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ABSTRACT

The object of this study was to assess the value of teaching online searching techniques to undergraduate students for the completion of a specific assignment in a human biology course, both as a research tool and as a means of supplementing the limited holdings of primary medical literature in a small college library. Students were divided into two groups, with one group using the online version of Index Medicus to obtain citations for the assigned paper, while the other group used the paper version of the index. For a second paper, the groups' use of online or paper versions was reversed. Responses to a questionnaire completed by the students indicated that they were satisfied with the results of their online searches, that online searching permitted them to find citations that were highly focused on their topics, and that they were able to find the citations faster than by hand. Faculty found no difference in the quality of the papers based on the use of online or printed versions of the Index Medicus, but found that, as usual, the second research paper was better than the first one for students in both groups. Although students believed that online searching should be taught, they also strongly supported the teaching of the print versions of the online resources. A further evaluation of the use of online searching is now underway, using a CD-ROM version of Index Medicus, in order to determine whether such an online version can provide students with more opportunities to undertake online searching at no additional cost, and without the need for as much assistance from the reference librarian. (EW)

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ONLINE ABSTRACTS AS A SOURCE OF INFORMATION
FOR UNDERGRADUATE RESEARCH IN A SMALL COLLEGE LIBRARY

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)"

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Objectives of the Project

Our goal was to add online searching to the library research techniques taught to undergraduate students in a course on Human Biology. The course assignment requiring the library research was a three to five page paper in which students were asked to evaluate the safety and effectiveness of commonly prescribed treatments for various medical conditions. It was our intention to teach the students to conduct their own online searches of Index Medicus, thus enabling them to quickly identify relevant articles and to gain access to abstracts of articles not located in our library. We wanted to see whether the students could use these abstracts to supplement the limited holdings of primary medical literature located in our small college library. We also wanted to try to assess the importance of learning online searching, both for the completion of this specific assignment and for future literature retrieval.

Procedure

Students in Human Biology write two library research papers; one during the third week in the term and the second during the seventh week of the term. Instruction in online searching and appointments for conducting searches were offered to each student for one of their papers. The class is divided into two laboratory groups (approximately 30 students each) and one laboratory group conducted online searches for the first paper while the other laboratory group used the print version of Index Medicus; for the second paper, use of print or online Index Medicus by the lab groups was reversed. Offering only one online search per student reduced the number of search appointments to a level which one librarian could support and, more importantly, allowed for a comparison of each student's results when using print or online search techniques.

Our original intent was to use a protocol that would allow for statistical testing of the hypothesis that access to abstracts would result in papers of equal or better quality to those in which all cited articles were read in their entirety. We subsequently decided that this would cause undue disruption to the normal flow of course activity and would create anxiety among the students. As a consequence, our analysis of the outcome of the project consists of: a review of saved copies of the online searches conducted by the students, a review of the papers (their topics, bibliographies, and grades), questionnaires completed by the students at the end of the course, and librarian and faculty observation and analysis.

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Results

Online Searches:

Students scheduled individual search appointments with a librarian and then conducted their own searches after consultation about their search strategy. The librarian was available to assist during the search as needed. The average length of a search was 23 minutes (ranging from 10 - 41) at an average cost of \$7.50 (\$5.00 - 12.00) for searches conducted during evening hours on BRS/AFTER DARK and \$20.00 (\$9.00 - 32.00) for searches conducted using the day on BRS/BRKTHRU.

The students spent an average of .75 hours preparing to conduct their search (using other medical reference materials or reviewing the print Index Medicus) and an average of 2.5 hours completing their library research after the search was completed.

The mean number of citations retrieved was 34 (25-40) and 1.1 abstracts (0-5) were reviewed per search. The librarian review of the online searches revealed that most of the abstracts included the type of specific information required for the papers: research methodology, data and conclusions regarding the effectiveness and safety of a given treatment; or a comparison of different treatment types.

The student search strategies were all quite similar; the correct MESH subject heading was selected for the disease and the treatment, and then modifying phrases such as "controlled trials" were used if further narrowing down was necessary.

Papers:

The completed work for the papers written using online searching and the papers written using the print version of Index Medicus was reviewed. The bibliographies of the papers typically included under 10 citations. The proportion of secondary sources, primary journal articles, and abstracts of primary journal articles was as follows. For the "online papers", 2.8 (0-14) secondary sources were cited, 3.4 (0-11) journal articles and 2 (0-5) abstracts. For the "print papers," 2.8 secondary sources (0-5), 3.3 (0-9) journal articles and no abstracts (unavailable) were cited.

A review of the paper topics for the print papers versus the online papers revealed no major differences in the selection of topics. The students all were allowed to select from the list presented by the faculty. There were a few exceptions however; for the online search paper, a few students chose topics that would not be supported by our journal collection — topics that were of special interest to them and that they selected on their own, not from the prepared list.

