IT’S THE INFORMATION AGE, SO WHERE’S THE INFORMATION?
WHY OUR STUDENTS CAN’T FIND IT AND WHAT WE CAN DO TO HELP
Jill D. Jenson

Abstract. Although most college faculty are aware of the problems that students encounter when conducting research using the Internet, fewer recognize why their students lack success when using the electronic databases and indexes to which the institution’s library subscribes. In this article, I point to teachers’ assumptions about their students’ “computer literacy,” as well as to the students’ lack of hands-on experience in an actual library, as potential sources of the problem. I provide practical, detailed suggestions, which are useful across disciplines, for overcoming these obstacles.

A late semester e-mail from the brightest student I had in my freshman composition course that term began, “Hi Dr. Jenson, I have two questions about my works cited page.” Her questions were (1) Is U.S. News & World Report a magazine? and (2) Would the Journal of the American Dietetic Association be considered a scholarly journal? I have taught courses that require students to conduct library research for fifteen years, but it was not until I read these particular questions from this student that it hit me. Because most, if not all, of the research that students now do at the college level is conducted online, the context for that research has been lost. The library itself has disappeared from the process, at least from the students’ perspective. That revealing e-mail message catapulted me to an earlier conversation with another student in the same course. This conversation took place during a computer lab session in which the student was dutifully searching for information to use in his research paper. Suddenly, his hand shot up in frustration. “I’m finally finding some sources,” he said, “but look at how short they are. I can’t use these.” Looking at his computer screen, I quickly understood the problem: He was searching in our library’s Newspaper Abstracts index. He had no idea that he was looking at summaries of the articles rather than the articles themselves. In fact, he had no idea what the word “abstract” meant.

These two students represent students in institutions of higher education everywhere. Although today’s students have spent extensive time using computers, they have spent little or no time in an actual library, nor have they worked with actual hard copies of the items they would find there. As a result, one computer monitor depicting a potential source of information looks as confusing as the next. Differences between journals and popular magazines, articles and abstracts, and annotations and advertisements have been lost on those whose education has been largely executed in the information age.

Although those of us who work with college students conducting research of any kind are all too familiar with the problems associated with students’ reliance on the World Wide Web for sources of information, that is not the issue I want to address. We realize the ease with which Web sites are plagiarized, and we are well aware that most students exert little effort to determine the academic value of Web pages they use in their papers and projects (Jenkins 1999). We know their understanding of bias or slant often is limited and that their skill at tracking down the original source of any given site is lacking. As a result, many excellent guides for critically analyzing Web sites already exist; that problem is being addressed. The issue that I want to consider actually is much more fundamental.

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For decades, we have accepted that for students to be successful, they must leave our institutions having reached a satisfactory level of what we label “information literacy.” In 1989, the American Library Association Presidential Committee on Information Literacy provided what has come to be a widely accepted definition of that term: “To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information” (American Library Association). Given such a universally held belief, the question is, If our students are so much a part of the information age, a time when the best sources of information that academia has to offer are at their fingertips, why do they have so much trouble demonstrating information literacy in terms of locating that information? Why do professors campus-wide complain about the quality of their students’ end products, while at the same time students express equal frustration that they “can’t find anything” on topics that in fact are widely addressed in the literature?

Is it the students’ fault? Have they just gotten lazy? That answer is tempting to embrace because it requires little from those of us whose job it is to help students produce the best work they can. After all, if the problem is theirs, only they can fix it. What I have come to discover, however, is that students have trouble producing good research because they have not been given the foundation necessary for doing so in a world where research of the available literature, traditionally conducted hands-on in an actual library, is now conducted almost exclusively by looking at a computer monitor. In fact, students can be taught effective research skills, despite the complexity of the electronic indexes and databases now used to do such work. Before that can happen, however, those of us charged with that education process must understand the source of the problems that our students are experiencing and then work with them to solve those problems.

Diagnosing the Problem

Having taught research-based writing courses to students ranging from first-year to graduate level during the period when the technology revolution has hit with the most fury, I have seen that many professors in higher education settings have come to take for granted that students are “computer literate.” In fact, a fall 2000 survey of more than four hundred thousand incoming first-year students conducted by UCLA’s Higher Education Research Institute showed that 78.5 percent of respondents had used computers on a regular basis during the year prior to their freshman year in college. Understandably, such statistics lead higher education faculty to conclude, as did the March 2001 issue of AFT on Campus (“Today’s Students” 2001) when reporting the survey results, that “incoming students are highly computer literate.”

