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Education for database intermediaries: how library schools have changed (and how they haven't)

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EDUCATION FOR DATABASE INTERMEDIARIES: HOW LIBRARY SCHOOLS HAVE CHANGED (AND HOW THEY HAVEN'T)

Do you remember what you learned about databases when you were in library school? If you graduated more than fifteen years ago, chances are you had no courses in database searching. By 1977, however, almost two-thirds of the accredited library schools offered at least one course in online searching [1] or incorporated online instruction into existing courses. If you graduated in the early 1980s almost all schools included some kind of online instruction in their curriculum [2] and some students had an opportunity to elect dedicated classes in online searching [3]. Those of you who graduated after 1985 probably had a different experience. Elective dedicated instruction in online searching has increased, but a higher percentage of students in the schools are now required to learn something about searching. Limited online time is now supplemented with CD-ROM databases and more specialized classes in advanced searching and database design. Database searching has become an accepted part of the library school curriculum in virtually all schools, with more opportunities for hands-on practice. The requirements, numbers of courses, and approach still varies, however.

Recently I surveyed accredited schools of library and information science in the United States and Canada to find out what types of database searching education the current students are receiving and to see how that has changed in the last five years. For many schools the patterns they began in the late 1970s and early 1980s are being followed (perhaps with refinements and improvements); for others there have been fundamental changes in their curricula that reflect new emphasis on databases.

METHODOLOGY

I sent surveys in 1988 (with follow-ups early in 1989) to all 60 of the ALA-accredited schools of library and information science in the United States and Canada that offer Master's degrees. The schools are listed in the Directory issue of the Journal of Education for Library and Information Science, (JELIS) [4] along with faculty members and their specializations. Although 189 faculty members (132 full time) in the 1987-1988 JELIS directory listed online searching as an area of specialization, I treated each school as a single entity.

Overall response rate was 88%, with all seven Canadian schools and 46 of the 53 U.S. schools responding. All of my figures and conclusions are based on this 88% (or the portion of the 88% that responded to any individual question). Of the seven schools that did not respond I don't think it is accurate to assume that they all do not offer any database searching in their curricula, although that may be true for some. For some, the survey was not answered because the database searching classes are taught by adjunct faculty or the database specialist listed in JELIS has moved to another school and the school is searching for a replacement. My questionnaire probably fell through the cracks in these cases.

The questionnaire asked about use of online, CD-ROM, and in-house database systems by the school, and how it has changed in the last five years. I was only interested in reference use of databases, so I asked respondents to omit information about online systems used for technical services instruction. I asked about specific classes, how many students received database exposure, and what products, systems, hardware, and software were in use. Finally, I asked each respondent to comment on their perceptions of changes in the database curriculum. (A copy of the questionnaire is available on request.) Findings are presented in two main sections: 1) courses offered and amount of database search time, and 2) products used.

COURSES AND SEARCH TIME

One of the main things I wanted to discover was how much database searching is offered by library schools today. There are two

main aspects to the issue of how much database searching. The first aspect concerns classes available in the curriculum for students to choose, including how many courses incorporate database information, what percent of each class is devoted to databases, and how many hours of hands-on experience is required in the class. The second aspect concerns how many of the students actually take these courses, or, as I asked, what percent of the current graduates receive exposure to database searching. The first aspect tells what the students who specialize in databases can select, the second tells how pervasive exposure to database searching is in the student body as a whole.

AMOUNT OF EXPOSURE

Figure 1 shows what percent of students receive hands-on exposure to online or CD-ROM databases before they graduate. In over 80% of the schools, three-quarters or more of the students get hands-on exposure to online searching. Approximately the same percent is exposed to CD-ROM databases. In over 40% of the schools all of the students get hands-on experience with online searching, and in 56% all of the students use CD-ROM. Only three of the schools responding to my survey indicated that less than a quarter of their students receive exposure to online, and only two indicated that less than a quarter are exposed to either online or CD-ROM. (Although I did not explicitly ask, from answers to other questions it is clear that all of the 53 schools that answered my survey offer some students some exposure to either CD-ROM or online searching or both.) In 34% of the schools there is 100% exposure to both CD-ROM and online. In Canadian schools this figure is 71%.

CD-ROM so far seems to offer an additional means of exposure to databases rather than a replacement for online, as can be seen in Figure 2. Although virtually all CD-ROM access was added since 1985, in only 6% of the schools has online exposure decreased in this period. In many schools (45%) online use has increased along with the increased use of CD-ROM. Several schools commented that they are switching basic database instruction to CD-ROM, but advanced work still requires the range of databases and systems available online.

The data on use of in-house database simulation systems is more difficult to interpret because so many respondents left those questions blank. I suspect that a blank in this case means they do not use in-house simulation systems, but I cannot be sure. Absolute numbers rather than percents are therefore more useful. Table 1 and Table 1A show that in 23 schools a quarter or more of the students are exposed to in-house simulation systems before they graduate. The use of simulators has increased since 1985 in 25 schools.

