

How to write and publish an article?

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GSEEE Summer Seminar, Siikaranta

Outline of this presentation

- Definitions and requirements
- Organisation of a scientific paper (IMRAD format)
- Tasks of the writing process
- How to prepare the different sections of the paper
- Where and how to submit the manuscript
- About the peer review process

The presentation follows the book of Day & Gastel 2006.
The figures are from Kauranen et al. 1993.

Scientific writing and scientific paper

Scientific writing: reporting of original research in journals, through scientific papers in standard format

Scientific paper: a written and published report describing original research results

There are also so called review papers the purpose of which is to review previously published literature and to put it into some kind of perspective. According to the definition above, a review paper is not a scientific paper.

Scientific writing and scientific paper II

Need for clarity

A scientific paper reports some new findings for the first time. When something is being said for the first time, clarity is essential.

Repeatability

The research methods and the material used have to be described so clearly that other researchers will be able to re-run the experiments.



Kauranen et al. 1993, drawn by T. Mikama

Organisation of a scientific paper

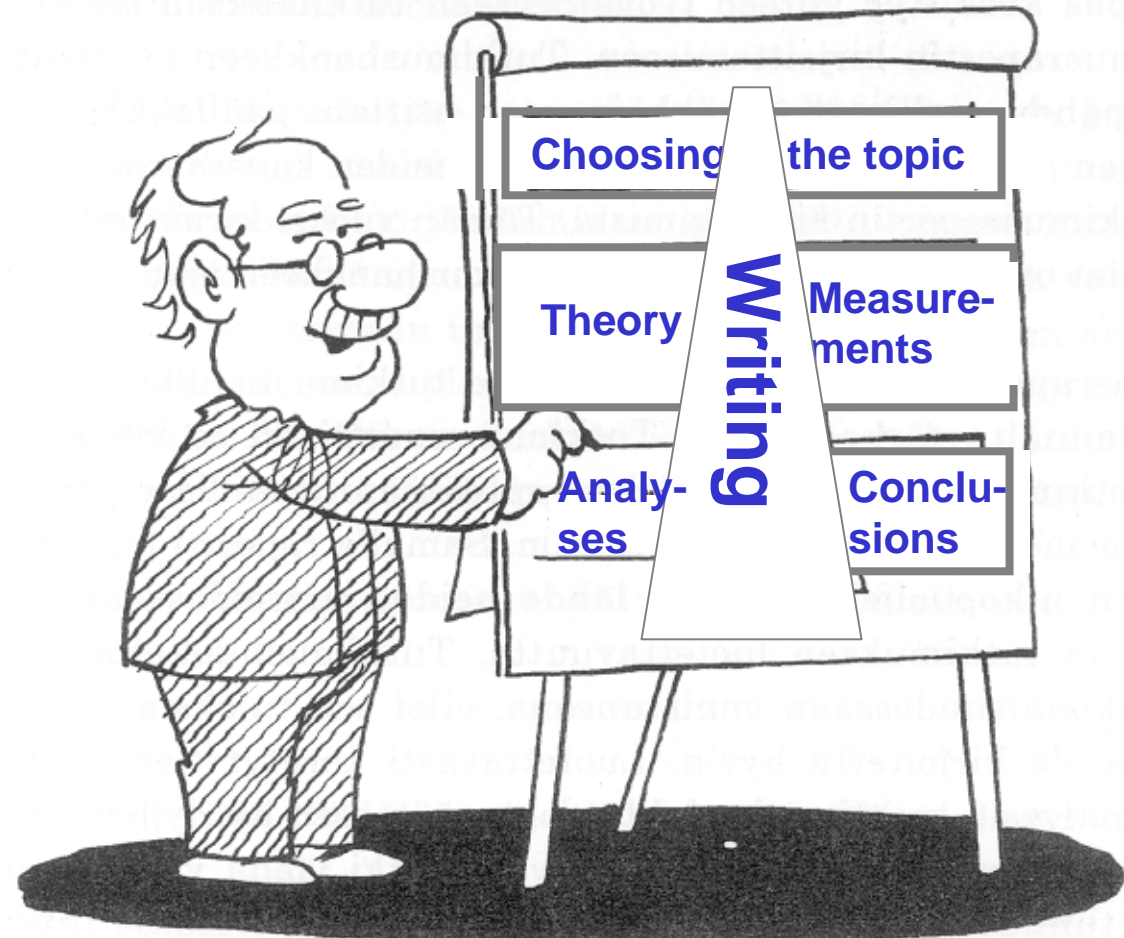
IMRAD format

- **I**ntroduction
- **M**ethods and Materials
- **R**esults
- **a**nd
- **D**iscussion

This basic structure can be applied in almost any scientific paper and/or technical report. By following this format, instructions of writing each of the sections are readily available and writing becomes a well/strictly defined process.

