DESIGNING WEB-BASED APPLICATIONS FOR 21ST CENTURY WRITING CLASSROOMS

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CHAPTER 10

Developing a Web-Served Handbook for Writers

Stephen A. Bernhardt

Over the past 5 years, I have been working with publisher Bedford/St. Martin's to develop an electronic handbook for writers. While I write this chapter, we have a full, working beta version of *Writer's Help*—an XML-based, Web-served handbook—which is being piloted in classrooms. By the time you read this chapter, the book (to favor the traditional term) will be for sale and in use in writing classrooms. You can see the marketing page at writershelp.com. From there, you can request a log in to test drive *Writer's Help*. The name reflects a product that crosses a writing handbook with a help system.

Our goal was to create a reference handbook that addresses a known and very common problem: students can have information at hand about grammar, usage, or citation practices, but still not be successful at accessing and using that information to address their own needs as writers. They may not overcome the inertia that prevents them from getting a book off the shelf and figuring out how to use it. If students do crack a reference book, they may struggle to define their writing questions in ways that match the terminology of the book. We know students have trouble using the technical grammatical terms of a reference handbook, and we know they are often confused by the complexities of academic citation styles. We also know that students frequently find what they think is an answer or a model, but mistakenly alight on the wrong information. If students look for answers online, they may be overwhelmed by what they find. Like the rest of us, students are increasingly conditioned to Google their way to all knowledge, even if Google tends to return thousands of targets, some relevant and many not.

We should not underestimate the difficulty of fixing a writing problem using a handbook, whether print or online. Reference handbooks are written in language about language—essentially metalinguistic abstractions about a highly abstract symbol system. Each reference book organizes myriad and complex topics in both systematic and often arbitrary ways, with many local decisions about how to organize and map the content. Students need to develop a mental map of the book and of their own query that matches that of the authors of the reference source. Students have to call upon

ticated knowledge and control of terms to define a problem, search for an answer ndbook, match their problem to explanations and examples in the text, and then e referenced information back to their problem space, where they apply the to their own language. There are opportunities for missteps at every stage: in g to terms with their problem, in formulating the search target, in knowing r an example is a good match, in understanding explanatory text, and in applying ation to a text passage.

thinking has been that an electronic, Web-based resource might be able to s the problems that students experience when using reference handbooks as they n their writing.

e could move rich, layered content online, into the browser, so students have cess as they are writing.

e could develop an intelligent search engine, one that would use the language both students and teachers to help students target a limited pool of topics likely be helpful to writers.

e could implement tagging, electronic notes, search traces, and other features help a writer keep track of and return to valuable help.

e could implement social tools so students can see what other students are doing, d so that instructors can make good classroom use of the resource.

e could create a product that would grow with its users over time, one that uld be increasingly responsive to their needs and of ever-increasing value.

is chapter, my purpose is to highlight the development process, demonstrating e have worked to create an application that is well-suited to the ways students out writing, that addresses the kinds of help they need, and that takes advantage ffordances of an electronic resource.

of the pleasures of this project has been the experience of true teamwork. I write "we" in this article, I am referring to the development team. The team together Bedford developers and editors, building on their deep handbook nce. New media specialists have contributed their expertise to interface design, y testing, XML coding, and e-book design. Talent external to Bedford has been d to assist with programming search and navigation, while design consultants ntributed to the interface and display of content. Importantly, authoring the f tools explored in this collection typically involves teams working to realize d vision. Sometimes those teams coalesce around open-source learning ls, sometimes around software or a Web site to support a department writing n, writing center, or university initiative. In this case, the collaboration is rcial, but the project triggered the best kinds of team effort, problem solving, perative, participant-centered design.

THINKING ABOUT ELECTRONIC TEXTBOOKS

vident that the textbook market is changing rapidly. A recent report (Reynolds, uggests that electronic textbooks will grow by 100% per year over the next 5

years, followed by another 5 years of 30% annual growth. The same report notes that major changes are on our doorstep:

> Over the next five years, digital textbook sales in the United States will surpass 18% of combined new textbook sales for the Higher Education and Career Education markets. This increase will boost revenues for digital textbooks to more than $1 billion and necessitate a general overhaul of traditional textbook production processes. The growth will also create avenues for new content publishers to enter the textbook market, lead to fundamental shifts in purchasing patterns around learning materials, and expedite the formal adoption of open educational resources to augment premium digital content. (para. 1)

A report from EDUCAUSE suggests that we are finally "nearing the end of the era of hype" with regard to e-books in higher education, with more college students looking for lower-cost texts in portable format (Nelson, 2008). Barnes and Noble, Amazon, and Apple are all zeroing in on the expanding textbook market created by e-readers. There are many reasons the movement to e-textbooks has been stuttering: e-books did not have the affordances of print to support the kinds of reading and studying that students do (note taking, for example), simple conversions of books to pdf or other reader formats did not support a satisfying user experience, and the limitations of the reader hardware itself made extended reading less than comfortable or efficient. All of these limitations are rapidly being addressed.

We are optimistic that *Writer's Help* can find a niche in this changing market. We are working on the assumption that the book is not "one-and-done," that students will continue to use *Writer's Help* because they develop the expertise to use it and a reliance on it in their first-year composition class. We know many students hang on to their handbooks, so there is good potential for continued use among students in business and technical writing classrooms and in writing-intensive classes across the disciplines. With the right framing, an online handbook could also benefit audiences of working adult writers. If well-designed with appropriate content, the handbook could move with the writer across situations of composing.

