

The points raised above should not, however, overshadow the strengths of this volume. The rigor with which the steps in conducting the study are described gives the reader a clear picture of the results obtained and whether they can be applied or extended. The authors have succeeded in this regard. From a more personal point of view, I liked that the book resembles an extended journal article reporting three experiments. This feature, plus the detailed and clear description of the steps taken, makes the study very smooth to follow.

To conclude, this book is an innovative addition to the list of contributions on vocabulary research. It is systematically presented and detailed. It is recommended to researchers in the field. While language teachers may not find practical techniques in teaching vocabulary on the areas investigated, they can obtain insights on instruction and classroom research.

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Write like a chemist: A guide and resource, Marin Robinson, Fredricka Stoller, Molly Costanza-Robinson, James K. Jones. Oxford University Press, Oxford (2008). xx+698 pp., US \$49.95 (paperback), ISBN: 9780195305074

Write Like a Chemist is a remarkable book that deserves attention from chemists and non-chemists alike. At 698 pages, it is no “short guide” to writing in chemistry, and some potential readers may be put off by the sheer size of the book. However, the length results from many of the book’s strengths: multiple perspectives on multiple genres in chemistry; incorporation of research findings about chemists’ language choices; numerous authentic, illustrative texts; and realistic coverage of variability in texts. *Write Like a Chemist* is the most thorough treatment of writing in a specific discipline that I have ever seen. Chemists will appreciate its specific content; others can learn from its methodology.

The preface describes the book as “designed to be used as a textbook in upper division and graduate-level university chemistry classes and as a resource book by chemistry students, postdocs, faculty, and other professionals who want to perfect their chemistry-specific writing skills” (p. vii). This mission is obvious throughout. On a more general level, however, the pedagogical approach in the book should be useful for any teacher of writing to examine. The book applies a “read–analyze–write” sequence, asking students to read numerous extracts of real papers, to analyze them for their rhetorical organization and language choices, and

then to write their own papers, applying information learned in the analysis. Such an approach can be used in any discipline to develop students' skills and to help students learn to adapt writing to different audiences and purposes. Furthermore, any applied linguist or ESP practitioner should be able to appreciate the book as the culmination of an exemplary large-scale, interdisciplinary project. It incorporates both rhetorical analyses (of move structures) and analysis of a 1.5 million word corpus of chemistry texts. It demonstrates the importance of collaboration between disciplinary experts and language experts for fully understanding and explaining writing choices. It illustrates how research on texts can be translated into useful materials for teaching writing. While none of these features are unique to *Write Like a Chemist*, the scale of the overall project and the resulting book are unusual. Researchers and materials writers may find it useful to examine the book in conjunction with articles about various aspects of the project (e.g. Stoller, Jones, Costanza-Robinson, & Robinson, 2005; Stoller, Horn, Grabe, & Robinson, 2005).

The book focuses on four academic genres: journal articles, conference abstracts, scientific posters, and research proposals. The overall organization of the book is both logical and complex. Section 1 has an introductory chapter, and then 14 chapters divided into three "Modules" that cover the four genres. Module 1 (Chapters 2–7) is focused on the journal article. Module 2 (Chapters 8–10) covers the conference abstract and scientific poster. Module 3 (Chapters 11–15) describes the research proposal. Section 2 of the book consists of three chapters that are applicable to all four genres. Chapter 16 covers the formatting of figures, tables and schemes. Chapter 17 explains citations and references. Chapter 18 is "Finalizing Your Written Work," with tips and procedures for doing final revisions and editing. Two appendices are also included. Appendix A contains "Language Tips," which cover grammar, punctuation, word use, and various conventions of writing. Appendix B is a compilation of the visual representations of the rhetorical move structures of the four genres. The book has plenty of white space, easy-to-read headings within chapters, and icons to mark certain types of information, as well as an index that is helpful for finding specific information. The organization and layout are effective; nevertheless, students and teachers who are used to a consistent hierarchical structure in chapters and units may at first find it a challenge to keep track of the parts of this book.

Chapter 1 is crucial for introducing general information and concepts. It provides an accessible description of rhetorical moves and clearly explains the usefulness of analyzing rhetorical organization, the need for a genre approach, and the importance of audience and purpose in shaping writing. The explanation of an audience spectrum from "expert" to "scientific" to "student" to "general" is useful, but misleading in not acknowledging the teacher audience. Chapter 1 explains, "An important goal of this textbook is to help you move beyond writing for a student audience (the targeted audience in many undergraduate lab reports) and begin to write for expert and scientific audiences" (pp. 10–11). The "student audience" has been defined as "readers learning chemistry" (pp. 10) when students usually write for their teachers, not each other.

The three modules in Section 1 follow a fairly consistent pattern. A general overview of the target genre's purpose and overall structure is first provided. Chapters then discuss the different sections of the genre in detail. Each chapter is framed by clear objectives at the beginning and a chapter review at the end, which allows students to check their understanding of the most important information. Each chapter has exercises throughout, as well as additional exercises at the end. There are more exercises than any single class is likely to do, but teachers should appreciate the flexibility allowed by the numerous activities. In addition to more controlled exercises, the chapters also progress through "Writing on Your Own" exercises that lead students through writing complete papers in the different genres. Some chapters include peer review activities. Throughout the chapters there are references to the language and formatting information in Section 2 and Appendix A, as well as useful lists of phrases commonly used for certain meanings (from the corpus analysis), nutshell restatements of important points, and definitions of terms.

