The Essential of Successful Scientific Paper Writing

Ref: Matt Young, *The Technical Writer's Handbook*, University Science Books (Mill Valley, California, 1989)

The Style

I. Be careful in **the use of tense**:

Follow the rules:

Present tense is chosen to report the "background knowledge" that is already established, such as accepted facts and principles;

Future tense is used to refer to the work that you will do; and

Past tense is used to describe results of a specific study. Since research papers reflect work has been completed, **use past tense throughout your paper**, including your expectations and hypotheses.

II. Use **active form** (verbs) whenever suitable.

III. **Avoid the use of contractions** (*e.g.*, I'm, I don't, etc.) when possible. In addition, never abbreviate units of measure in a non-data context. You can abbreviate units of measure (such as cm, mm, min, g, *etc*., except temperature unit) when using them with data (*e.g.*, 2 cm, 1 kg, etc.).

IV. Never write a paragraph with only one sentence.

V. Always use simple formulation and **short sentences**; to be **precise** word use, **clarity** and **brevity** (i.e., be explicit).

VI. Every Figures and Tables must be labeled, captioned, and be properly referred in proper portion of your text. Do not let your readers to find the meaning of the Figures themselves.

Title

I. Carefully choose all words in title. **The best title is the one with fewest possible words** while can describe the same contents of the paper.

II. **Avoid the uses of abbreviation and jargon** in title.

III. Remember that title is **only a label**, but not a sentence.

Abstract

I. **Make your abstracts informative (a short summaries of your paper), not descriptive**. A good abstract shall contain your **objective**, **scope of the study**, brief **summary of the results**, and **conclusions**.

II. In one **single paragraph**.

III. Use **active voice** when possible.

IV. Use **present tense**. (Summary of work done can be presented in past tense).

An example of an informative abstract (better)→ Saturable dyes for laser Q switches degrade with time. The blue light from the flashlamp causes the degradation of the dye, and the dye's life may be extended by replacing the cell's windows with red filters.

An example of a descriptive type abstract (poorer)→ Saturable dyes for laser Q switches are found to degrade with time. The cause of this degradation is discussed and a possible solution is proposed.

Introduction

I. Provide appropriate **background knowledge** to bring out the purpose of the study. Usually present the knowledge to justify why your paper is an advance on the field by starting at the accepted state of knowledge, then focusing on a particular aspect related to your paper to bring out the objective of the study.

II. Offer **brief and balanced review** of the pertinent published literature (with proper citations), and point out the drawbacks of existing methods.

III. Remember to state your hypotheses, **objective**, and include **one or several major conclusions**.

Main Section of a paper usually includes Results and Discussion. Structure your explanations before starting to write.

Results

I. Never use raw data, instead use **processed data** with the best method (do not present your data processed by two or more different ways simultaneously). Preferred presentation format of data is in the order of Figure, Table, and simple text.

II. Objectively present your **key results in an ordered and logical sequence**.

III. Do not draw conclusion at this section and also do not simply leave your data to your readers without a proper mention in text.

Discussion

I. **Interpret your data** in discussion section.

II. Always try your best to **decide if each hypothesis is supported or rejected**. If it is inconclusive, suggest how the experiment (or study) being modified in order to test the hypothesis. Do not simply drop it!

III. Refer to work done (yourself or other specific individuals) in **past tense**. Refer to generally accepted facts or principles in present tense.

IV. Based on your current study, state **where do you go next**. Always come up new hypothesis and suggest new study for the main question stated in your introduction section.

Conclusions

The conclusions of a paper are not just a summary of the paper. State your conclusions firmly. If some of the conclusions are tentative, use words like *probably* or *we think*. For example, don't begin your conclusions like

We have used photothermal deflection to measure the loss in a waveguide.

Instead begin

Photothermal deflection is a promising technique for measuring the loss in a waveguide.

Then go on to support your conclusion by following the following guidelines.

I. Reach **the conclusions about the objective** stated in Abstract.

II. Show **the advantages** of the research method described in your paper.

III. **State open problems** and cases that your method does not work sufficiently.

IV. Identify **needed next steps**.