Early in the planning stage, we debated whether we needed new content from the ground up, or whether we might rework existing content. Bedford is justifiably proud of its best-selling handbook, *A Writer's Reference*, by Diana Hacker and Nancy Sommers (2010). The book has a loyal following of teachers across many campuses, in both community colleges and universities. The content has been thoroughly tested and refined over multiple editions. The achievement of the book is the careful, direct, and precise language, which offers explanations that students understand. Additionally, the original design was innovative among handbooks—a spiral-bound, tabbed, highly modular book with clever visual cueing of content and examples. The book took the market by storm and has dominated since. We made an early decision to base the new electronic *Writer's Help* on the existing, classroom-tested, effective content of *A Writer's Reference*. From the beginning, we agreed it would be critical to preserve the best features of the existing book while taking full advantage of the dynamic possibilities of an online presentation.

The team at Bedford committed substantial resources to the development process: r gathering information on how students and teachers use handbooks, for collecting er feedback and conducting formal usability testing, and for reviewing and piloting e resource in classrooms. At every step of the way, we sought confirmation for r design decisions, advice about content and organization, and feedback from our er community:

- Web-based surveys of over 850 students at three universities and three community colleges
- Focus groups with eight groups of teachers and writing program or center directors (42 total participants) over 5 years at the CCCC conferences
- User testing with approximately 250 students on six campuses to gauge their interaction with the emerging prototypes
- Formal testing with ten students during spring 2009 and nine during spring 2010 in the usability lab at Texas Tech University under the direction of Prof. Brian Still
- Reviews of an advanced, fully functional prototype by 25 writing instructors at various colleges and universities
- Meetings with graduate teaching assistants to review and comment on content and design
- Beta testing in classrooms before commercial release (ongoing as I write)

The flow of information from student and teacher testers, who performed repre-ntative tasks on both early and advanced prototypes, shaped all our decisions. 'e followed an iterative, participant-centered design process: developing wireframes, etting user feedback, and talking with instructors and program directors to show em our ideas and get their responses before going back to a new round of redesign d content revision. Internally, many eyes were on the product throughout develop-ent, with weekly discussions and team decision making. The process relied on eep collaboration.

ACCOMMODATING STUDENTS IN THE INITIAL DESIGN

To make *Writer's Help* as useful as possible, we were determined to get to know r audience. We wanted to learn how students currently use reference handbooks, w such tools figure into their writing processes, and what sorts of things they nd to look up in their handbooks. We surveyed over 850 students from seven stitutions. In general, we felt certain from student responses that we were on the ght track with our product development. We knew that students would be in a sition to use a Web-served *Writer's Help*, and that they would be able to migrate eir existing practices from print to online, or from existing online resources to a ew, more targeted resource.

The survey responses from students support the following generalizations. he ranges in these 2007 data represent the range of student responses for the ven schools.)

- Most students (about 90%) write papers on their personal computers, almost always with Internet access. Students at one community college were more inclined to draft on paper (35% *always* draft on paper; 29% *frequently* do so) and not to have Internet access while writing (though 73% *always* or *frequently* have access). Even among this group, composing while connected is the norm or will soon become the norm.
- While writing, students *frequently* look for online help (45–85% of the time). Students also *frequently* consult a print handbook (36–42% of the time).
- Students *frequently* consult a handbook for advice on (a) organizing papers, (b) following documentation styles, (c) using and evaluating sources, and (d) revising and editing.
- Students *less frequently* consult a handbook for (a) advice on topic choice and thesis statements, (b) drafting, (c) choosing visuals, (d) writing job-application materials, or (e) preparing presentations.
- Community college students are *more likely* than university students to consult a handbook for advice on (a) grammar, (b) punctuation, and (c) document design and format.
- Students suggest that all handbook features are *useful*: headings, explanations, examples, charts, model papers, and citation models. Very few describe any of these features as *not useful*.
- Students find all navigation features *useful*, with very few describing these features as *not useful* (see Table 1).
- Students say they are *most likely* to use e-book features such as tables of contents, indexes, and search. They say they are much *less likely* to use previous/next arrows.
- Students are *more likely* to buy a print handbook (68%–91%) than a Web version (9%–32%).

These data suggest that significant numbers of students rely on both print handbooks and Web searches to find information they need as they compose online. The data were useful in suggesting that the conditions of composing are such that an electronic handbook would have a potential audience, and that the audience would be poised

Table 1. Navigation Feature Usefulness

Feature	Always or mostly useful
Index	80%–97%
Table of contents	46%–100%
Tabs	42%–88%
Color coding	46%–82%
Codes your teacher uses	19%–53%

o take advantage of both the content and the features of a well-designed online ıandbook. The data also confirmed that different learners value different features, nd that it would be prudent to translate useful features of the print handbook into he online version whenever possible.

A QUICK TOUR

A few screen shots offer a good idea of the design of this new e-book. *Writer's Help* ıses a three-panel design (Figure 1). Search is prominent at the top center of a window hat is always open. Content is displayed immediately below, with links embedded n the text. The left panel contains navigation options, with tabs allowing access to earch results, the index, or the table of contents. The right panel holds all social and ndividual customization tools: tagging, content highlighting and notation, settings, nd search frequencies. The left and right panels can be closed, leaving only the ontent panel in view.

