Developing Search Strategy Guides for Teaching Pharmacy Students How to Find Full-Text Journal Articles

Robert H. Schrimsher, MLIS, EdD, Associate Professor of Pharmacy Practice and Pharmacy Librarian. McWhorter School of Pharmacy, Samford University, Birmingham, AL.

Abstract
In an academic setting, knowing how to find full-text articles, especially articles within an electronic database, can be exasperating. Simple strategies can be developed in accordance with resources available that will greatly assist students toward finding full-text articles. These search strategies are not designed to teach how to search various full-text databases, but merely points the student in an systematic order to those resources (both print and electronic) that are available. Designing full-text guides involves combing 3 factors: identification of available resources; where they are physically or electronically located; and illustrating the ease of accessibility. The order of these three will vary among institutions. The task is to evaluate these 3 factors and design a straightforward guide so students can easily locate full-text articles. Using such strategy guides reinforces the lifelong learning process. Due to the nature of the profession, current information regarding drugs and diseases will always be a necessity.

Introduction

Finding a full-text journal article, especially an electronic journal, is often a very frustrating experience for the pharmacy student. The need may arise from a class assignment or the student's individual research endeavors. Often, pharmacy students do not know how to begin the process of finding full-text journal articles, even if they have the bibliographic citation for the article. Citations with abstracts normally do not provide enough information to make a definitive decision regarding the efficacy of a drug, treatment interventions, dosing regiments, etc; therefore, the full-text article is necessary in most cases.

It is the author's opinion that in the future, assignments to review primary literature will become more prevalent in pharmacy education. First, there appears to be a viable notion that pharmacy education should consider adopting the principles of evidence-based medicine (EBM).[1] EBM is predominantly contained in the primary literature. Second, pharmacy students soon discover that to understand the full scope of drug treatment, both the drug and the disease must be considered; thus, basic medical journals that report on clinical trials, disease reviews, new drug indication studies, etc., must be available and easily accessible. Third, because of its nature, pharmacy education is considered to be a "lifelong learning" process; therefore, finding, acquiring and searching for primary literature is something the pharmacy student and the pharmacist will be doing throughout their pharmacy career. For this reason alone, learning very early in the pharmacy curriculum a structured strategy for obtaining full-text articles would be beneficial, if not essential.

The purpose of this brief article is to offer suggestions to schools of pharmacy in order that they might effectively develop their own strategies toward assisting students for finding full-text journal articles.

Published in:
The International Journal of Pharmacy Education
Summer 2004, Issue 1

Role of the Pharmacy School

The role of the pharmacy school for developing search strategies to teach their students how to find full-text journal articles is critical. This is largely due to the 3 reasons mentioned above, but primarily because developing these full-text search strategies is a learning process in and of itself. The same principle is applicable to learning how to search databases such as PubMed (Medline) or the Iowa Drug Information System (IDIS). These learned strategies are required throughout the pharmacy curriculum and likely, throughout one's professional career. Development of guidelines for full-text search strategies is no different than developing guidelines for searching PubMed or other databases. These guidelines are particularly useful for drug information courses and clinical rotations. When developed, guidelines can be used by all personnel, not just students. Faculty members need to be very cognizant of journals available (and not available) in full-text. How many times does it happened that a faculty member assigns an article for to review that was not available as a full-text via any means for the student? This normally happens when the faculty member simply is not aware of what is available.

Developing Guides for Full-Text Journal Articles

The drug information faculty are most likely the best suited to develop strategy guides for finding full-text journal articles and should collaborate with the school/university health librarians to identify all available medical resources. This aspect will be discussed in more detail later. It is highly recommended that the guides be developed in a Web-based format, that is, that they be placed on the Internet. There are several reasons for this, but primarily because the Internet is generally accessible by all students; and second, because Web-based items are easy to edit. An example of a Web-based format is the McWhorter School of Pharmacy, Samford University, Guide for Finding Full-Text Journal Articles (URL: http://www.samford.edu/schools/ pharmacy/ dic/fulltxt.htm).[2] In this particular format, the pharmacy student (or user) simply follows the litany order, beginning with the easier strategies and working through to the more time consuming. The guides developed at the McWhorter School of Pharmacy for finding full-text journal articles are not designed to teach the student how to search databases, but merely point the student to those resources (both print and electronic) that are available in a systematic order.