But what does “highly computer literate” really mean? That students have superb manual dexterity for manipulating a mouse? That they are familiar with windows, screens, hyperlinks, buttons, and frames? Granted, many of our students can surf the Net at breakneck speed and can create sophisticated personal Web pages. Too often, however, such prowess does not translate to conducting academic research, the backbone of higher education. Unfortunately, we may be failing to accurately define the term “computer literate” for this type of educational purpose.

A recent study conducted at the University of North Carolina (Holman 2000) seems to confirm students’ general inability to conduct academic research. The study compared the effectiveness of computer-aided instruction (that is, an online tutorial) to traditional classroom instruction led by a reference librarian for teaching library skills to first-year students. Pretest and posttest scores were used to determine the degree to which the students had learned what the instruction was designed to teach them. Examples of pretest questions included “How would you find material written by Toni Morrison in the online catalog?” and “If an article is not full-text in InfoTrac, how can you find out where it’s located?” The results showed that although students who received either computer-aided or traditional classroom instruction made significant gains from the beginning to the end of that instruction, nearly two-thirds of the students in both groups scored under 70 percent on the posttest, which was consid-...
Dietetic Association if their experience with either is exclusively online, where each “page” looks the same? They do not see one page that is glossy and one that is flat, one with photographs and one without, or one with slick advertisements and another without. How, then, can students be expected to do as the rest of us have done—adapt traditional research skills to the electronic environment—when they have never been taught what we learned through using those traditional search methods? Most of them have never used a card catalog, looked up a search term in the Library of Congress Subject Headings reference, or actually held a scholarly journal. If we want our students to become successful researchers, we must stop assuming they have the same background and experiences that we have and start teaching them how to meet our research objectives given the realities of the electronic arena in which that research now takes place.

But who are “we”? Whose responsibility is it to get students to that place, and how? As excellent as the library staff is, they can hardly be expected to shoulder the task alone. Nor is the answer to simply “let them loose,” the confessed approach to library research of one beleaguered colleague who decided to leave the problem wholly in the students’ hands. For a goal as significant as helping each student reach information literacy, a collaborative effort among all involved in the process is needed. Hirsch concluded that allowing students to take advantage of the new technology means not only seeing to it that they have access to the technology but also ensuring that they possess the knowledge necessary for them to make effective use of it. Our responsibility as educators is to define the knowledge our students need and—through a lively variety of pedagogical techniques—to help them master it. (2000, 9)

Unfortunately, although the goal is clear, the process, the actual pedagogical techniques, for bringing theory to practice is less so (Langford 1998).

Solving the Problem

The following six strategies can be used in part or in full by nearly any educator, at any level, and in any discipline to create positive change in students’ research process and products when electronic library searches are used.

Teach Students Why They Are Seeking Information and Where They Are Most Likely to Find It

A problem inherent in nearly all assigned research projects is just that—they are assigned. The motivation for completing the work often does not stem from a true desire to learn, but rather from a need to complete a certain number of credits. Contrast this with the actual purpose of research: discovering the answer to a question the investigator truly desires to know. Those actively involved in research have a real appetite for uncovering the puzzle pieces and then assembling them to make as clear a picture as possible of what is already known, all in an effort to add yet another piece that would make the image even sharper. Obviously, this is not the research goal of most students, particularly undergraduates. Although we cannot expect students to set the same goals as those of us who are investing entire careers in this pursuit, we can frame the activity in such a way that they can better understand why such assignments are given. What are their questions? What do they want or need to know? What are their guesses as to why things are as they are? What do others think about those guesses? Having the students face such questions reframes the entire process, even if the general topic is one that remains assigned. Once students realize that they, too, have a reason for finding out what already has been said and what research already has been done on an issue, the assignment transforms into the real stuff of academic research. When that happens, the desire to make the search efficient and effective naturally increases.

This, then, is the time to help students see the difference between searching the institution’s library for online resources as opposed to searching the Internet. Many students equate typing their broad topic into a Web browser with searching the electronic indexes and databases to which their school library subscribers. After all, both experiences involve sitting in front of a computer and making a choice by clicking a mouse; thus, they conclude, the situations—and the results—are the same. Discussing the differences between the two methods of research helps students understand the advantages of using the library’s resources. If students click on the school library’s databases and catalogs, they have, albeit virtually, stepped through the doors of the building itself. If they click on an Internet search engine, however, they have hurled themselves into the entire world, the world of cyberspace. Once students understand and acknowledge that difference, they seem almost comforted by taking the less risky step of remaining in the confines of a more familiar, albeit electronic, circumscribed world.