To facilitate quick scanning, the content has been revised and chunked into smaller nits, keeping the explanations brief; focusing on examples; and avoiding extended, nbroken text. We made section and subsection headings as helpful as possible and reated many new headings to ensure that important advice is easier to find. To create a luid user experience and take advantage of the online environment, we incorporated inking on every content page—to other sections, to charts and checklists, to docu- ıentation models, to model documents, and to exercises. To facilitate navigation, we ıcorporated one or more links off every panel. Models, exercises, and related-topics

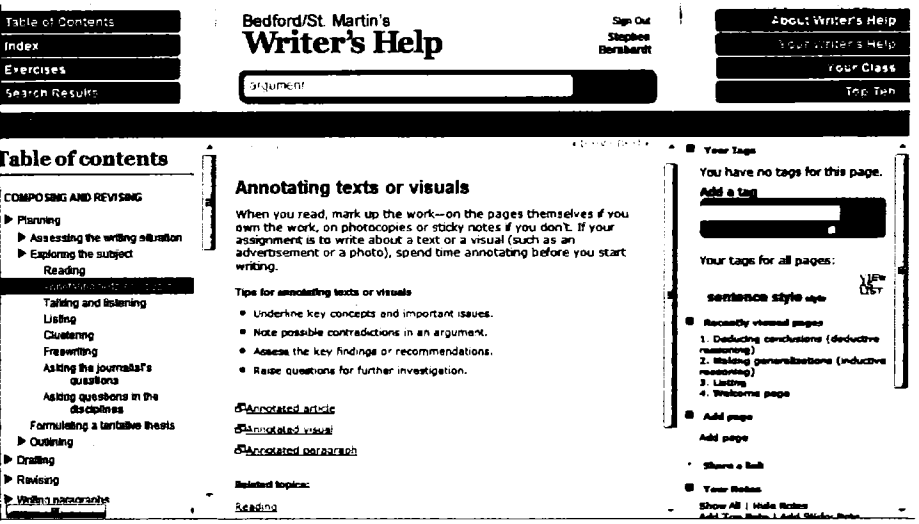

Figure 1. Three-panel layout.

links appear on many panels, typically in a segmented area at the bottom of the content panel (Figure 2).

We know that students frequently seek handbook help with citation styles, and so we paid particular attention to rethinking the sections that describe MLA, Chicago, and APA styles. Most handbooks separate attention to in-text citation from end-of-text citation—both topics need to be discussed and exemplified. In this case, we realized we were not restricted by space and printing issues, so we could offer both in-text and end-of-text examples together wherever it would be helpful to see both in one place. Our thinking is that seeing both in one place will allow students to compare the information and see the in-text and end-of-text citations as working in complementary fashion.

Throughout the book, but especially in citation styles, we privileged examples over explanations. If students can identify the appropriate target and follow the example, the handbook has done its job. Some students will want to see an annotated example, calling out the parts, so we provided those as pop-ups that persist until the student closes the example. Students can position the pop-ups on their desktop so they can examine the example alongside their word processing window with their text (Figure 3). Frequently, further explanations or pop-ups can be called with a

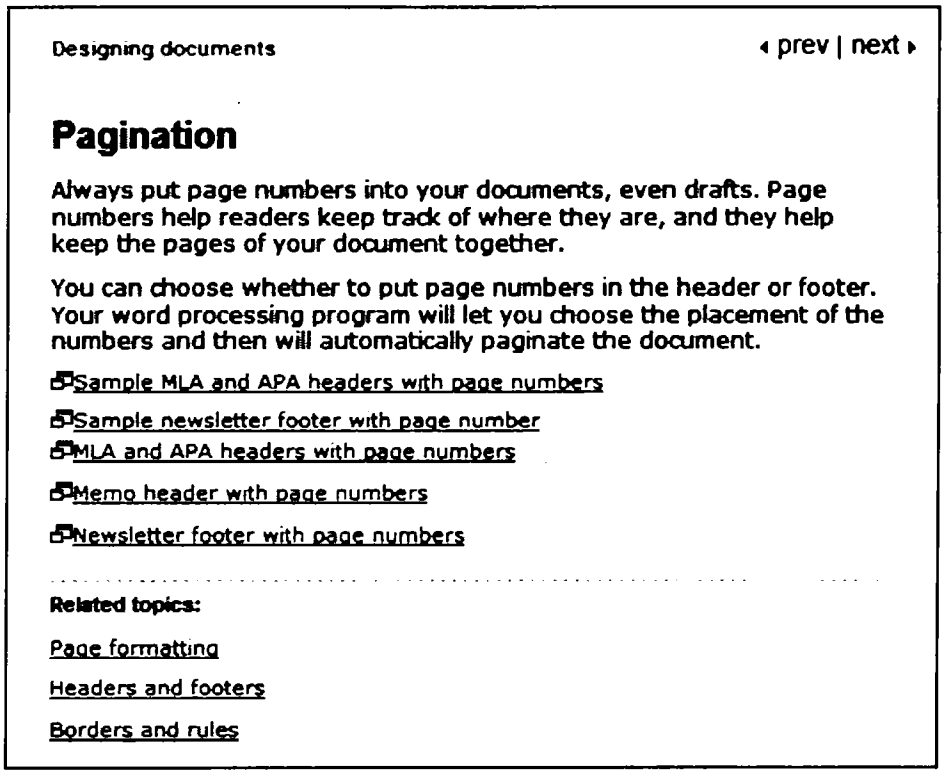

Figure 2. Content panel with links.