Writing process

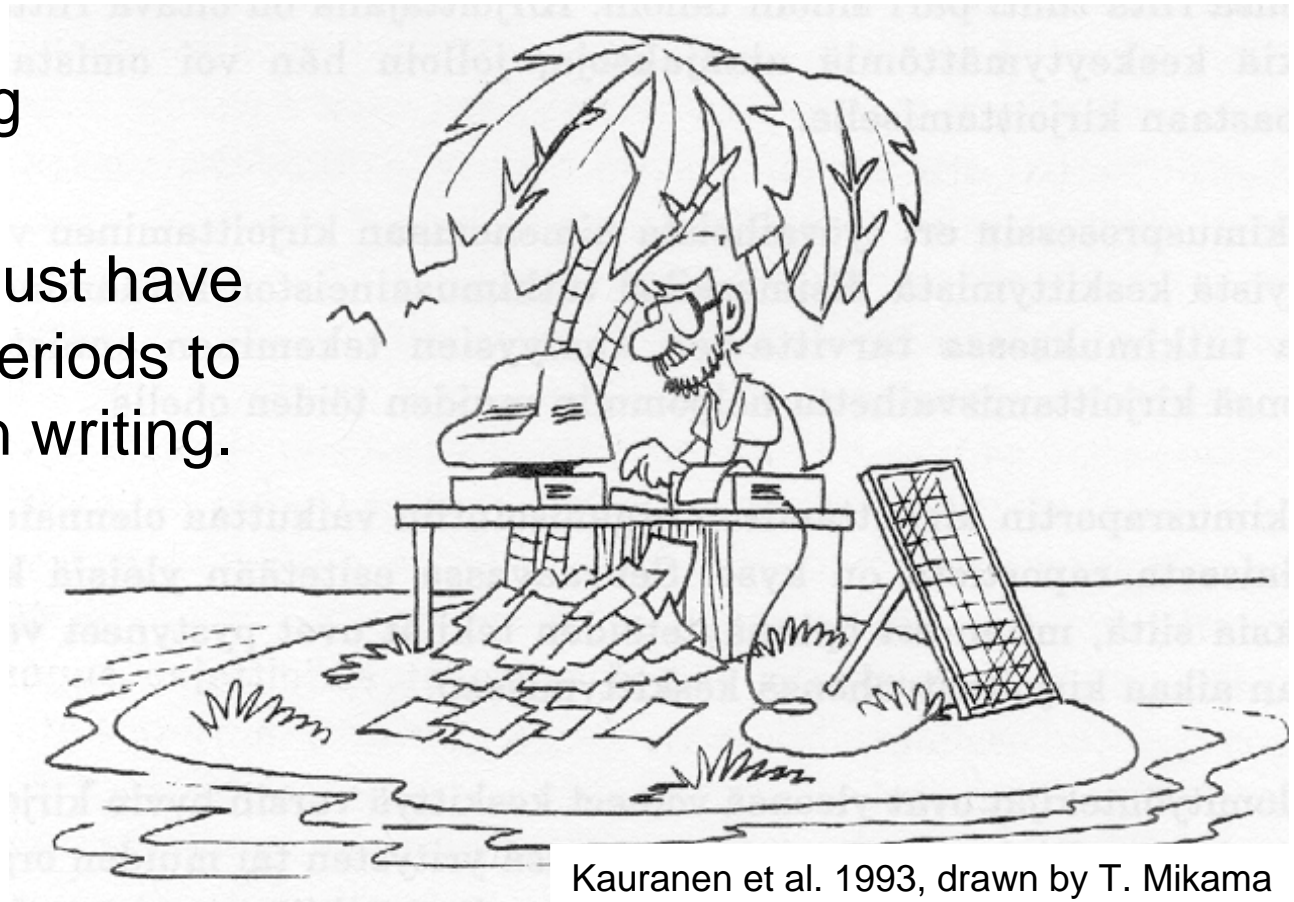
Writing a paper should go on simultaneously with the research work.



