

Research Notes

Identifying CD-ROM Use Patterns as a Tool for Evaluating User Instruction

Bruce A. Leach

Workstation sign-up records were used to determine use patterns for individuals searching CD-ROM databases in the Biological Sciences Library at The Ohio State University between January 1987 and June 1991. Data were gathered for the number of database uses, interval between first and last database use, and number of academic quarters in which databases were used. More than half the individuals recorded all use within one month. Over one-third recorded use on only one day. Results suggest that the library should emphasize basic point-of-use instruction for first-time searchers and de-emphasize workshops.



D-ROM databases have enjoyed such popularity that scheduling workstation use has been a necessity for most academic libraries. If carefully maintained, workstation sign-up records will yield information about CD-ROM use patterns (e.g., number of uses, use frequency) of individual database searchers. This information can serve as a basis for evaluating the instructional needs of the user group.

In the Biological Sciences Library at The Ohio State University, CD-ROM database use has increased 15 to 20 percent each year. Satisfying the resultant increase in demand for instruction and assistance has been a challenge. The insight gained by identifying CD-ROM use patterns has helped the library to

change the emphasis of user instruction and to make the most effective use of staff time. Considering the amount of resources devoted to CD-ROM user instruction in other libraries, this exercise may help other librarians when allocating scarce resources to various methods of instruction.¹

REVIEW OF THE LITERATURE

Few studies have examined the patterns of CD-ROM database use by individuals. Ann-Marie Bélanger and Sandra Hoffman examined demographic and other factors related to frequency of use of ERIC on CD-ROM. Their data on prior CD-ROM use were gathered via questionnaire.² Tim Bucknall and Rikki Mangrum conducted an electronic survey of users of fifteen different CD-ROM

databases mounted on a local area network. Level of experience (number of prior database uses) was a relatively small portion of the total study.³ Ann Nisto and others and Carlo Pedemonte and others described software for gathering statistics on database use by individuals, but neither presented data about their user groups.⁴ Several authors have described software for gathering statistics on database use by groups of searchers (faculty, graduate students, nonstudents, etc.).⁵ So far, no published studies have used workstation use records covering an extended period of time to determine patterns of CD-ROM database use by individuals.

The literature on user instruction for CD-ROM is voluminous. Among papers dealing with evaluation, many have measured user satisfaction or success after instruction.⁶ Others have used searcher responses to determine the appropriate content for instructional sessions and materials.⁷ The study by Bélanger and Hoffman suggests that data on CD-ROM use frequency by groups of students can be used to target workshops to their specific needs.⁸ Nevertheless, no published studies have used database use patterns as a basis for determining the emphasis of an instruction program.

BACKGROUND

The Biological Sciences Library is one of five life science libraries at Ohio State (the others are Agriculture, Health Sciences, Pharmacy, and Veterinary Medicine). The primary users of the library are 900 undergraduates, 325 graduate students, 100 staff, and 85 faculty from the College of Biological Sciences. Departments and programs served by the library include Biochemistry, Biotechnology, Biophysics, Entomology, Environmental Biology, Microbiology, MCDB (Molecular, Cellular, and Developmental Biology), Molecular Genetics, Plant Biology, and Zoology. The staff of the library includes one professional, three support staff, and two full-time equivalent (FTE) student assistants. All public service is offered from the circulation

desk; a separate reference desk is not maintained. The current CD-ROM subscriptions, *Aquatic Sciences and Fisheries Abstracts (ASFA)* and the *Life Sciences Collection (LSC)*, draw a few users from the Colleges of Agriculture, Medicine, and Engineering. Retrospective disks for *AGRICOLA (1970-78, 1979-84)* have received very little use because current subscriptions are available in other places on campus.

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ASFA and the *LSC* have been available in the library since January 1987; (*AGRICOLA* was added in February 1988). Demand for these databases was so great that within a week of their introduction, it became necessary to schedule workstation use. The practice continues today. Daily sign-up sheets are maintained on a clipboard at the circulation desk. These sheets divide the day into half-hour segments. Users are allowed to reserve two consecutive segments at a time. All workstation use is recorded in this way.

All but a very few of the first-time CD-ROM users request (or require) instruction. This impression is supported by the results of a survey of 103 first-time *ASFA* and *LSC* users in the Biological Sciences Library (conducted during the 1990-91 academic year), in which 85 percent of respondents indicated no previous CD-ROM experience.⁹

Before this project, all new CD-ROM users were actively encouraged (but not required) to attend a 30-45-minute workshop. Each workshop began with a few words of advice concerning the strengths and limitations of CD-ROM. The balance of each session covered database content, search strategy (including use of thesauri), simple Boolean logic, basic workstation "housekeeping" (handling disks, starting software, etc.), a demonstration of basic searching (including truncation and phrase searching),

displaying and printing/downloading citations, and a demonstration of all menu commands. Workshops were offered once or twice a week during most of the autumn, winter, and spring quarters. Only a small proportion of new database searchers attended.

