
- Check that all the figures and tables have been cited in the text and are numbered consecutively according to the order they are cited in.

Is my English clear enough?

- Put important new information at the end of a sentence as that is where it has the greatest impact in English.
- Aim for an average sentence length of 15–20 words but vary the length of your sentences.
- Be careful with punctuation. Poor punctuation can make good science unclear or hard to understand: see the paper in Radiology entitled 'Grammar and Punctuation in Scientific Writing' (http://radiology.rsna.org/content/218/1/8.full).
- Keep it simple! Avoid jargon and abbreviations where possible. Write in clear and straightforward English but do not be informal (e.g. do not use contractions like don't).

- Remember English uses the decimal point and not the comma. So p = 0.05 and not p = 0,05.

- Edit! Chop out as many words as possible from your paper without losing essential information or meaning (see Appendix 2 at the end of this checklist).

Have I been consistent?

Ensure consistency throughout your paper with regard to:

- style of headings (e.g. first-order headings all in boldface)
- UK or US spelling (e.g. behaviour or behavior, but not both!)
- spaces around symbols (e.g. n=10 or n = 10).

Is my finished paper presented well enough?

Use these questions to check the presentation of your paper:

- Title: Is it adequate and appropriate for the content of the paper?
- Abstract: Does it contain the essential information of the paper? Is it complete? Is it suitable for inclusion by itself in an abstracting service?
- Diagrams, figures, tables and captions: Are they essential and clear?
- Text and mathematics: Are they brief but still clear?
- Conclusion: Does the paper contain a carefully written conclusion, summarising what has been learned and why it is interesting and useful?

(taken from: http://atom.iop.org/atom/help.nsf/0/B44DBD2EA2EF742D80256EC5004671D7?OpenDocument)

Have I done two last checks?

- Do not forget to check the spelling but remember a spell-checker does not see everything (e.g. correct use of two, to or too)!
- Read your paper 'backwards', starting at the last page and reading paragraph for paragraph back to the title. Then you are more likely to pick up mistakes.

Appendix 1 Is my research worth publishing?

The Institute of Physic's guidelines for reviewers provides the following criteria assessing whether a paper merits publication. Does your proposed paper satisfy these?

Technical

- Scientific merit: Is the work scientifically rigorous, accurate and correct?
- Appropriateness: Is the material appropriate for the journal?
- Clarity: Are ideas expressed clearly and concisely? Are the concepts understandable? Is the discussion written in a way that is easy to read and understand?
- Referencing: Has the author made reference to the most recent and most appropriate work? Is the present work set in the context of the previous work?
- Balance: Do you think the overall balance and structure of the paper is good? Should the authors concentrate more on a specific area of the paper, or are there sections which are unnecessary and which could be reduced or eliminated?

Quality

- Originality: Is the work relevant and novel? Does the work contain significant additional material to that already published? If you feel that the work presented is unoriginal, it is useful if you can supply references for transmission to the authors. Is this paper likely to be cited in future?
- Motivation: Does the problem considered have a sound motivation? All papers should clearly demonstrate the scientific interest of the results. Papers should not rely solely on previous literature or novelty to motivate publication.
- Repetition: Have significant parts of the manuscript already been published? Serial publications are not encouraged and follow-up papers must contain significant additional new material to that already reported.
- Length: Is the content of the work of sufficient scientific interest to justify its length? Each paper should be of the shortest length required to contain all useful and relevant information, and no longer. If you recommend shortening, it is useful to the author(s) if you can indicate specific areas where you think that reduction is required.

(taken from: http://atom.iop.org/atom/help.nsf/0/B44DBD2EA2EF742D80256EC5004671D7?OpenDocument)

Appendix 2 Tips for using fewer words

Omit phrases such as:

As already stated
It has been found that
It has long been known that
It is interesting to note that
It is worth mentioning at this point
It may be said that
It was demonstrated that

Omit excess words.

Instead of	***Use***
It is a procedure that is often used.	This procedure is often used.
There are seven steps that must be completed.	Seven steps must be completed.
This is a problem that is...	This problem is...
These results are preliminary in nature.	These results are preliminary.

Use single words instead of phrases.

Instead of	***Use***
a number of	many, several
a small number of	a few
are in agreement	agree
are found to be	are
are known to be	are
at present	now
at the present time	now
based on the fact that	because
by means of	by
despite the fact that	although
due to the fact that	because
during that time	while
fewer in number	fewer
for the reason that	because
has been shown to be	is
if it is assumed that	if
in consequence of this fact	therefore, consequently
in length	long
in order to	to
in spite of the fact that	although
in the case of...	in..., for...
in the near future	soon

in view of the fact that	because
is known to be	is
it appears that	apparently
it is clear that	clearly
it is likely that	likely
it is possible that	possibly
it would appear that	apparently
of great importance	important
on the order of	about
owing to the fact that	because
prior to	before
reported in the literature	reported
subsequent to	after

This information has been taken from The ACS Style Guide:
http://www.oup.com/us/samplechapters/0841234620/?view=usa