Time schedule

- 1/3 planning and collecting material
- 1/3 writing
- 1/3 finishing

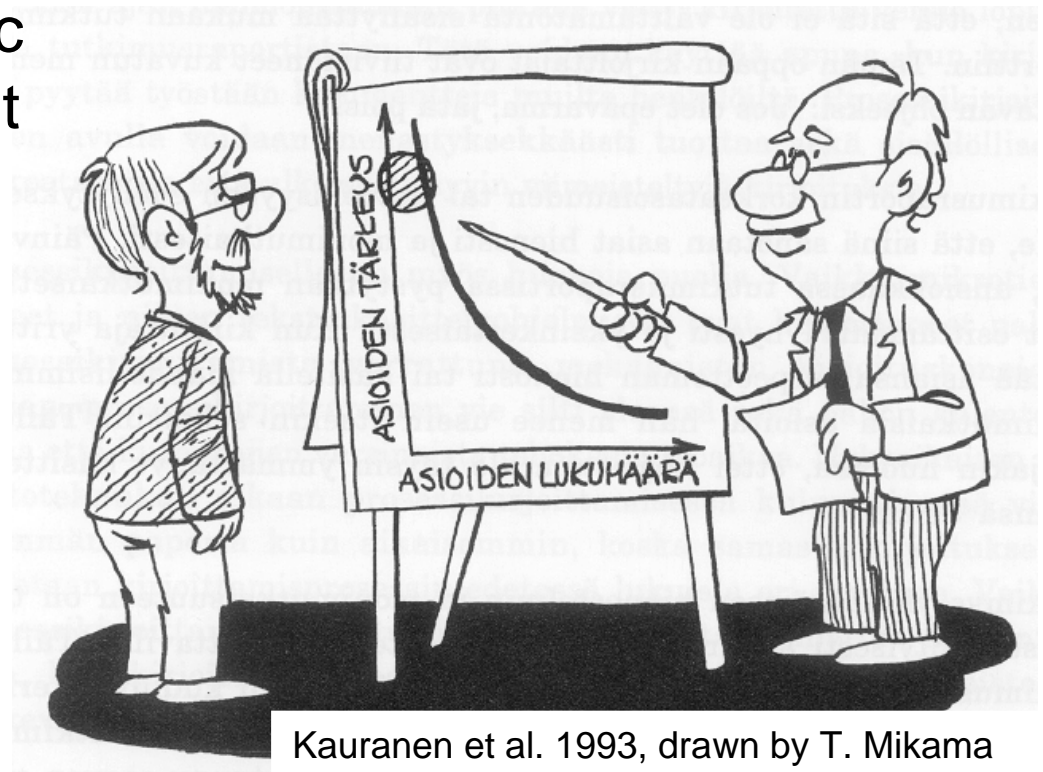
The authors must have long enough periods to concentrate on writing.



Kauranen et al. 1993, drawn by T. Mikama

Planning and collecting material

Typically, there are just a few really important things and an infinite number of things that are useless. When planning a scientific paper, one should find out the important things to focus on them.



Finishing the paper

Usually, we are in a hurry at the end of a project. The finishing phase takes time but it influences very much the impression the reviewers and readers get of the research.