Before September 1990, most new searchers received basic instruction through one-on-one contact with a library staff member. One-on-one instruction covered workstation "housekeeping," rudimentary search strategy (including the use of AND/OR), basic searching, and displaying/printing citations.

Previous experience teaching end-users to search a menu-driven online system suggested that most new searchers would not use handouts, preferring instead to ask library staff for assistance at each and every step of the search.

Beginning with the 1990-91 academic year, library staff had the option of directing first-time *ASFA* and *LSC* users to a brief computer-based tutorial produced in-house. The tutorial was intended to provide basic instruction in situations where library staff were unavailable for one-on-one instruction. It was composed of four sections: Search Strategy, Running Your Search, Displaying and Printing, and Changing Disks. Most users completed the tutorial in less than ten minutes. In 1990-91, it was used by over 40 percent of the first-time CD-ROM searchers surveyed.¹⁰

Instructional handouts ("cheat sheets") were not offered for basic instruction. Previous experience teaching end-users to search a menu-driven online system suggested that most new searchers would not use handouts, preferring instead to ask library staff for assistance at each and every step of the search.

PROBLEM TO BE STUDIED

After several years of teaching and assisting CD-ROM searchers, the library staff formed two impressions about da-

tabase use: (1) Most new searchers used the databases on one occasion (i.e., day) and never returned; (2) a small number of habitual searchers were responsible for most of the database use.

If these impressions were substantiated, then a re-evaluation of the library's user instruction program would be in order. Therefore, the purpose of this project was to determine the actual use patterns of individuals searching CD-ROM databases in the Biological Sciences Library.

To establish database use frequency for an individual, it is necessary to have data on the number of occasions the databases were used and the period of time over which use occurred. By including data that show how the database uses were distributed over the time examined (i.e., in how many quarters), a clearer pattern of database use emerges. Therefore, workstation sign-up records were examined to answer the following questions: (1) On how many occasions did each user search the CD-ROM databases? (2) Did CD-ROM use by each individual occur within a short period or over a long period of time? (3) Over how many academic quarters was the database use of each individual distributed?

METHODOLOGY

All of the available workstation sign-up sheets from January 1987 through June 1991 were used to obtain the names of database users. The data from each daily sheet (users' names and date) were entered into a text file using WordPerfect 5.1. Because library policy limits workstation reservations to two consecutive half-hour segments, database users who require more time to complete a search usually reserve two or more nonconsecutive blocks within the same day. To avoid hindering the identification of one-occasion users, multiple entries within the same day were reported as one use.

The completed list was printed, then edited to consolidate entries with variant forms of the same name. The final edited and sorted list contained 5,652 entries representing use by 1,501 individuals. The number of database uses, the number of academic quarters in which

the databases were used, and the interval between first and last database use were calculated for each individual. These figures were entered into a text file, then summarized and cross-tabulated using Minitab 8.2 statistical software.

RESULTS

Table 1 summarizes the number of database uses by individuals. Nearly 75 percent of those examined used the

TABLE 1
DATABASE USES

Database Uses	Number of Users	% of Total Users	Cumulative % of Total Users
1	586	39.0	39.0
2	270	18.0	57.0
3	155	10.3	67.3
4	112	7.5	74.8
5	84	5.6	80.4
6	60	4.0	84.4
7	46	3.1	87.5
8	26	1.7	89.2
9	36	2.4	91.6
10	29	1.9	93.5
11	17	1.1	94.6
12	18	1.2	95.8
13-80	62	4.1	99.9
Total	1,501	99.9	

Percentages rounded to nearest .1.

TABLE 2
INTERVAL BETWEEN FIRST AND
LAST USE IN MONTHS

Interval in Months (< or =)	Cumulative Number of Users	Cumulative % of Users
0	586	39.0
1	874	58.2
6	1,081	72.0
12	1,217	81.1
18	1,320	87.9
24	1,387	92.4
30	1,430	95.3
36	1,452	96.7
42	1,480	98.6
48	1,494	99.5
53	1,501	100.0

Percentages rounded to nearest .1.

databases on four or fewer occasions. This is not surprising, since 39 percent of the total group recorded use on only one day. At the other extreme, about 4 percent of the total group used the databases on more than twelve occasions.

Table 2 summarizes the number of months between individuals' first and last database use. Nearly 97 percent of the individuals observed recorded all database use within 36 months. More than half (over 58 percent) recorded all use within one month.

Table 3 summarizes the number of academic quarters in which the databases were used by individuals. All but a few (over 95 percent) used the databases in five or fewer quarters. More than half (59 percent) of the individuals recorded all use within one quarter.

DISCUSSION

Before drawing any conclusions, it would be helpful to use some observations about the user group to determine if the results are within the limits of reason. The user group was composed of students, a handful of faculty/staff, and a few visitors from off-campus. As workstation sign-up records contained only the name of each user, data identifying the academic status and major of each individual were not readily available.

