Writing a Technical Paper*

free after
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Abstract

An abstract typically consist of 100-200 words. It should be written to be understandable independent of the text. The abstract should answer the questions:

- What did I do ? (objective – may be in title)
- Why did I do it ? (background – 1 sentence if at all, only for broad readership)
- How did I do it ? (procedure – highly compressed)
- What did I find out ? (results and conclusions)
- What does it mean ? (implications/recommendations)

Of course, the paper should also answer these questions.

1 Introduction

The introduction has the following ingredients, in this order:

1. Statement of the problem
2. Significance of the problem
3. Work by others in the field: similarities and differences with your work.
4. Definitions and limitations
5. Roadmap (overview of what is in the paper)

The introduction should be written after the body of the paper has been written.

*A title can have approximately 14 words; use it to state the objective(s) and, if possible, results or findings of the paper.

2 Criteria

The criteria for judging a paper are, in order of importance:

1. **logic and accuracy**
2. **organization**
   (a) summarize at the top
   (b) make division clear
   (c) make order clear
   (d) make significance apparent
3. **language** (should be direct; use brief, short sentences and paragraphs; define your terms)
4. **layout** (headings, subheadings, styles and fonts)

3 Versions of a Paper

Writing a paper is hard. Typically, people cannot do it for more than 3 to 4 consecutive hours; also, there may be a best time of day for you. A paper needs 3 to 4 versions. In each version, concentrate on the following only:

- **Version 1: Contents.** Collect information, start writing the easiest parts to get started, do not worry about the order of sections and paragraphs.
- **Version 2: Logic.** Order the contents logically, discarding extraneous sections and writing new sections if necessary.
- **Version 3,4: Language.** Say things better, and go through the paper with the editor's checklist (see Appendix A).

You should *not* correct language and need not improve formulations in versions 1 and 2. Do *not* read the paper over and over again in your most precise setting – you will get blind to flaws. Instead, improve the paper top-down, in the way indicated.

4 Results

Questions to ask yourself for the 'Results' section:

- Did I summarize the data ?
- Did I include sufficient data to support the conclusions ?
- Did I include unnecessary data ?

5 Conclusion

Questions to ask yourself for the conclusions:

- Did I point out the important features of my work ?
- Did I interpret and compare ?
- Did I point out limitations ?
- Did I relate all of this to my original intention ?
- Did I solve the problem ?
- Did I point to recommendations ?

References

[1] Anne Eisenberg, *Writing Well for Techical Professions*, Harper & Row Publishers, New York, 1989.

[2] Frederick Crews, *The Random House Handbook*, 5th Edition, Random House, New York, 1987.

A Editor's Checklist

Mend the following possible errors in consecutive passes over the paper:

- wring the water out (i.e. take out redundant words, use active verbs, use shorter statements, etc.)
- spelling errors
- pronoun-antecedent errors
- modification errors
- subject-verb agreement error
- parallel errors
- comma-semicolons-colons usage errors
- improper use of definite/indefinite articles[1]

For explanation of these terms, see [1, 2]. Catching 40% of the above errors in any one pass is considered quite good.

B Writing a Memo

There are two standard formats:

1. **problem/solution**
   - paragraph 1: statement of the problem
   - paragraph 2: statement of the solution (1 to 2 sentences)
   - paragraph 3-6: details
2. **main idea/significance**
   - paragraph 1: main idea (what)
   - paragraph 2: significance (so what)
   - paragraph 3-6: details

[1] mainly for native speakers of languages without articles