

Are chemistry instructors and students ready for an Internet-based chemistry text?

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Abstract

With computers, relatively inexpensive software, the Internet, and print on demand printing, it seems that anyone can now consider writing and self-publishing their own internet-based textbook. This paper addresses the issues related to this task. The following questions are presented, possible answers are suggested, and requests are made for answers from CONFICHEM participants. Is it possible for one person or a small group of people to create a quality chemistry text and supplemental materials without the support of the established academic publishing industry? Can chemical educators be convinced that a text that is not distributed by a known publishing house can be of high enough quality to consider adopting for their classes? If there is some resistance to new approaches to delivering information, what factors might counter-balance the concerns? What's the best way for self-published material to be reviewed? Are students ready to get more information from computer-based sources? What percentage of students would want a hard copy of an internet-based text? Would they be content with a black-and-white version, assuming that they have access to the color version on the Internet? How will authors be compensated for their work? What's the best way to advertise self-published material?

See http://preparatorychemistry.com/Bishop_conference.htm.

Introduction

I've launched an Internet-based version of my preparatory chemistry textbook, *An Introduction to Chemistry*, first published by Benjamin Cummings in 2002. I am, of course, extremely curious as to whether a web-based text will be well received by chemical educators. While I will use my text as an example, I will try to concentrate on broader questions in hopes of stimulating some active discussion. If you want more information about my Internet text and tools, the link below will take you on a tour.

http://preparatorychemistry.com/Bishop_tour.htm

Although my text was first published by Benjamin Cummings, the Internet version is self-published, so the questions that I am presenting for discussion relate to both Internet-based textbooks and possibilities that the Internet and new printing methods provide for self-publishing.

Is it possible for one person or a small group of people to create a quality chemistry text and supplemental materials without the support of the publishing industry?

Can chemical educators be convinced that a text that is not distributed by a known publishing house can be of high enough quality to consider adopting for their classes?

If there is some resistance to new approaches to delivering information, what factors might counter-balance these concerns...price?...flexibility?

What's the best way for self-published material to be reviewed?

Are students ready to get more information from computer-based sources? What percentage of students have computers at home? How many have the fast Internet connection necessary to easily access modern web tools? Are students comfortable using computers at school or in libraries?

What percentage of students would want a hard copy of an Internet-based text? Would they be content with a black-and-white version, assuming that they have access to the color version on the Internet?

How will authors be compensated for their work?

What's the best way to advertise self-published material?

Can it be done?

There are a lot of tools available that make it fairly easy (though hugely time consuming) to create Internet-based materials. For example, I created all the illustrations in my text using Adobe Illustrator. I took many of the text photographs myself with a digital camera and improved them using Adobe Photoshop. Many of the other photos came from royalty-free Internet sources where the photos are very inexpensive. I found a few additional photographs on the Internet, and people were kind enough to give me permission to use them. I did the text layout and Acrobat file creation using Adobe InDesign. I created the animations, tutorials, and glossary quizzes using Macromedia's Director. There's PowerPoint for presentations, as well as various programs, such as FrontPage and Dreamweaver, for website creation.

You can see my text and its supporting tools at

<http://preparatorychemistry.com/>

The table of contents, periodic table, text chapters, student study guide chapters, appendices, answers to selected problems, and the complete glossary/index can be viewed as Acrobat files. All of these files are of the same quality that you would expect from any modern text, including photographs, illustrations, and a professional layout. The website also includes Shockwave animations, tutorials, checklists for each chapter, PowerPoint presentations, chapter maps, glossary quizzes, and Chime structures.

Are instructors ready?

This conference may help answer that question. I'm guessing that many people will think an internet-based text is a good idea, but, at least in the beginning, few will actually adopt such a text. I'm hoping to be surprised. What do you think?

What's the carrot?

I'm planning several approaches to encourage instructors to take the plunge into new territory. First, I'm trying to keep the cost low. There are four ways that students can gain access to the text.

Students who have easy access to the Internet and who feel comfortable viewing the text on the computer are asked to pay \$20 for that privilege.

If \$20 creates a significant financial hardship, I'm happy to provide the Internet version of my text and tools for free.

Students with slow Internet connections can purchase a CD for \$29.95 that contains all of the website files.

Students who want a hard copy of the text can purchase a black-and-white version from me for \$39.95. The printed text can be purchased through college bookstores at a cost of \$59.95. The study guide with selected answers to text problems that accompanies the text is \$29.95 directly from me and \$49.95 from a bookstore.

