"Why Does Google Scholar Sometimes Ask for Money?" Leveraging the Economics of Information and Scholarly Communication Processes to Enrich Instruction

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Introduction

A significant challenge in information literacy instruction is helping students understand how searching library subscription-based resources both relates to and complements using the search tools they know best – Google, Yahoo, and Wikipedia. In an information landscape where the distinctions that formerly separated the "free" and "subscription-based" Web become increasingly blurred through tools such as Google Scholar and Google Books, this challenge is becoming ever more heightened and critical for lifelong learning. These resources and the technologies that shape them cannot simply be distinguished by emphasizing dichotomies such as peer reviewed/non-reviewed or quality resources/suspect resources. Rather, the salient distinction is one shaped by access and who has the rights to information, issues shaped by economics. As a result, it is becoming increasingly important to help students understand how information "works" – who creates it, how it gets vetted, and its distribution channels. In an effort to tackle this challenge, librarians at North Carolina State University have created strategies for teaching students about the scholarly communication process and the underlying economics of information in order to contextualize how library resources relate to information found through the free Web (i.e., Google, Yahoo).

Although the ACRL Information Literacy Competency Standards do focus, in Standard Five, on aspects of the "economics, legal, and social issues surrounding the use of information,"[1] these topics are often left out of library instruction. Information literacy instruction as provided by librarians typically focuses on the *finding* and *evaluating* skills with less time given to the contextualizing competencies described by Standard Five. This lack of economic and social contextualization is a consequence of the fact that, for librarians, information literacy is frequently thought of primarily as a means to ensure students receive instruction on how to use significant library tools such as the catalog and abstract and indexing databases, evaluate websites, and judge the quality of the information they find. The end goal is typically to find high quality publications to complete an assignment. As a result, information literacy instruction too often tends towards the procedural as it is very task-oriented in nature and usually severely constrained by a shortage of instruction time.

The authors decided that providing students with greater context for finding and using information is *essential* for developing critical thinking skills and lifelong learning. As a result, we have spent the past four years creating instructional strategies to teach students about the scholarly communication process and the economics of information. Although we use a specific writing and communication course taken primarily by junior- and senior- level science majors as the sandbox for creating our instructional strategies, aspects of this contextualizing instruction can be incorporated into a variety of instructional and disciplinary contexts. Other instructional groups we have routinely worked with include engineering, communication, and English as a Second Language undergraduates, as well graduate students in disciplines as diverse as textiles management, computer science, electrical engineering, textiles engineering, education, and communications and rhetoric in digital media. If instruction time is limited and an instructor wants to focus on how-to-search strategies, contextual instruction can be as simple and limited as telling students what the database they are using costs or what a leading disciplinary journal used as a classroom example costs. Additionally, it takes little time to use the metaphor of the "Invisible" or "Deep" Web to highlight

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the distinction between the "free" and "costs money" aspects of the Web. Either way, the goal of such a brief foray is to help students understand that this content is not only in the library's collections because it is scholarly, but because it costs money and is otherwise unavailable. There is a *why* attached to using library tools, not just a *how*.

Our Instructional Strategies

Engage students in a dialogue about scholarly communication.

Students vary widely in what they understand about how researchers communicate, peer review, and how scholarly information is disseminated. But it is safe to say that few faculty members go much beyond telling students via syllabi to find peer-reviewed articles. No mention is made that journals for the most part cost money and hence are mostly limited to libraries in terms of access. No mention is made that many of them are not indexed, at least in any truly comprehensive way, by Google and Google Scholar. No mention is made that peer review does not guarantee publication of an article and that peer reviewed journals exist as much for career management as for professional communication. Librarians, however, can step in to fill in the gaps and help students think about why journals exist at all and then what sorts of costs, discovery tools, and access limitations have grown up around them.

Teach students how scholarly information is a business.

Journals cost money. That fact, however, is almost never mentioned to students. We suggest that revealing this reality has positive classroom use. It enables librarians to help students realize that the library procures expensive journals that they could never hope to afford on their own. Frankly discussing the money surrounding information also helps students make sense of the messages they frequently see to purchase articles when using Google Scholar.

