

The Library: Forgotten By Students?

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Introduction

One of the stranger aspects of being a college professor in the sciences or engineering is that you spend a significant amount of your time preparing students for, and being a mentor for, technical, professional, and scientific jobs and careers you have never had and never will have. For example, I am a faculty member in a department of chemistry and biochemistry, and teach a large number of students who want to become doctors and dentists, as well as a hefty number who intend to become some type of engineer. Additionally, some of them wish to go on to graduate school within the discipline and a few do want to earn a four-year degree and get a job as a bench chemist. Whatever their aspirations, though, those students end up in many of the same undergraduate classes and must know how to use many of the same tools. Undoubtedly the largest tool, and the one many of us take for granted—or rather, take for granted that students already know how to use—is the library.

Students often come to colleges and universities only knowing the basics of how to find an item in a library, and with the attitude that an internet search will save them from having to enter the library at all. Almost none now have any idea of how to use a card catalogue that has actual cards. Most of them have some form of computer terminals in their high school libraries and local, public libraries, but may have had no instruction on how to use such terminals. They have very little formal instruction on how to find or utilize the holdings of a technical library—something that I, as a faculty member in the sciences, consider critical to their education. As libraries change, as the amount of information expands, and as access to information becomes more available to students, we need to ensure they know how to use all the resources of a library, and how to use them effectively.

Using The Library

The history of universities is intimately connected to libraries. Certainly, there are ancient libraries that pre-date the idea of universities and university study, but somewhere in the past 200 years libraries and universities became inexorably intertwined. When Thomas Jefferson designed the University of Virginia in the early

1800s, secular man that he was, he placed the library at the center of what he called his, “academical village,” and didn’t even bother to construct a church, cathedral or chapel on the campus (the centerpiece of many earlier universities).(1)

History may yet find some exact time in the last fifteen years, however, as one of the critical moments, the turning points, the crucial junctions, in how libraries are used. The reason is the internet, and its connection to the resources contained in

libraries. Libraries have been transformed in that time from a collection of books to nexus points for the global network. Among the many changes the internet has brought about is one that professors and librarians too often neglect: students seldom have any formal training in how to use the internet, how to relate internet sources to print sources, and how to relate both to their school studies.

A technical library, or a library with a large technical section, is very different from a public library, a school library or a collection of internet sites. The skill of how to use a technical library, which at first glance seems to be less relevant since the advent of easy internet access, is in fact far more relevant. That is because most students do not really know how to use the internet properly.

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Ask any college or university librarian if they’ve seen students walk into the area that was once reserved for the card catalogue, sit down at a terminal, stay there for perhaps an hour doing SOMETHING, then finally come up to a librarian and ask for help. It’s a good bet that the librarian you ask will have seen this numerous times. I saw this first hand once, shortly after assigning an out-of-class project to a freshman chemistry class, on an occasion when I happened to be in the library asking one of the librarians for help on some inter-library loans. When I asked her about it, she commented that for a number of entering students, they saw no point in using a library at all, but at the same time thought the beginning and end of all internet use was and is a Google search.

Perhaps the most amusing example of this from the point of view of a faculty member teaching in the sciences is the case in which students must do some form of report on a famous scientist. Such a report is a favorite of some faculty, because it puts a human face on what often appears to the student to be no more than a pile of facts, figures, equations, and names. There are plenty of biographies that have been written and published as stand-alone volumes. There are plenty of bibliographical entries in technical encyclopedias. But ask a student who has almost no skills in library and internet use to search for Tesla. Nikolai Tesla is famous for a number of scientific advances in the nineteenth and early twentieth century, but “Tesla” is also the name of a heavy metal band from the 1980s and ‘90s. Guess what the students find with their Google searches? It never fails.

This, then, is the first problem with proper student use of their university library.

We send the students over, but they already think they know how to use the internet, and thus know how to use a library. To combat this, faculty need to work with librarians and set up times when students can be taught the basics of their university library, and how to use an electronic card catalogue, with all its internet links. Most librarians are quite willing to help, and are happy to be called upon. A brief tutorial or class like this gives the students both the essential information about how to search their university library database, and a human face—the librarian—to go to when they encounter problems.

Another problem that easy internet access has fostered is the student belief that books are either not as useful as the internet, or are only the sources of outdated information. Students do not see the depth of knowledge that comes from secondary literature, such as a set of technical encyclopedias like the Kirk-Othmer, or any of the primary literature. They see no difference between a news release and the actual primary source from which the news release comes. There is so much information available to them that they need help even to know that they must learn how to tell what is worthwhile and what is superfluous.

An example of this inability to tell what is important and what is “fluff” can be seen by Google searching the word “polyethylene.” A search done as this essay was being written called up as its first three responses the Web sites of a drainage pipe association, a datasheet, and an Exxon site. All are helpful, but none tell the details of how polyethylene is made from ethylene, or what types of catalysts and conditions are required for its manufacture. The Exxon site, for obvious reasons, is not going to discuss any waste products or detrimental by-products of polyethylene manufacture. Students just entering college don’t necessarily know that one of these sites is all about applications, one simply gives data without any information about synthesis, and one is by definition going to have to show polyethylene in its best light. To the untrained student, these are simply three sources. They need the help of faculty and librarians to sort out the information.

A third problem the easy access of material on the internet engenders is that non-edited material is pulled up and cited by students as if it were as reputable as an edited, refereed source. Students are unaware that many internet sites are posted by a person or persons with an agenda. If you are searching for information on the refining of platinum, for instance, you can most likely find sources about it on the Web from one of the major industrial concerns, Johnson Matthey, as well as information from environmental groups, such as Earth First. Neither of these will give information and knowledge as evenhandedly as will an edited, reviewed book by a scientific publishing house. Students need to be taught these differences as well, again by both their teachers and the librarians.

“Students do not see the depth of knowledge that comes from secondary literature . . .”

To combat these situations, faculty members should assign projects that involve library use but that have certain guidelines and rules. Such guidelines might include an insistence on a certain number or percentage of print sources for a project. As well, a project may be assigned that requires the use of at least one technical encyclopedia reference. In addition, it may be necessary to have students include one or more talks with a reference librarian as they research their project. For this last, it would appear obvious that there should be some faculty-librarian discussion before the projects are

assigned. A record can be kept in the library, or perhaps students can attach a sheet signed by the librarian when they turn in their final project.

In my own freshman-level general chemistry class, I take groups of students to the library specifically to have a reference librarian walk them through the proper use of the electronic catalogue and its internet connections. In addition, I insist that no more than 50 percent of sources for any out-of-class project may come from the internet, and point out in several different class periods that books in the university library have been edited (which I define for them as meaning that at least one person—the editor—has seen the manuscript besides the author), while internet sources

can be posted by anyone. Importantly, I also have a conference with each student or group after a bibliography has been handed in (usually at mid-term), discussing the sources they have found, and directing them to others if they have missed important information.

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Conclusion

By the time our students leave us, hopefully with a shiny, new sheepskin in hand, there is a great deal more we should have conveyed to them than just the technical competencies of our fields. Of course, they need those facts. No professional is considered worthy of their degree if they don't have their basic, technical knowledge down. And yes, we have a certain anxiety about those students who don't seem to have gotten the basics down well. But they also need to know how to find information, how to determine if the information is reliable, and how to find help when they can't get the information they need. Believe it or not, when we do things well we can teach them all those things they need to know.

Endnote:

(1) A large amount of Jefferson lore is injected into University of Virginia students. The author was a graduate student in the UVa Chemistry Department of Mr. Jefferson's academical village (yes, they really still do call it that) from 1987-1991.