Furthermore, because students do not receive an invoice for a subscription to a database or have the experience of deciding on a subscription, they may not know that such a process occurs in order for them to access library materials. Many do not understand that academic libraries select and pay for electronic services, just as the students themselves might select and pay for items they enjoy for leisure reading. They also fail to realize that such resources are not available everywhere, hard choices have been made, and budgets and shifting priorities affect these difficult choices. Students’ complaints about paying technology fees often have more to do with this lack of understanding about the product or service that the fee is buying than the amount being paid. Purchasing a university’s library resources is just one case in point. Therefore, briefly explaining the costs of online services and the process that reference librarians typically use to choose them clarifies for students why only certain materials are available online at certain institutions and why some materials are not available electronically but may be offered in other forms, such as paper or microform. Such an explanation underscores for students that when they choose to use the library’s resources, they have chosen to rely on the expertise of those whom the institution has carefully selected to make such decisions. This team of experts has already put the available material through a preliminary screening process, a stark contrast from the process by which material is posted on the Internet. Although such a filter does not guarantee that every item
available through the school’s library is worth using in academic research, it certainly increases that likelihood.

Teach Students the Language of Library Research and Then Teach Them the Language of Electronic Library Research

As mentioned previously, perhaps one reason for the unmerited confidence that North Carolina students had in their library research skills was that they simply did not know how much they did not know. They simply may have lacked the understanding needed to assess their knowledge or the words needed to verbalize the questions they had about their research skills—or the lack thereof. Unfortunately, the number of words in the needed lexicon has mushroomed with the advent of the computer technology now used to conduct research. Whereas students could previously get by with learning terms such as “periodical,” “journal,” “index,” “bibliography,” “citation,” “card catalog,” “Library of Congress Subject Headings,” and “call number,” they now must learn a whole new language in addition to that previously required: “Boolean operator,” “meta search,” “general database,” “specialized database,” “text image,” “verbatim image,” “full-text image,” “access date,” “marked list,” “search wizard”—the list certainly could go on. Granted, students may understand some of these terms based on past computer experience; however, most do not understand them in relation to conducting research. This situation is complicated by the fact that because many of us in the role of educator use such terms daily, we tend to forget that others must be taught the language of the discipline. In the end, there is no benefit to offering suggestions, providing explanations, or giving instruction using words that students do not understand and cannot place in context. Imagine the potential for confusion resulting from this advice: “Page numbers of full-text articles coming from online databases that do not use verbatim images are omitted when referring to that source in an in-text citation.” Huh?

Therefore, although it may seem rudimentary and even patronizing, unobtrusively integrating vocabulary instruction into students’ daily work will make it a routine part of their learning process, thereby removing any stigma they may feel about asking for help with terms they do not yet know or understand. Such instruction could be as simple as isolating a possibly problematic word used during a teaching session and taking a moment to stop and ask, “Who can tell us what that means?” In their responses, students not only get the opportunity to become part of the teaching process but also have a chance to articulate what they are thinking, which in turn allows the instructor to make needed revisions in those thoughts. Another useful exercise is a variation on the one-minute paper (Angelo and Cross 1994). Begin the class period by giving each student a half sheet of paper and asking them to define a single term or to distinguish the meaning of two terms they may easily confuse. Having students submit their responses anonymously removes any fear of “looking dumb” and results in all students offering a response, regardless of how close to or far from the mark it is. At this point, correctness is not the issue. From a teaching and learning perspective, incorrect responses are as helpful as those that are correct because they identify the source of the confusion. Such checks take little class time or instructor effort but reap big dividends in clarifying the often surprising points of misunderstanding. Moreover, the definitions are formed with the students’ own words, thereby ensuring an internalized understanding of the terms, a feature lost on traditional vocabulary lessons that merely ask students to match terms and definitions.

Only when the language of research is understood are students ready to move on to applying those terms to electronic search methods. My student who was looking at abstracts thinking they were merely very short articles would not have made that mistake if I had taken the time to teach the class what abstracts are, what function they serve, and how they are useful to a researcher. Taking that knowledge and then building on it by scrolling through a list of online indexes and asking what we could expect to find in each would have clarified the student’s confusion. He would have known exactly what to expect before ever clicking on the Newspaper Abstracts index.