From questioning students over the years, it is clear that they vastly underestimate the prices of science, technology, and medical journals, and often think the online versions are entirely free. As a result, we decided to incorporate these cost estimates into lessons in order to drive home the realization that journals are commodities and get at why articles cost so much when discovered through Google Scholar. Our strategy consists of playing a "Price is Right" type game in which students make guesses on the value of the journal the instructor(s) are selling to the library; *Brain Research* and other expensive journals are commonly used. Students at this point often ask interesting questions about who gets access (the entire campus, for how long, print, online, or both, etc.). They are generally stunned at the real prices paid for *Brain Research*.

A second activity involves showing students a long list of titles that the NCSU Libraries subscribes to along with the prices and the usage data. Students get to see the great variation in price among different disciplines, but also see that many journals cost at least four figures and some five figures. None are priced at what they consider a "normal" magazine level. After looking at some of the prices, we explore data for the amount of annual use for given journals and the per cost use.

A third activity that can be incorporated in addition to or in lieu of those already mentioned is showing websites that highlight "sticker shock." The Vanderbilt University,[2] Cornell University,[3] and the University of California San Francisco[4] libraries all have effective and interesting websites that compare journal costs to items students would love to have (i.e., a new Volkswagen Beetle, plasma screen televisions, a diamond ring, trips to Europe, etc). Seeing a yearly journal compared to a new car clearly brings home the message that real money is involved in getting journals for student use and that if journals cost that much money, it is quite unlikely that students will be able to get the contents of such expensive commodities for free via Google or Google Scholar.

Articles as monopolies, Journals as scarce commodities

After students receive the "sticker shock" we pose two questions to them: "How can publishers charge that much?" and "Why are libraries willing to pay that much?" These questions help students realize that publishers can charge their prices because journals are viewed as absolutely intrinsic to academic work; there simply is no substitute. With some classes we take this further and discuss how journals are competing brands (showing them several organic chemistry journals from different publishers) and that no library can afford to buy every available journal. We also discuss how journals are "scarce commodities" in that each article is unique and un-replicable so every issue is a highly unique item.

Expose students to how Google and Google Scholar work and how economics shapes what these tools can reach.

Using diagrams focused on the metaphor of the Deep or Invisible Web, we explore how search engines work, the "silo" nature of the Web (i.e., numerous discrete databases), and explicitly break the Web down into "free" vs. "costs money." We look at consumer behavior and how some websites used by consumers such as the Apple Store, iTunes, Expedia, etc. are free to search but the products cost money. The salient point in these comparisons is that students are already familiar with searching specialized silos of information (eBay, Amazon, Travelocity, etc.) and for paying for products in order to have access (e.g., the plane ticket, mp3, or book). This free discovery/paid access model is contrasted with the paid discovery/paid access model of most library databases.

Building on the Deep or Invisible Web metaphor, we further explore how Google, through partnerships with publishers, is blending the "free" and Invisible Web. This again points to the need to understand the difference between

discovery and access. Google Scholar is always a discovery tool. Sometimes it can act as an access tool as well if a publicly accessible version of an article is discovered, but if an article is not archived openly, then Google Scholar loses any ability it has to give access.

Help students distinguish between discovering information and accessing it.

As has been seen, we make a strong distinction between *discovery* and *access*. You can *discover/find* that something you want exists – a journal article in Google Scholar, an iPod on eBay, a plane ticket on Travelocity – but this discovery does not guarantee that you can *access/get it*. You must *pay* for it first. This distinction is crucial for helping students understand why they find messages to purchases articles in Google Scholar and/or why database records do not represent library holdings. If there is one message that we hope these lessons impart, it is that discovery does not guarantee immediate online access and that the reasons why are almost entirely economic. If students can understand that article and indexing databases are mostly proof of publication, but not proof of ownership, they can make more sense of the OpenURL resolvers that many libraries have implemented to connect discovery and access back together in a more seamless fashion.