COURSEWORK

Not surprisingly, over 80% of the respondents who answered the question on courses indicated that there has been an increase in their number of courses that include exposure to databases. No one indicated a decrease.

Figure 3 shows how many required and elective courses that include database searching are offered by the schools. Eighty-two percent of the schools have at least one course that is 100% dedicated to online searching and 25% have more than one. (If I had used Harter and Fenichel's definition of a dedicated course as 84% or more devoted to searching, the percent of schools would be higher.) These dedicated courses are almost always electives; only 8% of the schools require a dedicated course in database searching. Courses that devote 50%-99% of the course to database searching are also more likely to be electives; only 15% of the schools require them. Required courses tend to fall more in the under 50% category, probably showing that although large percents of students who are now receiving their Master's in Library and Information Science are exposed to database searching their exposure is somewhat limited. This is what Harter and Fenichel called "consciousness raising" exposure [5].

Some schools offer only dedicated searching courses, a few offer only courses that incorporate searching with other topics, and many offer a dedicated course (or courses) in addition to some courses that incorporate searching with other topics. This variation in approach surfaced in earlier studies and has been a continuing debate in database education. Boyce described the several different models for online instruction that are common in schools of library and information science. Online searching may be incorporated into existing courses, it may be only covered in a separate course devoted entirely to searching online systems, or the school may combine both approaches [6]. Each has its own advantages and disadvantages and proponents.

Many respondents to my questionnaire commented that they have experienced a move toward integration in the last five years. Several schools are attempting to incorporate some database experience into all reference classes in the curriculum, where the content can be emphasized rather than the technology. This may represent a maturing of database instruction, where database services are treated as just another information resource rather than as something unique.

The lists of courses provided to me by the schools suggests a co-existence of the approaches. In many schools dedicated courses remain while some of their other courses incorporate database searching into their content. One respondent commented:

Electronic searching is being incorporated into other courses, both core (i.e., introduction to reference) and specialized subject bibliography courses (i.e., bibliography of medicine). Some even feel an online-specific course to be superfluous, but necessary given the limited time available in these other courses.

Another said:

Ideally we'd like to eliminate the necessity for a separate course in online searching. However, at present, adding enough in other courses to do so isn't feasible for two reasons: 1) current content that would have to be cut to make room for additional online instruction, and 2) additional fees students would be forced to pay for each class.

Many schools seem to be following the compromise approach so that a large percent of students at least get limited exposure to database searching, but dedicated classes are available for those who want to specialize in databases.

It is sometimes difficult to tell from course titles exactly what a course is about, but most seem to fit into the following categories: Beginning database searching, advanced database searching/subject specific databases, subject bibliography/reference, information science, library automation/data processing, and database management. Sample titles in each category are listed in Table 2. If you graduated 15 years or more ago you may have taken a course with the same title (i.e., Social Science Bibliography) but without the database component.

I also asked the schools in a separate question if they taught courses in areas that are related to database searching, but that go beyond teaching students how to search. Courses in computer programming, DBMS, database design, or the information industry are essential components in a curriculum that is meant to prepare database designers or creators, rather than just database consumers. In the tenth anniversary issue of ONLINE [7], I speculated that such emphases will be necessary to prepare future students in schools of library and information science to be leaders in all aspects of the information industry.

Figure 4 summarizes the responses to the related courses question. For all of the related courses I asked about, a majority of schools either offer dedicated courses or (more likely) incorporate information on the topic into another course. Database design is the most popular related course, with almost half of the schools offering a dedicated course. All but five schools (9.4%) at least incorporate it into other courses.

Respondents described other courses in their curricula that pertain to this extended view of databases or allow a specialization in databases. Most of these were added in the last five years and are dependent on an individual faculty member with a particular interest or viewpoint. Courses offered by at least one school and that expand the traditional curriculum include: Origins and Uses of Information for Databases, Interactive Systems Design, Information Marketing, Online Competitive Intelligence, Personal Information Systems.

PRODUCTS, HARDWARE, AND SOFTWARE

The courses offered and the number of students exposed to databases shows the extent that database information has been incorporated into the curricula of graduate schools and how it has increased in the last five years. I also asked some perhaps less important, but none-the-less interesting, questions about what specific products the schools use to accomplish their goals. This may be of interest to potential employers who are looking for employees with skills on specific systems, or to firms such as database producers and online systems to see which products are being used the most.

ONLINE SYSTEMS

As can be seen in Figure 5, DIALOG is used by every school that responded to this question.

Other online systems used by at least 10% of the respondents are listed in rank order. Schools were asked to mark all online systems they use, and many indicated more than one. Figure 6 shows that 10% of the schools use only one online system, while a majority use two or more. (This compares to 38% of schools that used only one system in 1980).[8] Most of the systems in use offer special low-cost instructional rates.