One of the biggest advantages for designing full-text guides is to distinguish the from nonfull-text databases. Nonfull-text databases are those that render only a bibliographic citation and normally an accompanying abstract. A good example of a nonfull-text database is PubMed; however, occasionally, it does link to free full-text articles, but it is generally considered a nonfull-text database. Full-text databases are usually procured via the school library or sometimes by a specific school and for some databases, the full-text capability may be procured separately. Compounding the issue, many databases have only selected journals that are full-text, and even within these full-text databases, journals with full-text capability change frequently because of licensing agreements. There are numerous medical related full-text databases, for example, Elsevier's Science Direct, MD Consul, EBSCOs Academic Search Elite or Health Source:Nursing/ Academic Edition, and InfoTrac OneFile Plus, to name a few. IDIS, a pharmacy specific database, also has options for full-text capability. Obviously, some journals are "free-standing" and are available not full-text in any database.

There are numerous methods of how to organize strategies for full-text searching; however, there is a basic hierarchical structure that should be applied that will enhance

the user's ability to follow a logical order beginning with the easiest, then proceeding to the more difficult or time consuming. Obviously, each school of pharmacy will have different full-text resources available and this must be taken into account, but the logical order should remain about the same.

Designing full-text guides involves combing 3 factors: identification of available resources; where they are physically or electronically located; and illustrating the ease of accessibility. The order of these three will vary among institutions. The task is to evaluate these 3 factors and design a straightforward guide so students can easily locate full-text articles.

Pharmacy Specific Resources

The first full-text category listed should be those resources specific to pharmacy. These resources would be those that are immediately available and likely most pertinent for the pharmacy student. A good example of this type of resource would be print or electronic journals specific to the pharmacy student that might be physically available in the school of pharmacy.

A second example of these types of resources would be pharmacy and/or medical specific full-text databases, e.g., IDIS, MD Consult, Cochrane, Ovid, etc.

University Resources

The next category of resources are those immediately outside the realm of the pharmacy school. A good example of this type of resource would be both the print and electronic collection within the on-line catalog of the university library. University libraries catalog their electronic resources different ways, for example, some place a journal title link in the catalog to the Web location of the journal in their on-line database. Others place the full-text electronic journals into a separate listing within the library's Web pages, while others may do a combination of both. The reason for mentioning this critical item is that pharmacy students are often not well versed as to what full-text resources are available or how to access them via the university library, especially full-text capabilities due to the many databases and other resources, which is discussed below in more detail.

Most, if not all, university libraries have an interlibrary loan system (ILL) for obtaining full-text articles. The foremost problem with ILLs is the lack of promptness. Often, receipt of the article may take in excess of 2 weeks. Student assignments will normally require the article sooner than 2 weeks.

University full-text medical databases are one of the best sources for articles. Some have already been mentioned above, others databases are the Cumulative Index to Nursing and Allied Health (CINAHL), Wiley Interscience, etc. One of the major difficulties is that students are often not aware of the databases or cannot easily find them on the university library's Web pages. Full-text databases must be clearly and easily identifiable to the user. It serves no purpose to have very expensive full-text databases, yet students are unaware of them or worse, do not know how to access them.

Other Resources

The category of other resources is basically a last resort category, i.e., when the above strategies product no results. Considerable trial-and-error attempts will likely occur in this category. Several Web sites have very good resources (links) to free full-text

journals, e.g., The Free Medical Journals[3] or PubMed's LinkOut.[4] This search strategy is very time consuming, but the user might be fortunate and locate the desired journal at one of these sites. There are numerous other journal sites created by academic medical libraries or medical associations. Some are free to access, while others require an id and password.

Summary

Schools of pharmacy should develop easily used strategies for finding full-text articles and preferably, structure them in some type of sequential order depending on resources available. The simpler the guides are, the more likely they are to be used and understood. Also, placing them on the Internet will enhance the overall utility and students' ability to find articles, tremendously reducing library personnel's time by having to explain an often complex and lengthy procedure. Full-text guides will assist toward a lifelong learning process. Current information regarding drugs and diseases will always be a necessity.

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