Balance teaching contexts surrounding information with hands-on experiential learning.

Instruction that exposes the economics surrounding scholarly communication and its impact on the technologies used to find information is a natural segue into showing students how to use databases, the library catalog, and Google Scholar effectively. As mentioned earlier, too often library instruction leaves out the contextual while dealing entirely with the procedural. However, for truly effective hand-on experiential learning to take place, students need to be able to transfer the theory of information economics back to the task at hand – actually finding journal articles. Thus classroom sessions always have hands-on searching time where students can begin to apply what has just been discussed and see how the principles invoked hold true across any interface or publisher.

Assessment

As an experiment, the authors designed a pre-session "knowledge probe"[5] (PSKP) that focused specifically on scholarly publishing and the Web in order to understand students' existing mental models related to these topics. A series of questions were asked that had correct answers and/or required broader contextual knowledge to answer correctly. Results from the PSKPs suggest that students have very confused and limited understanding of scholarly communication and a muddled understanding of the distinction between discovery and access and what role economics plays in either topic. Although it was difficult to draw definite conclusions from this data, the results did suggest that students would benefit from instruction related to scholarly communication and the economics of information.

Additionally, the authors routinely use in-depth post-session surveys to assess student engagement with the instructional content and to gather feedback for iterative tweaking of the instructional strategies. These surveys have demonstrated that both the economics of journal costs and how Google Scholar actually works are new to many students. Students also mention they find it very useful when they realize that because journals and databases cost money the implication is that they generally can only be accessed through the library.

Quizzes are routinely given to students to gauge student learning. Open-ended questions allow students to reveal in their own words their understanding of how scholarly communication works, the distinctions between article databases and Google Scholar, and how the economics of information affects research. Several quiz questions focus on applying information learned in the workshop to new research scenarios such as researchers not affiliated with a university or scientists in a developing country. Student answers to these questions show that they can transfer this instruction to new contexts, an important aspect of lifelong learning.

More in-depth assessment is clearly needed to ascertain which instruction topics are most core, both from the stance of being necessary to the contextual nature of the instruction and from the stance of yielding the most change in students' conceptual views. A need also exists to determine if there is an order to presenting the topics that is most beneficial and to see how the lessons can best be clustered and presented singly or in groups.

Finally, the best measure of success is feedback from students themselves. We knew we were on to something based on the comments we kept getting at the end of the sessions. Students told us they appreciated being taught rather than trained. We routinely receive feedback such as the following:

"I thought the most interesting parts of the forum last night were the statistics. For example, I knew that the university spent tons of money of journal subscriptions, but I didn't know high it was! The same goes for the number of journals out there, I knew there are a lot but 10,000 was it? That's amazing!"

"I learned the reason Google fails me so often...I wish this presentation was offered earlier in my college career."

"Being a college student = access to a lot of expensive material."

"Best library presentation I've been to."

Conclusion

Teaching students about economics of scholarly publishing enables them to see that valuable information blending the "free" and Invisible Web. This again points to the need to understand the frequently comes at a price, the role libraries play as gateways to information, and how the exchange of money affects the technologies that provide access to information on both the restricted (i.e., subscription-based) and free Web. Although many instruction sessions do not offer an opening to a full discussion of the economics surrounding scholarly information, aspects of this instruction can be folded into almost any teaching opportunity as a way to contextualize why we still need libraries and library subscription resources in the era of Google.

(Endnotes)

1 Association of College and Research Libraries (2000) I*nformation Literacy Competency Standards for Higher Education*. Retrieved April 23, 2008 from http://www.ala.org/ala/acrl/ acrlstandards/ informationliteracycompetency.cfm

2 http://www.library.vanderbilt.edu/jcosts

3 http://astech.library.cornell.edu/ast/engr/about/ StickerShock2.cfm

4 http://www.library.ucsf.edu/research/scholcomm/ stickershock.html

5 Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques: A handbook for college teachers.* San Francisco: Jossey-Bass.