Even with an instructional rate of \$15 per hour, cost is a continuing factor in the amount of online time offered to students. Several respondents commented that their online budget has remained the same for five years, while the number of students desiring searching experience has increased. They provide this experience in different ways: creating local databases, purchasing databases that have a one-time cost, or relying on donations of CD-ROM databases. Although I did not ask about student fees, several respondents volunteered the information that fees for students have gone up; one school now charges \$400 per student. (The University of Hawaii, like many statesupported universities, cannot charge online lab fees.)

ONLINE HARDWARE AND SOFTWARE

There is more variety in the hardware and software that is used to access the online systems. Figure 7 shows, in rank order, what hardware is used most and Figure 8 ranks the software. (The packages labeled "Other" are all of those used by only one or two schools. They include some shareware packages, several Macintosh packages, and a variety of less popular communications packages.) That DIALOGLINK is so popular makes sense because the DIALOG system is used by so many. Most schools use more than one kind of hardware and have more than one piece of software for online searching. Figure 9 shows that 59% use three or more software packages and 53% use two or more types of computers or terminals. In an educational setting, learning about a variety of hardware and communications software is as much a part of the online searching experience as learning about the system and databases.

A major change in the last five years is the replacement of dumb terminals with microcomputers. Many respondents commented that using microcomputers for searching has allowed them to expand the topics covered in their classes to include such things as front end packages, downloading and post-processing, database design, and software evaluation. Most of the specialized database search software has been available for MS-DOS only, one of the reasons for the reliance on IBM or IBM-compatible equipment.

CD-ROM DATABASES

Many different CD-ROM databases are being used, but certain distributors and databases are in common use. In most cases this is

because all schools were given copies of the databases by the producers, a tactic that should pay off in the long run with new professionals who are accustomed to these products. Figure 10 shows, in rank order, the CD-ROM databases most used.

Bibliographic databases are most popular, particularly DIALOG's ERIC and the WILSONDISC demonstration disk that contains small portions of all H.W. Wilson CD-ROM databases. Other types of databases, especially directories and full text, are also used on CD-ROM, but to a lesser extent (at least for reference use). Again, the products that were given to the schools are not surprisingly the most common titles. This survey was completed before the R.R. Bowker Company gave Books In Print Plus and Ulrich's Plus to all accredited library schools and before EBSCO gave its Serials Directory. Many more products are being offered to schools, so these specific titles will continue to change.

CD-ROM use was started in 1986-1987 by most schools when the H.W. Wilson Company donated a workstation to each ALA-accredited school. Since that time many have added additional workstations and have embraced the use of CD-ROM enthusiastically. Many respondents commented on their work to incorporate CD-ROM database use in courses that before did not discuss databases and to encourage individual students to use the CD-ROMs on their own time. More workstations and more databases are desired, but budgets are limited. One respondent described her dream of incorporating database searching into all classes and ended "if only we could 'find' a lot more funds for equipment, CD-ROM might offer a partial solution."

CONCLUSIONS

How have things changed in library schools? Schools now have a variety of options that allow them to offer hands-on exposure to database searching. Online searching, in-house simulation systems, and CD-ROM databases provide students with varied experiences and more opportunity for practice. Database searching is being incorporated into many classes in the curriculum with future plans for more integration. Large percentages of students who receive the Master's in Library and Information Science degrees now at least have the opportunity for some hands-on experience.

CD-ROMs allow each student to have more hours of searching experience. One fortunate respondent told me:

Two years ago when I started this position there was very limited searching and no CDs. We now have about 40 CD disks and students have unlimited online searching on DIALOG and BRS. Online has gone from a specialized topic in one to two courses to an everyday tool used by all students in their courses. This is certainly the dream of many more schools.

The switch to microcomputers for online searching has provided the impetus for increased emphasis on software evaluation, post-processing, and database design. Innovative new courses in the curriculum show the increasing opportunities to specialize in the wider issues with electronic information sources.

How have things stayed the same? There still is much variety among schools in the number of classes and chances for specialization. Educators still can't agree as to the best approach: integration of database searching into other classes or separate database searching classes. One respondent commented that "It changes every semester. Keeping the courses abreast of technological developments is a constant battle -- but we try." In many instances the approach and specific courses are decided by a particular faculty member. Since most schools are small, if that faculty member leaves, the school's approach to database searching may change.

Finally, in most schools the dreams and plans of the faculty who teach these courses keep running up against realities of budget constraints. Increased demand for online time, students from other departments in the classes, costs of hardware and software, and on-going costs of CD-ROM databases keep many schools from realizing their ideals.

Still, one respondent summed it up for all schools in her concise response to the question "Please comment on how your database instruction has changed in the last five years." "It has got (sic) better." [Figures 1 to 10 Omitted] [Tabular Data 1, 1A and 2 Omitted]

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THE AUTHOR

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