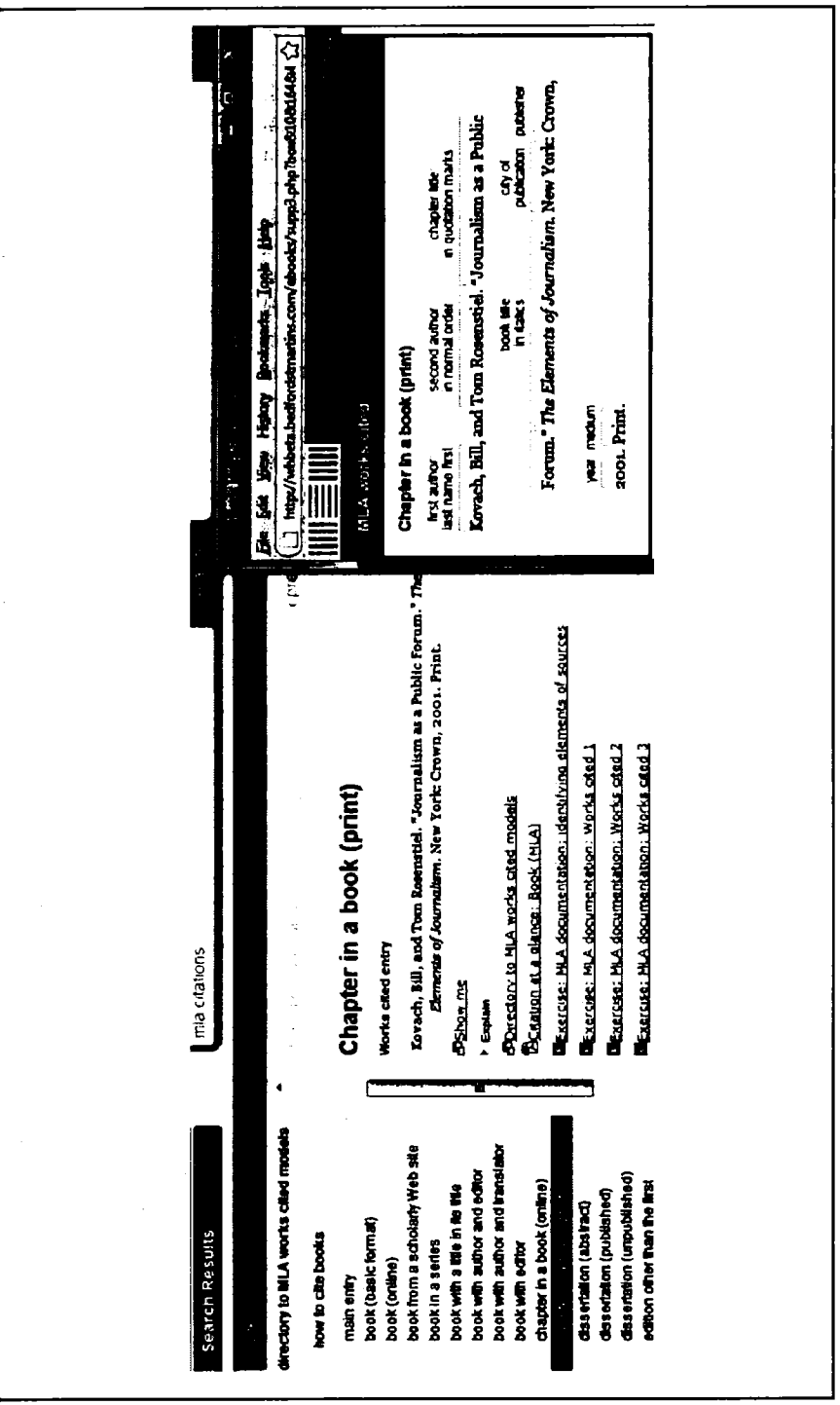

Figure 3. Citation model with pop-up.

click (Explain or Show Me), but they are one layer down so as not to clutter the clean examples.

We have worked to make it easy to get in and out quickly. A feature we call Quick Help (Figure 4) serves as a top panel to organize more detailed content a layer below. Quick Help focuses on examples, and sometimes a brief generalization, with links to more detailed content panels. We hope students will often be able to quickly find the help they need and get back to their writing.

User testing and feedback have been essential to designing these panels, and incremental refinement of the display conventions has led us to an increasingly simple, uncluttered, minimalist presentation. Throughout development, we have focused on building a resource that resides alongside the primary workspace, the student text under construction. *Writer's Help* is work support—a tool that rests on the desktop until needed, that comes up quickly, and that just as quickly gets out of the way when no longer needed.

BUILDING STUDENT LANGUAGE INTO SEARCH

One development goal has been to build a tolerant search engine so that students can use vague or imprecise language and still have successful searches. We know that students frequently do not know the formal terms involving grammar or citation

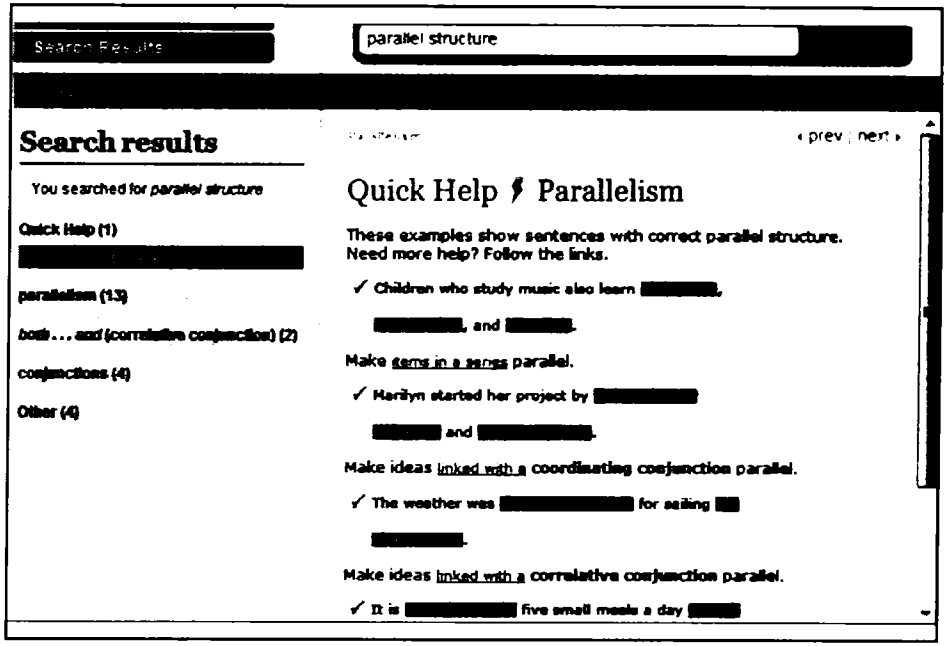

Figure 4. Quick Help on parallelism. A number following targets indicates that the category can be expanded to show x number of subtopics.

practices. We also suspect that search will be the predominant approach to looking for information in *Writer's Help* (as opposed to indexes or tables of contents or other listing structures). Thus, throughout development, we have focused extensive energy on creating a responsive, student-centered search engine.