Kauranen et al. 1993, drawn by T. Mikama

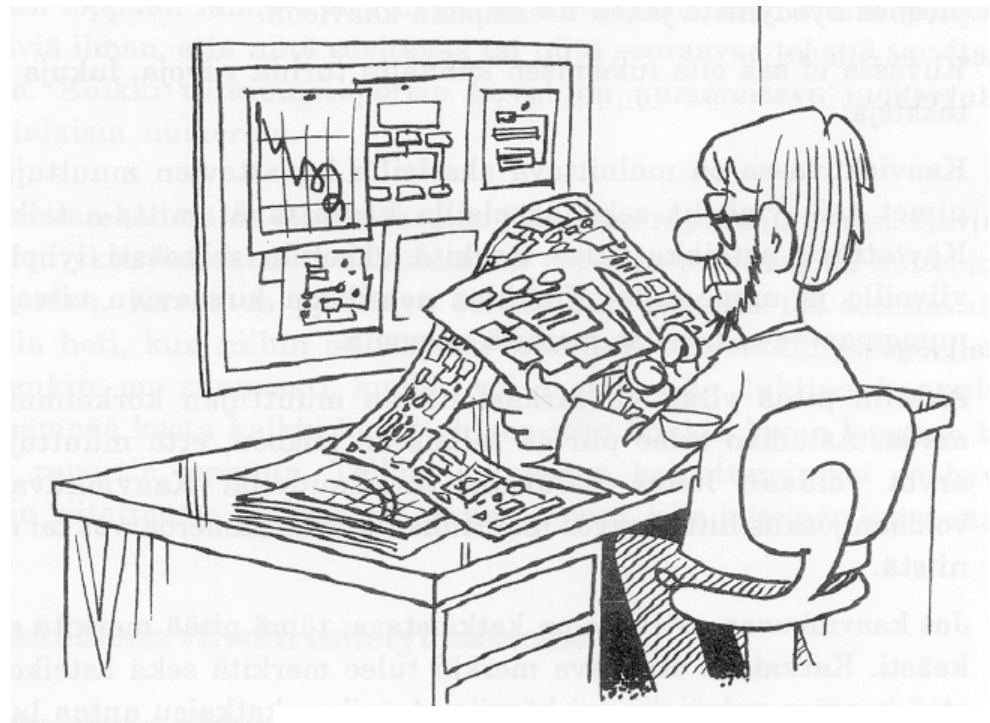
About reading habits

People read first

- Title
- Abstract
- Figures

These are the most important items for attracting readers

Figures should include data essential for reporting the new scientific findings, only.



Kauranen et al. 1993, drawn by T. Mikama

How to prepare the title

A good title: the fewest possible number of words that adequately describe the contents of the paper

Note: The title will be read by thousands of people – only a few people will read the whole paper.

Avoid “waste words”: Studies on ..., Observations on ..., etc. An opening “A”, “An”, or “The” is also a waste word.

Even if the aim is a short title, do not use abbreviations in a title.

How to prepare the abstract

By reading the abstract, a potential reader decides whether he or she will read the full paper.

Abstract is a short, independent description of the paper. It should include a brief summary of each of the main sections of the full paper

- Objectives and scope of the investigation
- Description of the methods employed
- Summary of the results
- Principal conclusions

How to write the Introduction

Introduction should supply enough background information to allow the reader to understand and evaluate the results of the present study. It should

- clearly present the nature and scope of the problem investigated
- briefly review the literature to orient the reader
- state the method of the investigation
- state the principal results of the investigation
- state the principal conclusions suggested by the results

Materials and Methods

The main purpose of this section is to describe the method of analysis or experimental design providing enough detail so that a competent researcher can repeat the experiments.

If your method is new (unpublished) you must give all the needed details. If the method has already been published in a journal, a literature reference should be given.

After this section, the reader should also be able to judge the appropriateness of the methods and the validity of the findings.

How to write the Results

In the beginning, you could give a kind of overall description of the experiment, provide the “big picture”, without going to the details of the previous section.

Second, you should present the data obtained. Consider carefully, if the essential data can best be presented just in a sentence or two within the text or if tables and figures are needed.

Strive for clarity. The Results have to be clearly and simply stated. Although the Results section is the most important part of the paper, it is often the shortest one.

Discussion section

In Discussion, you show the significance of your paper.