Allow Students to Practice the Specific Research Skills Needed to Successfully Complete the Course

In discussions with other instructors, I found that many considered it the responsibility of the reference librarians to teach their students needed library skills. Despite how heavily we depend on these professionals to teach research skills and how well they do that job, they cannot be expected to know exactly what each faculty member’s assignments entail, nor what each expects of students’ final products. Therefore, creating a course-specific, step-by-step exercise that leads students through the skills needed to successfully complete the course not only provides practice for the task at hand but also supplies a ready-made set of operations for which they might more readily seek further assistance from a librarian. Moreover, the vast majority of librarians would welcome the opportunity to collaborate with other educators on such an exercise; the importance of working together to help students carry out course objectives cannot be overemphasized. Such exercises should be written for the least experienced among the student population being served in an effort to make each one, ultimately, an independent researcher. This means including step-by-step instructions that have been tested and proved accurate each time the exercise is assigned. Given the continual updates and changes that academic libraries necessarily experience, this step is crucial. Providing incomplete, inaccurate, or misleading instructions often is more detrimental than providing none at all. Do not worry about offending the more experienced students; they simply will skip unneeded instructions and complete the work with a minimal amount of effort, proving their readiness for locating answers to their own research questions.

Whether the students are experienced or inexperienced, however, the last item on such a research exercise should give them the opportunity to write down any questions they still have about what they are to do in the library or how they are to do it. A recent group of my upper-division business students, all of whom were in their junior or senior year, recorded a wide range of questions that remained even after they had completed what I thought
was a thorough preparatory exercise: How do I determine whether our library has (owns) an article? How do I figure out the best search terms to use? Are hard copies of articles better to use than online copies? What is the difference between using the word “and” and the word “or” between search terms? Which sources (books, journals, newspapers) have the best information to use for my research?

The students who posed these questions most likely would not have asked them had they been prompted to do so in a classroom setting for fear of asking a “dumb” question. The result? I never would have known that those issues needed to be addressed. Moreover, when I did answer the written questions in front of the entire class (without identifying the person who asked the question), it was clear that many in the class needed the answers, not just those who originally put the questions in writing.

Include a Trip to the Library as Part of the Students’ Learning

Many students are convinced that they can and should do all of their library work in their pajamas and slippers from the relative comfort of their dorm rooms or apartments. Can we blame them? In an environment where employees telecommute and everything from cars to groceries can be purchased online, is it any wonder that students are reluctant to find that under certain circumstances, they may have to get dressed and actually visit the library? Are we all not spoiled by the ease of simply printing the results of online searches? Understandably, then, going to the library shelf to find a hard copy of a source that is unavailable online seems a burden, no matter how promising it looks. As a result, students tend to confine their research to what is readily available rather than to what best responds to the question their research seeks to answer.

To be fair, educators sometimes perpetuate the myth that all research can be done from the comfort of home by teaching library skills through exercises or tutorials that require students to do nothing but sit at a computer. Consider, however, how limiting such a search can be. Without actually going to the library, non-circulating materials such as valuable reference books usually are unavailable to the researcher. Unless students are shown otherwise, without actually going to the library they may never learn to appreciate the distinguishing format and design differences between scholarly journals and popular magazines, which, when physically observed, are immediately apparent. Without actually going to the library, students cannot use thousands of relevant pieces that continue to be made available only on microfilm. Unless they actually go to the library, students cannot access potentially helpful books that they find using an electronic card catalog. They also may never realize that finding a library book by its call number can lead to the happy accident of discovering that all the books on the shelf surrounding that one are about the same topic.

To help students realize these benefits, their library instruction needs to include activities that physically get them into the institution’s library. A colleague who took this advice sent me an e-mail message that said: “I took my students to the library and they loved it—they wanted to go back. It was the best class I had all semester.” Ways to help students appreciate the importance of such a trip can easily be integrated with skills being practiced to achieve successful online searches:

1. Ask students to use the library’s online catalog to find a book that looks promising for their research, but then ask them to go find it, evaluate its value to their project, look at other books on the shelf near that one, and determine which, if any, they will check out of the library.

2. Lead them to an article in one of the library’s online databases that provides only a citation or abstract in electronic form but that is available in the library, in full, in another format. Then teach them how to determine whether the library does indeed own the periodical in which the article is contained. Ask students to go find the article, and have them photocopy a page of it to show that they were successful. Once they learn that this is not a daunting task, they will be more receptive to using the best sources of information they find, rather than the most convenient.

3. Have students travel in pairs on a field trip to find a scholarly journal and a popular magazine of your choosing. Ask them to compare and contrast what they find using criteria such as whether the periodical has advertisements, whether it has pictures or other graphics, where the table of contents is found, whether the authors cite their sources, and so on. Identifying and seeing the physical differences between these types of sources makes students better able to distinguish them when viewing electronic versions, despite their being far less obvious in online formats.