From open-ended items on our student surveys, we were able to harvest a rich list of student terms. We have been using this term list, augmented by subsequent user data, to develop and tune our search engine. After reducing the redundancy, we had a core list of over 170 words or phrases that students are likely to use as they pursue questions or topics in a grammar reference. Some of the queries are quite specific and well-formed:

- supporting my opinion with evidence
- writing for a specific audience
- whether to use a colon or semicolon
- overusage of pronouns like *I* and *we*
- finding sources
- formatting a business letter
- sentence faults

When talking about writing, students frequently use common words and phrases rather than the carefully defined terms of a grammar handbook:

- choppy, smooth flow, using only words that have to be there
- getting unstuck, introduction starters
- writing my educated opinion in a more formal tone
- sticking to ideas, making sense
- punctuation following sentences
- how to stay in third person
- formatting my writing style to fit the professor's instructions

Such phrases need some interpretation or special handling by the search engine to direct the query. For example, *writing ideas* needs to point to something like *topics* or *tentative thesis statements* or *idea generation*. The phrase *getting unstuck* needs to point to entries on *writer's block, free writing, drafting strategies, prewriting,* or *invention.*

The open-ended questions also gave us some insight into how inventive students are with spelling. Misspellings of *punctuation* included these forms: puction, puncation, punchuation, punctation, punction, punctuitions, punctutation, puncuation, puncutation, puntuation, puntuattion, punuation. Obviously, we would need a search engine that would be highly tolerant of variant spellings.

Our search engine, developed in partnership with Ken Haase of BeingMeta, uses a broad set of terms with established linguistic relationships to build what we call "a semantic cloud." The cloud includes our specialized handbook of index terms as well as the vocabulary that we've collected in our research about how students search for help with writing. When a user searches the handbook, the semantic cloud maps potential relationships between the search phrase and any index terms that target

relevant pages in the handbook. A *relatedness score* is computed by the search algorithm, based on overlap of terms, closeness in meaning, or co-occurrence frequency in natural language. This relatedness score then ranks the returns so the top returns in the list should be the closest match to the search phrase. The system is programmed to tolerate variant spellings (see Figure 5).

With an editorial interface, we are able to test and edit how a wide variety of search terms interact with the semantic cloud. When searches fail to generate expected results or produce irrelevant matches, we can edit the semantic relationships in the cloud to eliminate the undesired matches or to establish synonyms that apply to the world of writing. The process is a bit tricky at times. Consider a word like *topic*, which might refer to subject of a paper, the topic sentence of a paragraph, the topic/comment structure within or between sentences, or the rhetorical term denoting the common places of argument. *Style* is another term with a daunting range of definitions and contexts in the discourse of writing.

Our approach has been *index-centric*: we built out the original book index of *Writer's Reference* to be much more inclusive of topics and variants, attempting to include all words that might arise in a writing classroom. To ensure relevant search results for writing-relevant content that is not represented in the print counterpart, we created

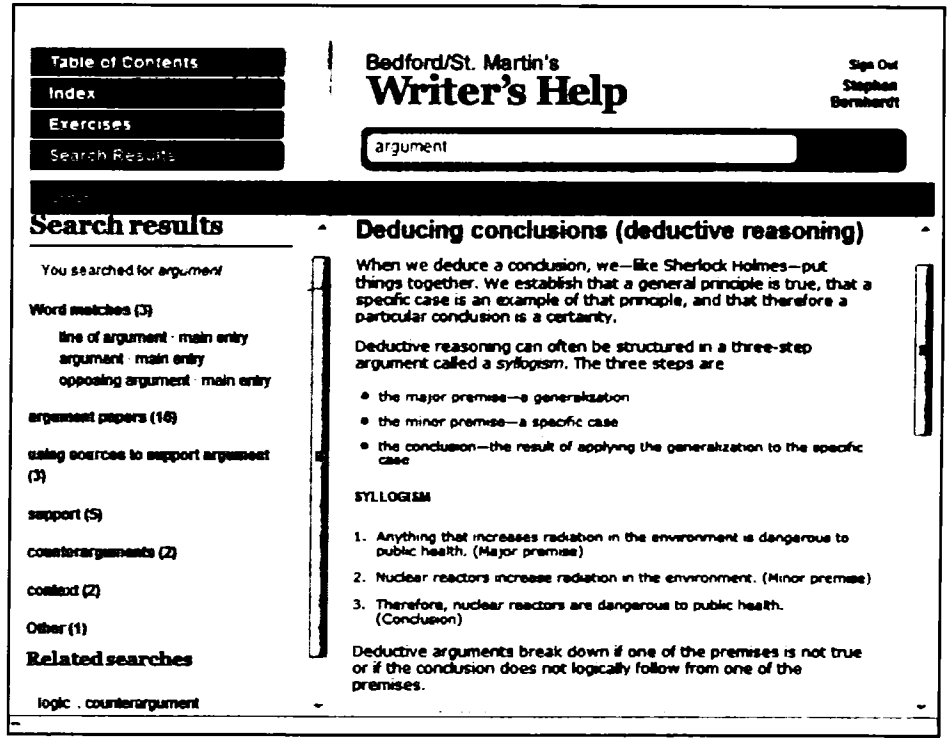

Figure 5. A fairly complex set of search returns on *argument*.

n expansive glossary of definitions and examples so that, at a minimum, a student ets some useful information from any writing-related term.

