

The Challenge of Advanced Scientific Writing: Mistakes and Solutions

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Abstract

This essay presents four common mistakes committed by advanced students preparing manuscripts and other scientific writing: trying to do too much, failing to tell a story, using flowery language, and inconsistency in terms and labels. Strategies are outlined for mentors to guide trainees to rectify those mistakes, and for students to work themselves to overcome them.

Keywords

advanced writing; mentoring; teaching writing; scientific manuscripts

Introduction

When outstanding doctoral students and postdocs are recruited, faculty members may assume those individuals are skilled writers. In reality, the students may possess basic writing skills but lack advanced ability needed to succeed in academia (Casanave & Hubbard, 1992; Maher et al., 2014).

This commentary offers thoughts on four common mistakes I witness among advanced writers, providing straightforward solutions mentors can offer to improve their trainees' writing as well as ideas for students to overcome common mistakes themselves. The focus is on writing peer-reviewed scientific manuscripts, although lessons readily translate to theses and dissertations, grant proposals, and other advanced writing assignments. The goal is twofold: (a) illustrate common mistakes I see among advanced writers and (b) provide thoughts on how both mentors and students themselves can work to overcome these writing errors.

Mistake #1: Trying to Do Too Much

I repeatedly observe that eager young scientists want to cover everything, ideally in one place. Unfortunately, busy reviewers, editors, and readers want to grasp material quickly and easily. Priorities collide. The solution is to simplify. Students might outline key ideas prior to writing, limiting text to ideas directly pertinent to those key ideas and the manuscript's thesis. Extraneous material can be retained for other publications.

Mentors should also remind trainees that thorough literature reviews are essential, but a manuscript introduction need not include all reviewed materials. Similarly, study results should focus on primary hypotheses; secondary analyses can be presented elsewhere, such as other manuscripts or conference abstracts. Discussion sections should be focused and targeted, not extending beyond the study's goals and topics.

To overcome this mistake, students should attend to each sentence and paragraph one-by-one, confirming it contributes to the overarching thesis of the paper rather than distracting readers with ancillary material.

Mistake #2: Failing to Tell a Story

Scientific prose is not fiction, but it should still tell a story. Quality scientific writing has a beginning, a middle, and an end. It walks readers through the scientific inquiry in a logical and ordered fashion.

I notice that advanced writers frequently fail to connect ideas in a logical fashion. The ideas are all present, but they are thrown together in a mishmash, confusing readers unfamiliar with the research. I recommend students take the reader's perspective: Pretend you know nothing about the study and read the paper with that perspective. Such readings can lead to reorganization and clarity. Peer reviews can aid with this task also: How do peers react to the text as it is, and where do they become confused with the logical flow?

Another helpful strategy is to remove all text and consider the ordering of headers. Are they sensible? Similar reviews may be conducted by paragraph: Does the thesis of each paragraph flow from the previous one, or should information appear in a different order? Mentors can easily guide students to complete such exercises.

Mistake #3: Flowery Language

Zinsser's (1976) *On Writing Well* expresses this point magnificently. Writing should be succinct. Choose descriptive verbs. Delete unneeded adjectives and adverbs. State points and move on.

Advanced writers must study each word and each sentence, delivering ideas efficiently and explicitly so readers grasp them without distraction or delay. Mentors can request such reviews from their students.

Mistake #4: Inconsistency

Repetition is appropriately viewed as negative in prose writing, but scientific writing sometimes requires repetition. When a construct is carefully described with a particular label, that label should be used consistently throughout the manuscript. Changing terms midstream—a common error I observe in advanced students' work—confuses readers and clouds science, as does rotating between multiple terms or labels for the same construct. Scientific writing can and should be pleasant to read, but it also must be precise. Repetitiveness in semantics yields precision.

In conclusion, the rigor of the scientific process does not end with one's scientific methods. Those methods—and the results of those methods—must be conveyed clearly in writing to effectively deliver science to its audience. Mentors can help students overcome these four common mistakes I see in my trainees' writing. Students should become aware of the mistakes and work to resolve the errors themselves. With practice, attention, and diligence, each mistake can readily be overcome, permitting quality science to be disseminated clearly and accurately.

References

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