4. For comparison purposes, provide students with copies of an online article that has been scanned into a database and the same article found at the library in its original hard copy. Because students have come to accept that graphic aids, figures, format features, and photographs often are missing from full-text articles, such omissions are not questioned. However, these pieces often play an important role in clarifying the information presented, and a tangible demonstration of this helps students understand why a trip to the library might be necessary. For example, one of my students using an online source included as part of a quotation words that originally were a heading for that particular section of the article. Even though his quotation made no sense with the extra words added, he was convinced it was “right” because he had copied it verbatim from his online source of information, which obviously included no typographical features to distinguish the headings from the text. Until all online articles are presented as full-image rather than scanned texts, such demonstrations are important. Even if the library does not own a particular article in its original format, students will learn what potential pitfalls they need to be aware of when using online versions by seeing the differences between the two.

Teach Students to Decipher What They See on Their Monitors during the Search Process

The students I mentioned in the opening paragraph taught me that when they looked at a computer screen, they did not always understand what they were seeing.
Beyond being unfamiliar with the words used in library searches or the physical differences among sources, students can be misled by the colors, boxes, graphics, and animation of electronic information, all of which blend together until an online database intended for serious research looks amazingly similar to a commercial Web site. This situation is further complicated by the fact that each vendor of the many available databases chooses to label, categorize, and display information in different ways. The search buttons are found in various locations, information is indexed in different ways, and options for searching and printing are too numerous to mention. Milstead (1999) described the predicament this way: “What is the poor searcher to do? Only the most dedicated will set out to learn the vocabularies and indexing policies of a number of databases, and even such a paragon would have to use unfamiliar databases from time to time” (1999, 45). Needless to say, even the best college students typically are not yet among that elite group of “most dedicated” researchers.

Although it may take time that instructors do not feel they have and it may seem frivolous to students, spending some classroom time simply identifying what it is that students are seeing when something pops up on their computer screens will be time well spent. Among the many questions that need answers are ones such as these:

1. What is the difference among the search options (for example, complex search, advanced search, subject search, and keyword search)? How is each used most effectively? What are the differences in the results?

2. What do the various numerals and letters mean in a citation that looks like this: v274 n5 p366D(1)?

3. Where is the name of the database found? The periodical?

4. Where does the abstract end and the article begin?

5. Why is there a print command on the screen when print is already an option under “File” in the browser’s menu bar?

6. Why do the page numbers that the citation says the article is on not match the page numbers that appear when the article is printed?

7. How can I tell what kind of source this is (scholarly journal, weekly periodical, newspaper, and so on) so I can cite it correctly?

If possible, the way to elicit the most student response and foster the most inquiry during such an exercise is to first decipher some screens together and then have each student on a computer conducting a hands-on search. This is bound to lead to more questions. Mere demonstrations of these techniques using laptop computers and projectors are difficult for students to apply when it comes time to do their own search. Students actively involved in the process will learn more quickly and retain that learning more readily than those who have only observed what they need to do by themselves at a later time.

If Problems Remain, Ask Students to Record, Step-by-Step, the Search Process They Are Using

Identifying the specific problem point of a student’s unsuccessful electronic search can be nearly impossible if the student is asked to recount from memory the exact search terms or the exact sequence of mouse clicks he or she used. A more effective approach is to ask students who are having trouble producing satisfactory results to record—step-by-step—the process they used. This allows replication of that process, which, in turn, uncovers the exact point at which a more successful choice could have been made. Although students may protest that recording the process is tedious, it typically needs to be done only once before their problems are solved and the protests are put to rest.

The Result

In short, even in the information age, when nearly every student involved in higher education has unlimited access to computers and the information they so readily provide, achieving information literacy continues to be inextricably bound to fundamental concepts that most of today’s educators first learned in a way that provided a context for their own move to electronic-based library research. Consequently, it is unreasonable for those same educators to expect their students, who by and large are products of the information age, to have this same experience, experience that educators gained by way of card catalogs, paper indexes, and legwork. Knowledge is gained incrementally, moving from that which is familiar to that which is unfamiliar. A recent piece in the NEA Advocate (“A Primer” 2002) put it well: “Paraadoxically, what students already know is probably the most important determinant in new learning” (6). Therefore, those of us in education do our students an injustice when we assume that our familiarity with traditional library research methods translates to their experience using a mouse and looking at a computer monitor. An intermediary instructional layer is needed. Although instructor and student alike struggle to keep pace with the rapid changes in information delivery, educators need to recognize and capitalize on the foundation for research that they built the “old-fashioned” way. In the end, even a fast-paced technological learning environment may require taking a few steps back to move many steps forward.

Key words: electronic research, technology, Internet, information literacy

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