No differences in the grades assigned for online papers compared with print papers could be attributed to the use or non-use of online searching or the availability or non-availability of abstracts.

Questionnaires:

On the whole students reported being very satisfied or moderately satisfied with the results of their online search. They were asked to comment further on the contribution that the search made to their overall library research. Most students reported that it enabled them to locate citations

that were highly focussed on their topic. They also reported that it enabled to find citations much faster than by hand; one student further commented that finding the information quickly enabled her to spend more time working with the information. Of those students who used abstracts retrieved online, the general consensus was that the abstracts enabled them to add important information to their paper. One noted, however, that she would have preferred to have been able to see the whole paper.

The students were in agreement that everyone should be taught to do their own online searching. The benefits were time-savings and the ability to find highly relevant articles. However, many students added that online searching is not necessary for every research topic and some speculated about its cost effectiveness.

We also asked the students to specifically comment on whether the print version of an index should be taught if online searching is available. Almost all of the students said that the use of the print version should be taught, and that it should be taught before doing online searching. Their explanations were varied: most thought seeing an index in print was important to understanding the structure of the database and for "getting a feel for it," and they felt it should be taught first so that they wouldn't become "lazy" and want to rely on the computer alone. Almost all of the students stated that learning print search techniques was necessary because online searching might not always be available.

Librarian and Faculty Observations:

According to the faculty, no major differences in the quality of the online papers versus the print papers was apparent. The most apparent trend in paper quality continued as in years past: students tend to perform better on the second paper that they write — presumably because they have a clearer understanding of the teacher's expectations and they have had the practice of writing the first paper.

The faculty member whose group conducted their online searches for the first paper did note however, that his students' first papers seemed a little better overall than the first papers he typically received in previous years. He wondered whether this could be attributable to the use of the abstracts. His speculation stems from the fact that the abstracts contain primarily the outline of the research protocol and the data evaluating a treatment. This data-based reasoning is an important component of a successfully written student paper, yet it is difficult for the students to think and write in this way. Perhaps the fact that abstracts present this information in a concise, condensed way helped the students focus on presenting data in their papers.

The students were able to construct their search strategies well. For this course assignment, the approach was quite straightforward and facilitated by the use of the MESH subject headings. Students would easily be able to continue with their own searching with little aid from the librarian.

Conclusions

In drawing our conclusions, we focussed on the questions of the usefulness of online searching for this specific course assignment and on the importance of teaching online searching as a life-long research skill.

For this course assignment, the online searches appeared to be useful. The review of the paper bibliographies showed that some students were able to use online abstracts for articles in journals not in our library. The students reported being pleased with the searches and appreciated the time it saved them. On the other hand, online searching is clearly not necessary for successful literature retrieval and the preparation of a good paper for this course. All students were able to complete the assignment using the print version of Index Medicus and the students volunteered their own opinion that online searching was not essential. Faculty found no significant differences in paper quality according to use or non-use of online searching. The availability of abstracts for journal articles not in our library did not lead to a selection of many paper topics in areas not covered by the library's resources.

The students thought that online searching should be taught to every student in the bibliographic instruction program offered at Earlham. Because it was a fast and effective research technique (even though not necessarily essential for this course assignment), they believe that skill in online searching would serve them well in the future. Students, however, strongly support teaching the print versions of online resources. Some found it easier to understand online searching if they had seen the database in paper first. Most recognized that being able to search by hand or by computer would make them more versatile information gatherers.

After drawing these two general conclusions -- that online searching is a useful skill to teach, but not necessary for locating literature for this course assignment -- we wanted to assess whether we should offer online searching in the next Human Biology class. If there are benefits to teaching online searching as a life-long research skill, does it follow that we should teach it in this course? The overall cost of the project included not only the computer search time, but also the amount of librarian time spent in supervising the 60 student searches. We wondered whether librarian time might be better spent teaching and supervising online searching in courses for which the technique would make a more significant contribution to the retrieval of information. While the library would be willing to support online costs, we felt that continuation of the project would necessitate finding a more efficient way to teach and supervise the student searches.

We have been able to continue to work on this project. For the next year's Human Biology class, we made available a CD-ROM version of Index Medicus. We wanted to see if the continuous availability of CD-ROM versus online would ease the burden on the librarian and make it more convenient for the students, and to see if the opportunity to search repeatedly (without additional cost) would alter or improve the students's use of computerized literature retrieval. While the results of this project are still being reviewed, our preliminary assessment is that, in addition to the benefits of computerized searching found in the CLR project (fast information retrieval, abstracts of articles), the students also used the technique to "browse" and help select a topic. We plan to continue to experiment with the use of these computerized tools and to evaluate our progress in an effort to provide better information access for our students.