As the product develops in use, we will be able to monitor searches, with the goal f providing manageable lists of well-targeted returns for an increasingly high per- entage of student queries. Tuning search is an ongoing task. We know search is ritical to the success students have in finding what they want, even if their ability o name what they want is dicey. We have the advantage of working in a small world f potential terms—the language of a writing classroom—so we are not in Google pace. Nonetheless, the Goldilocks conundrum still represents a challenge: not too nany returns, not too few returns, but just right.

It is reassuring to know we can refine, redefine, prune, associate, and adjust search eturns. Our search analytics provide a stream of data that allows us to tune the andbook to student ways of working. Figure 6, for example, shows a current history f searches and tags (for all searches by all users), a dynamic item called up on the ight panel, visible to users.

As students use *Writer's Help*, we will know the most frequent, the most unusual, r the failed queries. We will be able to determine whether search provides too many r too few returns and make adjustments accordingly. A Web-based, centrally served eference work offers the potential to tailor a product to the particular ways that tudents and teachers work while writing. We hope that server data will allow us to reate a handbook that is truly responsive to student ways of working. Having user ata at hand should permit us to improve the resource in ways that have never been ossible with print books.

FACILITATING CUSTOMIZATION AND INTERACTIVITY

To use a handbook successfully, students need to interact with the text. In our eaching, we encourage students to be active readers through annotating a text, posing uestions in the margin, and bookmarking important pages. Part of the problem that as limited adoption of e-books to this point has been the lack of tools for doing vhat active readers do. With *Writer's Help*, we saw the potential to use existing tools rom prior Bedford e-books and to add tools that would increase the value of the tool o students and teachers, through individualization and through social tools. Figure 7 hows the right-hand panel, where these tools appear.

Tools you might expect to see are the highlighting tools for marking passages of ext in grey or yellow and a tool for sticking notes to pages. The student can show all otes in a list with links to content. It is also easy to share a link to a page with someone lse. A scorecard tool will keep track of student performance on the various exercises hat are part of the handbook, reporting results to the student and/or the instructor.

One new tool we added allows students to add tags to pages. The tags associate elated pages under a common term. For example, a student-assigned tag "my grammar rrors" or "backing up my arguments" could link together any number of related pages. Students (and teachers) can build out tag sets that will help organize content around heir individual ways of thinking. Tags can be viewed as a list or as a cloud (showing

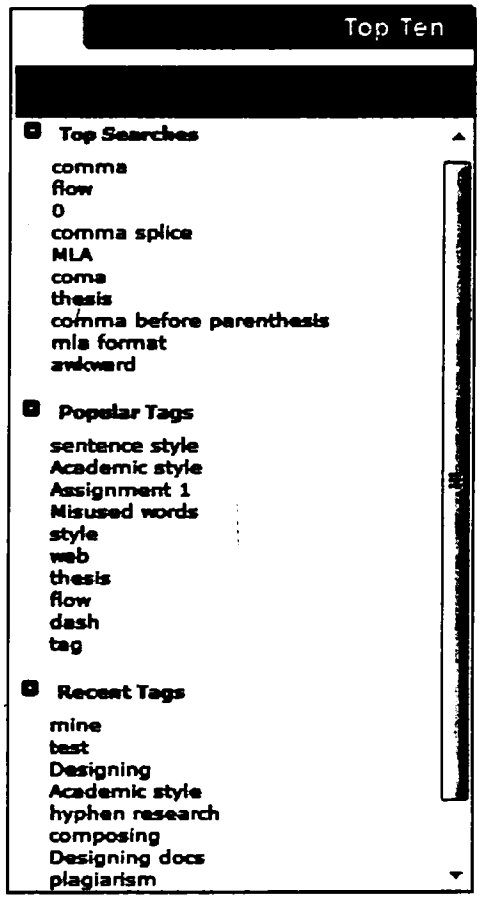

Figure 6. Searches and tags history.

graphically the ways the student organizes content in multiple tag sets). Tags can also be shared with the class, and a teacher can share a tag set with her students. Thus, if a teacher wants students to visit a series of topics in relation to a given assignment, she can create a tag set and share it with her students. Other tools allow the student to see recent searches, top searches, and popular and recent tags for the whole user community. All tags and lists have click-and-go links. Individual and class tags appear in search results.

Taken together, these individual and group tools should encourage a sense of ownership and control on the part of the student. Seeing popular tags or top searches displayed will cue students on content that they might benefit from examining. Seeing the terms should provoke learning the technical vocabulary of the writing classroom and trigger more productive searches. Adding notes or pages of new material should help students feel possessive about their individualized help systems.