TABLE 3
NUMBER OF ACADEMIC
QUARTERS DATABASES USED

Number of Quarters	Number of Users	% of Total Users	Cumulative % of Total Users
1	886	59.0	59.0
2	269	18.0	77.0
3	146	9.7	86.7
4	83	5.5	92.2
5	44	2.9	95.1
6	20	1.3	96.4
7	17	1.1	97.5
8	9	.6	98.1
9	13	.9	99.0
10	6	.4	99.4
11-17	8	.5	99.9
Totals	1,501	99.9	

Percentages rounded to nearest .1.

However, results of the 1990-91 survey of first-time ASFA and LSC users in the Biological Sciences Library suggest that among CD-ROM users, undergraduates outnumber graduate students by a ratio of two to one.¹¹ For this project, it is reasonable to assume that the use patterns of undergraduate CD-ROM users had the greatest influence on the results.

For many users of CD-ROM in the Biological Sciences Library, database searching was a skill developed only for the short term.

Depending upon their majors, undergraduate students in the College of Biological Sciences at Ohio State are required to complete between two and five biology courses with significant writing assignments. Most of these writing assignments require library research. Because the courses with writing components have prerequisites, very few students enroll in them before their sophomore year. Since all but a few undergraduates take courses in three of the four academic quarters per year, it is reasonable to assume that all but a very few of the undergraduate CD-ROM users would record their database use in nine or fewer academic quarters (records for this project spanned eighteen quarters). Since library research is required in only a few courses, it is likely that all but a few recorded their database

use in five or fewer quarters. Therefore, it is also logical that all but a few of the undergraduate CD-ROM users recorded their use within thirty-six months.

Graduate students use the literature throughout the course of their programs, which average from two to six years. Knowing this, we may surmise that some graduate students recorded database use in most or all of the quarters (and months) covered by workstation sign-up records.

Considering these factors with the results of the 1990-91 survey, it comes as no surprise that nearly 97 percent of the individuals in the total user group recorded all database use within thirty-six months or that over 95 percent recorded all use in five or fewer academic quarters.

CONCLUSIONS

Based on the data, some use patterns emerge. Table 4 summarizes the groups of database users identified.

For many users of CD-ROM in the Biological Sciences Library, database searching was a skill developed only for the short term. More than half the observed individuals recorded all database use within a single month. More than one-third recorded use on only one occasion. These short-term users accounted for less than one-quarter of all the database use reported in this project. Although this pattern falls short of confirming the initial impression of the library staff (that most users searched the database on only one occasion), it is important.

TABLE 4
DATABASE USE PATTERNS

	Short-term Searchers	"Typical" Searchers	Habitual Searchers	Infrequent Occasional Searchers
Percentage of users	58	33	4	4
Percentage of use	24	50	20	7
Interval (months)	≤ 1	> 1 < 24	≥ 24	≥ 24
Number of quarters	1	2-5	≥ 6	≤ 5
Number of uses (range)	1-7	2-25	7-80	2-16

Percentages rounded to the nearest 1%.

At the other extreme, a few (about 4 percent) of the observed individuals recorded database use in six or more quarters over a period of twenty-four months or more. These habitual database searchers accounted for about 20 percent of all reported database use. This pattern does not confirm the impression that a small number of habitual searchers accounted for most of the database use.

Another 4 percent of searchers recorded database use in five or fewer quarters over a period of twenty-four months or more. These infrequent searchers accounted for about 7 percent of all reported database use. Many of them recorded single uses (or clusters of use) separated by long periods of time.

The remaining one-third of the observed individuals used the databases in two to five quarters over a period of less than twenty-four months. This group of "typical" searchers accounted for half of all reported database use.

IMPLICATIONS FOR USER INSTRUCTION

If the patterns of database use observed in this project continue, what do they suggest about the instruction that should be offered to new database searchers? Since over half of all new searchers will become short-term database users, it is reasonable to offer them only the most basic instruction before their first search. Basic instruction should continue to emphasize workstation "housekeeping" (handling disks,

starting software, etc.), simple strategy formation, searching, displaying, printing, and nothing more.

As small changes in the searching software occur regularly, individuals who identify themselves as infrequent occasional CD-ROM users should be treated like new searchers when they seek to reinforce their skills. In-depth instruction (i.e., workshops) should continue to be offered. However, it should be recommended only for those who wish to develop more sophisticated searching skills. Workshops should be thorough, but they should consume only a small portion of the staff time available for user instruction and assistance.

In response to the patterns of CD-ROM use observed in this project, the emphasis of our instructional program was adjusted. Workshops were still offered, but they were not promoted aggressively. The number of scheduled workshops was reduced by one-half. Until August 1993 (when it was outdated by the conversion of the ASFA and LSC databases to SilverPlatter software), most first-time database users were directed to the computer-based tutorial. As one-on-one instruction has always been an important part of the program, more time was spent training and updating the library staff.

Overall, the knowledge gained by identifying patterns of CD-ROM use has helped the library to make the most effective use of limited resources. Libraries in similar circumstances may also find this exercise to be worth the effort.

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