To get a sense of the chapter content, consider Chapter 5, "Writing the Discussion Section." In keeping with the books' realistic description of textual variation, it begins with an explanation that some journal articles integrate results and discussion, while others have separate discussion sections; examples of both kinds are contained in the book. A general explanation of the functions of the discussion section follows, emphasizing the importance of making interpretations but not over-interpreting. The most common hedges in scientific papers, based on the corpus analysis, are presented as part of the discussion of not over-interpreting.

The chapter then has four major sections, as do most of the chapters in Section 1. "Reading and Analyzing Writing" asks students to read the discussion section of a journal article that is reprinted in the book and then

propose a move structure and find instances of hedges, thus providing useful concrete ties with the general introductory information. The second major section is “Analyzing Audience and Purpose.” It contains useful discussion about the need to appeal to different audiences in different parts of the discussion section – specifically, that interpretations are generally written for an expert audience, but the broader implications of the findings should be understandable by a scientific or general audience. In exercises, students identify sentences appropriate for different audiences and tie them to their purposes. The third major section, “Analyzing Organization,” describes the rhetorical moves in the discussion section (“Discuss Specific Results” and “Conclude the Paper”) and submoves within each. Exercises have students identify the submoves in extracts of several different discussion sections.

The fourth section, “Analyzing Excerpts,” is by far the longest section and provides the most specific analysis of the writing in published articles. This section has two parts. Part 1 analyzes examples of each of the submoves in detail. Students who are not fully engaged might find the explications tedious, but anyone committed to learning how to write in chemistry should appreciate the carefully explained examples of previously covered general concepts. For example, the explication of one short passage demonstrates how hedges are used in stating the interpretation, how support is given by referencing previous research, and how over-interpretation is avoided by not speculating without evidence. Part 2 of “Analyzing Excerpts” focuses on language choices that occur throughout the discussion section. Verb tense and voice, the use of “we,” and hedging words are covered, based on the empirical analyses conducted for the book. Language choices are connected to their purposes and clearly illustrated. For example, a table covers 7 different functions for tense-voice combinations with explanations and examples. Active voice transitive verbs and intransitive verbs are grouped together, a reasonable simplification given the audience for the book.

Throughout the chapters of Section 1, there are numerous references to the chapters in Section 2. These chapters are likely to be useful as resources so students can, for example, look up exactly how to format a table or citation when they need to. However, these chapters can also be used as a textbook; explanations are clear and well exemplified, and the exercises provide concrete practice, often having students identify and correct common errors before moving to more open-ended tasks. The final chapter “Finalizing Your Written Work” provides thorough guidelines for final revisions of papers, including everything from larger content issues (e.g. “Review Science Content”) to specific page layout issues (e.g. “Examine Formatting and Overall Appearance”).

Like Section 2, Appendix A, “Language Tips,” is also referred to numerous times in Section 1. It contains some predictable items in grammar and punctuation, such as parallelism, split infinitives, and comma use. There are also topics that are especially useful for chemistry, such as the formatting of numbers and units, and punctuation of two-word modifiers. All topics are illustrated with examples from chemistry; for example, two-word modifiers include “solvent–solute interaction” and “phospholipid-coated capillaries.” There are exercises for improving word choice, such as substituting “establish” for “set up,” and for disambiguating commonly confused pairs such as affect/effect, fewer/less, and comprise/compose. If chemistry students are anything like other students, these will be useful exercises indeed! Even more noteworthy are topics such as “Fluid Writing,” which (in less technical terms) covers the principles of end weight (longer constituents at the end of a sentence) and information structure in English (given information before new information). Answer keys accompany the exercises for this appendix so students can check their own work. Even on its own, the appendix would make a useful small writing handbook.

The book is accompanied by a *Write Like a Chemist* website (<http://www.oup.com/us/companion.websites/9780195305074/?view=usa>). Among the useful materials are “canned” research projects (so that students can practice writing with data given to them rather than having to plan and conduct their own research), peer review memo forms, and resources for faculty (such as grading rubrics).

Readers of *English for Specific Purposes* may be especially concerned about the book’s appropriateness for second language speakers and diverse teaching contexts. These are not given special attention, but the book treats the writing of chemistry as a new culture and new language for *all* readers. There is therefore no reason why the book would not be effective in any context where students’ goal is to write for the international chemistry community and their language skills are advanced. Teachers should be forewarned, however, that the book was piloted in the United States, and some exercises – such as peer reviews – may need to be adapted for different contexts.

Because of its length and complexity, *Write Like a Chemist* is not a book for anyone who is easily overwhelmed by a large amount of information. However, in reviewing the book, I could not identify any material that could have been omitted without decreasing the book's effectiveness. This is a book for readers who truly want to develop their writing skills and who appreciate realistic information about just how complex writing skills are. Anyone who is serious about learning to write in chemistry should own this book; anyone who is interesting in researching or teaching writing for any discipline will benefit from looking at the approach taken here.

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