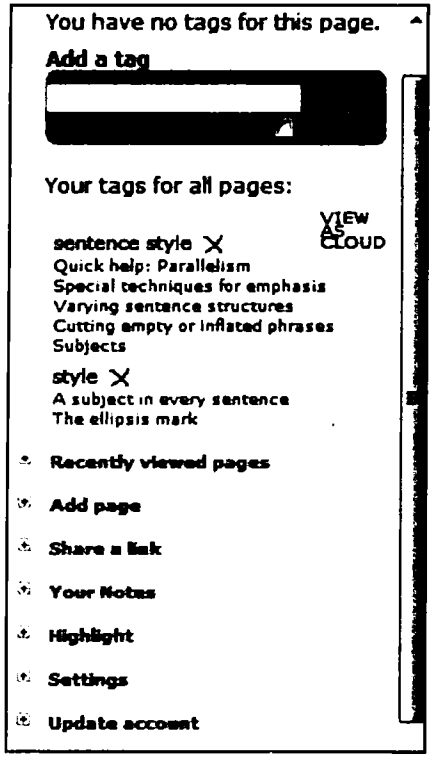

Figure 7. Tools for customization.

Many of our reviewers have indicated they want to be able to use *Writer's Help* in the classroom, which we believe is an important key to helping students become expert users. We have created various displays that work well if projected—the kinds of teaching objects that are useful from time to time (invention strategies, model documents, charts of grammatical categories, directories to citation styles). These objects appear within their own windows, which can be sized and moved. The class tools in the right panel also make it possible for the instructor to push content links to individuals or the full class, making it easy for students to link into assignment-relevant content. A teacher can "assign" a section of *Writer's Help* to the class by tagging a section of the table of contents. Any such teacher-created tags will automatically appear on the students' home page. We have also developed a guide to best practices, with suggestions for working in classrooms with an instructor media station, as well as in wireless classrooms or computer labs. Our goal is to encourage frequent shared use of the handbook, so students get better at knowing what content is valuable, how to find it, and how to return to previously viewed content.

BUILDING IN THE EXPERTISE OF FOCUS GROUPS, USABILITY TESTING, AND REVIEWERS

Part of building a tool that is responsive to users involves getting to know those users through participatory design. We wanted to tap into the expertise of those people who are close to the student experience. In important ways, teachers and writing program administrators drive the textbook selection process, so a new e-book needs to appeal to an intermediary—the instructor or program administrator or selection committee—in addition to the ultimate customer, the student.

Certain issues emerged as prominent among our reviewers, and we have attempted to address these issues during development.

- The product should follow students across their careers at school. It should not be limited to a single term, and the license should not expire, at least not at the end of term. Students should be able to use the *Writer's Help* in subsequent writing and disciplinary courses.
- The product should be developed to work across platforms, to be integrated into classroom-management software (such as Blackboard or Sakai), and to be site-licensed as well as individually licensed (writing center, writing program, department, university, library). Students don't work at one machine, so the product needs to follow them.
- The product must start up fast and provide fast returns. There should not be a complex log-in or cumbersome front-end experience.
- A strong, flexible search tool is critical. As the primary entry point, search should reflect the language of students and teachers and respond to queries that are not well-defined.
- Quick, targeted help is important. The product should find ways to allow students to quickly see examples and brief explanations that answer their questions and get them back to writing. There should be lots of clear examples that can be understood and applied.
- Grammar-heavy terminology and verbal denseness will be a liability. Search results or screens that look complicated or dense will be a barrier. The product should be designed to be highly visual.
- Frequent cautions were offered about overestimating the "always online" population. Not all students have good access to technology and connectivity. There were also many cautions about not overestimating the technological expertise of students. Many are not good at search or indexes or solving problems using online resources. Support for teachers and students to help learn to make best use of the product is critical.

Some opinions were mixed, suggesting the need for a product that would support different teaching styles. For example, some teachers want exercises or would assign sections to read; others expect students to use a handbook on an as-needed basis, primarily outside of class. Some respondents thought that social or interactive features would be valuable—that a user community could coalesce around those using *Writer's*

Help. Others thought it was a definite stretch to imagine anyone wanting to join a community of grammar handbook users. We are trying to accommodate the wide range of needs or desires as indicated by our reviewers. Because the work is electronic, it can be expansive. There is no particular reason to eliminate content just because relatively few teachers want it; in fact, it makes sense to keep it even for a limited subset of users. To the extent possible, we have developed the product to be responsive to such varying wishes.

The formal usability testing also turned out to be quite informative. *Writer's Help* scored well (> 77) on the System Usability Scale (SUS) Satisfaction Survey, which asks users to indicate overall satisfaction with a product. However, the usability testing also showed that some students needed quite a few clicks to get to information and that they were frequently unable to complete tasks successfully. The testing provided rich data on where students tended to go wrong and why they failed at the tasks. The improvement from round one to round two testing showed us that our interface and search were working better for students.

The usability test reports made specific suggestions to enhance the product: making some features work in more intuitive ways, improving search, changing the screen language, and reconsidering the hierarchy of the table of contents, among other suggestions. The testing also suggested that there is potential for creating a useful community of student users and recommended further development of the social tools that are part of the product. The overall conclusion was that *Writer's Help* has the potential to be a truly groundbreaking product.

These kinds of data from formal usability testing are valuable in several ways. They suggest that we need to make continued improvement in the interface design and search operations so student success is closer to 100% and so they are able to retrieve accurate information quickly with fewer clicks. Such testing also gives us a video and audio record of what goes on as students attempt to use the product, and every test generates surprises of one sort or another.

This kind of testing is relatively novel for a textbook. We know of similar testing by Tharon Howard in the usability lab at Clemson, the results of which he has reported in the *Journal of Usability Studies* (2008). His testing compared two print handbooks, using abbreviated, excerpted text, not the full books. Howard found that users failed in several ways: they frequently believed they had found the right answer to a question, but were, in fact, looking at information that did not match their defined problem (p. 198). The users in Howard's study also failed to recognize the complexity of their situations. They quickly alighted on the first example that looked right, or they scanned text and skipped the explanations that would allow a precise choice of alternatives (p. 199). Determining the precisely correct ways to structure a citation or punctuate complex clauses is tricky business. It might not surprise readers here to know that the student test subjects had such difficulties, since we see evidence in every class we teach, with whatever reference materials we use. It is important to remember too that our usability testing, as Howard's, was conducted with new users in a lab setting. Performance is likely to be much improved among experienced users.