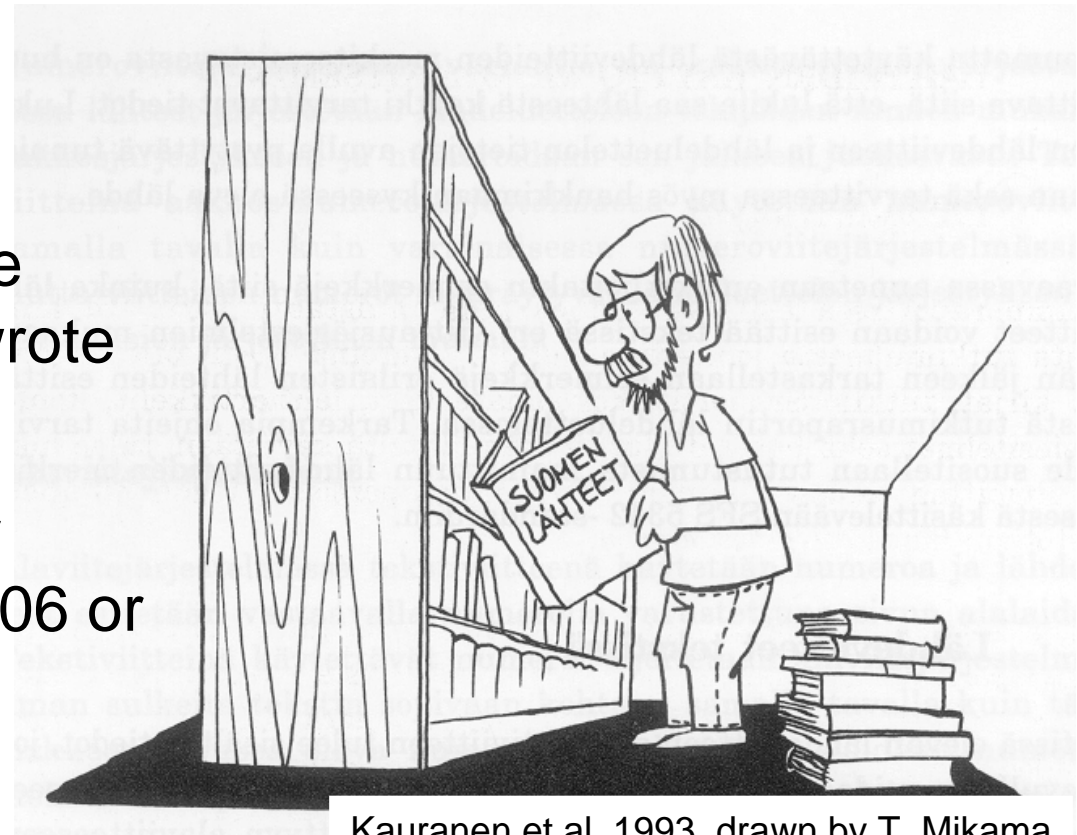
- Show how your results and interpretations agree with the previous published work
- Discuss the theoretical implications of your work as well as the potential practical applications
- State your conclusions clearly and summarise your evidence for each conclusion

How to cite the references

There are three commonly used ways to cite the references, the Harvard system (name-year system), alphabet-number system and citation-order system. Typically, the journal defines the citation method to be used.

As a reader, I prefer the Harvard system as I can immediately see from the citation who and when wrote the cited paper.

For more details see, for instance, Day&Gaste 2006 or Kauranen et al. 2007.



Kauranen et al. 1993, drawn by T. Mikama

Publishing the Paper

Choice of the Journal

It is best to choose the journal already at the beginning of the writing process. In this way, you can follow the writing instructions of the right journal.

Your research group probably has a list of recommended journals. You should also check in which journals the papers on your list of references were published.

Impact factor, time of review, accessibility, etc. may also affect your choice. Discuss with your supervisor.

Submission

Nowadays, each journal has a submission system available in the web.

Publishing the paper II

Review

After receiving your manuscript, the editor first checks whether the paper belongs to the field of the journal.

The editor chooses 2-4 reviewers and sends the manuscript to them asking for a reviewer's report, typically, within two months.

The reviewers are usually other researchers who have published papers on slightly similar topics.

If things go as planned, the author gets the editors decision together with the reviewers' comments within three months from submitting the paper. However, this may be a too optimistic time schedule.

Publishing the paper III

Revision

A typical editor's decision is: "We are willing to consider publishing the manuscript listed below, which you submitted to IEEE Transactions on Magnetics, pending your successful completion of the revisions which our reviewers feel the work requires".

This is actually quite a positive message as most of the papers receiving this decision will be accepted after the first round of revisions.

After receiving the editor's decision above, you should submit the revised paper together with a revision report within 2-4 weeks. In the report, you clearly indicate your response to each of the reviewers' comments.

Publishing the paper IV

The paper will typically be printed within six months from the date of acceptance. The whole process from the submission to publication takes 6 – 18 months.

References

Day R.A., Gastel, B. 2006. How to write and publish a scientific paper. Sixth edition. Cambridge University Press. 302 p. ISBN-10 0-521-67167-1.

Kauranen, I., Mustakallio, M., Palmgren, V. 2007. Tutkimusraportin kirjoittamisen opas opinnäytetyön tekijöille. Otaniemi, Teknillinen korkeakoulu. Toinen painos. ISBN 951-22-8359-X.

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