Second, it is possible for someone who is self-publishing to offer more flexibility. It is common for instructors to like the features of a text but not necessarily the order in which information is presented. Ideally, different versions of the text would be available with different orders of topics, and instructors could pick the version that best fits their approach to the course. The publishing houses see this as a logistical nightmare, but if authors are comfortable doing the layout of their texts themselves, it is relatively easy to make this happen. For example, programs such as Quark and InDesign allow one to rearrange the order of chapters, eliminate chapters, change the table of contents, adjust the index, and renumber figures, tables, exercises, and examples without spending a huge amount of time. I have created two versions of my text (a chemistry-first version and an early-unit-conversions version), and I plan to make two more (an early-chemical-calculations version and an atoms-first version).

For the printed version of my text, I also plan to provide the option of omitting chapters that an instructor chooses not to cover. The instructor could choose from among several base versions of the text and also choose not to have later, less important, chapters included. The goal is to provide texts that are as closely tailored to each instructor's course as possible. I can even include material created by the instructor.

Changes and corrections to a web-based text can be made very quickly, especially when the author is also the webmaster (which is fairly easy to do with programs such as FrontPage or Dreamweaver). My experience with a large publishing house taught me that because it is a large bureaucratic organization, it often takes what seems like forever to get anything done, including a simple correction on a website.

Are there other factors that you think would encourage instructors to adopt an Internet-based text?

Reviewers?

Every author needs feedback, and it's important that this feedback come throughout the writing process. I had Benjamin Cummings to find and pay for over 70 reviewers and two saintly developmental editors, so I got constant feedback and suggestions. It's not so easy for someone self-publishing from the beginning. Although there are people, such as those who are active contributors to listservs, who are willing to share their ideas for free, I feel that if reviewers are asked to look closely at portions of a text, they should be compensated somehow.

Do you suppose that the American Chemical Society or some other organization might contribute in some way? Do you have any other ideas?

Are students ready?

My experience tells me that students are not only ready but anxious to use computer-based learning tools. The key issue is how much we can rely on computers and the Internet. Computers are so important to what I do that I have to remind myself that not everyone has a \$1000+ computer sitting on their desk with a fast Internet connection. Despite this, my own experience suggests that it has become reasonable to expect students to have Internet access either at home or at school. I haven't polled my students recently, but I think that a very high percentage of my students have easy computer access. I run my courses assuming it's true, and my students have not mentioned that this is a problem.

What do you think?

A hard copy too?

I have some seriously geeky tendencies, but when I'm learning something new, even a new computer program, I sit down with a book and my highlighter to read. Although the younger generation is more comfortable reading text on the computer screen, I suspect that most of the students who read their texts carefully will want a hard copy. Acrobat files print well, but it's time-consuming and costly to print an 800-page text on a home

printer. For this reason, I am offering a printed copy of my text. It will be interesting to see how many students buy it.

There's no doubt in my mind that color images are better than black-and-white. Some of my Illustrator-created images are hard to decipher in black-and-white. The problem is that color printing like that done by the publishers requires a large up-front expense that is beyond the budget of most school teachers. For now, this restricts the printing of self-published books to black-and-white. I don't think this is a huge problem. Although color is more appealing, the basic information, examples, study sheets, problems, and other components of the text are efficiently presented in black-and-white. Access to the Internet version of a text will allow images to be viewed in full color.

How do you think students will react to this?

Compensation?

To create quality textbook and supplemental materials takes a huge amount of time, and the creators should be compensated. I'm hoping to be compensated in two ways, through payments for use of the website and through the sale of hard copies. I'm curious as to whether others expect my approach to work.

Do you agree that some form of compensation is necessary to encourage people to spend the time it takes to create quality work? Are there other ideas for compensation?

How do we let people know that our work is available?

The Internet and email make advertising a self-published work easier and cheaper. Some options are free, such as contacting chemistry instructors through email. I'm a little uneasy about this, because I don't want to be seen as adding to the flood of spam. I'm interested in collecting opinions about how periodic email messages are likely to be received.

This online conference is an example of another great way to let people know that new work is available. Also, with some expense, an author can attend chemistry conferences around the country.

What else can be done?

et cetera?

What other issues related to the self-publishing of an Internet-based chemistry text occur to you? I'll be glad to respond to any questions that you have about my

experience in this new realm, and I would greatly appreciate any comments or suggestions about what I've done.

If you want to know more about the text, you can select one of the following links:

http://preparatorychemistry.com/Bishop_Preface.pdf

http://preparatorychemistry.com/Bishop_Preface_moved_8.pdf

http://preparatorychemistry.com/Bishop_Chemistry_Strengths.htm

Thanks for the opportunity to share information about my work.