Life Cycle Planning

Moving forward, we will be able to make continuous, incremental improvements to *Writer's Help*. Because the product is online and centrally served, we have an advantage that has not been available to textbook writers in the past. As the product is classroom tested, we will know how students use the product, what they search on, and where they visit frequently. We will have a feedback loop that will allow us to adjust the language, capture student terms, and generate productive searches. We will discover problems and be able to fix things on the server side so the user experience improves without any fuss on the user side. We'll get to know if students use the tools provided for customization and whether they are looking for new ones. We will have an easier time gathering instructor and student feedback since they will be online and able to send us notes on their experiences. We will be able to provide teachers with data on student use.

Having a product out and functioning will allow us to incorporate new content into Version 2.0. We have a list for enrichment of content, with increasing attention to electronic and visual rhetoric, more expansive treatment of genre and style, and more on the specialized discourses of various academic and workplace communities. Importantly, expansion will be based on the kinds of help that students are looking for and the kinds of added pages that teachers create.

We also anticipate further customization. For example, it might be useful if users could turn off or hide information that they never use, such as one or more of the documentation styles. If a student in chemistry (or a chemist in the lab) never uses MLA but relies on Council of Science Editors style, then adding a CSE module and suppressing all MLA, APA, and CMOS content from display and search would streamline presentation and not force the user to filter out irrelevant content. Similarly, users might choose to hide information on sentence fragments if they never make such errors.

We also anticipate enhancements to the social and interactive features. There is an interesting tension in the product between the book's function as an e-book reference tool versus a tool that facilitates interaction and social convergence in a writing class. It may turn out that teachers and students want more social tools, such as those found in classroom management systems (chat, whiteboard, discussion forums, blogs). Perhaps instructors would like some form of networking for their teaching concerns, materials, or strategies. Perhaps users will want more links to external resources on grammar, usage, or style. We might provide some sort of grammar hotline or blog. There is much to be said for a limited reference tool that is not overloaded with features. But there is also something attractive in imagining how *Writer's Help* might evolve as a *site* for classes and composing in addition to being a *help system* with information about writing.

Collaborating on Texts and Applications

In figuring out how to create this new product, it has been immensely helpful to have a team of people with different areas of expertise and different perspectives. From a personal viewpoint, I feel lucky to have become part of this project. The work has pulled together various elements of my teaching and research interests: writing,

rammar, and style; information design and usability; visual and electronic rhetoric; rofessional and technical communication. Most of the time, when we work on a roject, we focus on a particular area of understanding or expertise. We stop doing one hing to concentrate on another. But this project has called upon multiple areas of ong-term interest, representing present and past inquiry, and in many ways the project eels nicely culminating, confirming that the various directions my career has tracked ould actually converge in a single project.

Another point of confirmation has been the opportunity to get to look inside the orkings of a major, successful publishing house. When we write books, if we are ucky, we get to work with a good development editor and a good copy editor. When ll goes well, the process is collaborative and rewarding. But it doesn't always go ell. As department chair at the University of Delaware for 5 years, I witnessed eclining levels of support for faculty authors from university and trade academic resses. Many faculty were expected to prepare their own visuals or photographs to company their books, and they frequently had to pay per visual for the production ork. Many faculty had to do their own proofing, with very little editorial support, nd most had to create their own indexes or pay a professional indexer. One faculty ember, working on a collection of essays of literary criticism to be published by an cademic trade publisher, found that she was expected to prepare the full manuscript to e camera ready, including all page formatting, table of contents, index, and everything lse. There was no editorial support whatsoever at this academic publishing house. hat's a grim situation, the worst that I witnessed. As chair, I worked to find sources f funds for publishing subventions, sometimes paying for the costs associated with reparing a manuscript, but also sometimes paying for a portion of the print run for he publisher. These may all be signs of an academic publishing industry in decline.

My experience with *Writer's Help* has been just the opposite. Inside Bedford, I ound people with deep and informed interests in student writing, in the teaching of riting, and in information design. They embraced this project with gusto. They were ager to hear from students about how they write and work, and they maintained ontinual dialog with teachers and opinion leaders in our field. When we conducted ocus groups at CCCC, various people from Bedford (editors, sales, marketing) wanted o be part of the discussions, and we had to limit who could attend so that most of he people in the room were our targeted participants, not company-internal people ho were fascinated by the prospect of a new online handbook. The project called pon expertise at Bedford that cut across divisions, with people contributing from all irections. From the start, there was an atmosphere of excitement and enthusiasm, a eal interest in creating something special.

When the team ran up against the limits of their own expertise, Bedford was willing o go outside and hire consultants to help with interface and search function design. he team would critique new designs or test the search results, working on a very ollaborative model of group critique, where different approaches were heard, different pproaches tried out in prototype, and different prototypes tested with students and eachers. When the timeline for getting the product to market called for more internal esources, a new XML author was hired and other resources were devoted to the roject. I've been fortunate to work in similar situations in other work I have done,

particularly in new drug development. When a product is important to a company, and when the project is complex, it is a great experience to be a member of an interdisciplinary, cross-functional team, working to bring a new product to market.

Our shared challenge has been to understand what students and teachers want, how they work, and how an e-book might fit into their classrooms. The generous participation by students and teachers in the design process and the commitment of a talented team have led to a resource that reflects what our users want and how they work. We are optimistic about this new tool, *Writer's Help*.

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