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ABSTRACT

This study attempted to determine if the type of training that CD-ROM patrons received had an effect on the satisfaction level of their search results by use of the survey method. Kent State University students, faculty, and patrons who used CD-ROM databases for information retrieval were asked to complete a one page (front and back) questionnaire regarding their opinions on end user searching training methods and satisfaction levels. The two main methods of instruction, formal and informal, were measured for their effectiveness on the satisfaction levels of CD-ROM searching. The study found that, overall, formal training was not significantly related to users' satisfaction levels but it is still a vital part of CD-ROM instruction today. The questionnaire and cover letter are appended. (Author/DLS)

END USER SATISFACTION:
A USER STUDY OF THE CD-ROM DATABASES AT KENT STATE UNIVERSITY

A Master's Research Paper submitted to the
Kent State University School of Library and Information Science
in partial fulfillment of the requirements
for the degree Master of Library and Information Science

by

Leela E. Balraj

July, 1994

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CHAPTER I. INTRODUCTION

A rapidly emerging technology within the library world is the advent of CD-ROM (compact disk - read only memory) databases. Many of these databases allow users to search for citations and abstracts to journal articles, chapters in books, documents, dissertations on specific topics in a wide array of disciplines, and numerous statistical and financial data. Library patrons' responses to these databases have been overwhelmingly positive.

Librarians today must be able to evaluate these patrons' positive (and negative) reactions to CD-ROM products to determine how best to assist them with their search needs and strategies. Patrons who use CD-ROM databases have different levels of searching expertise, thus they may also require different types of search assistance. A beginning level searcher will need to learn the basics such as using keywords as search terms, combining search terms, and how to print or download citations or abstracts. Intermediate level searchers may need to know how to combine old search term results with a new search, how to use the database's index or thesaurus, or how to truncate search terms. Advanced searchers may want to know how to limit their search by certain fields such as language, year of publication, author, journal title, or descriptors.

There are various methods in assisting these patrons in

using CD-ROM databases at a university setting. Two methods of CD-ROM instruction include formal training and informal training methods. Formal training methods include instruction by a library staff member and instruction in a class or workshop setting. Informal training methods include online help screens, online tutorials, library guides, and CD-ROM database manuals. Patrons may also learn how to use the databases informally through self instruction or by a friend, classmate, or colleague.

Statement of the Problem

Librarians must assess their patrons' information needs and satisfaction levels of CD-ROM searching. They must formulate an effective method of CD-ROM instruction that is both beneficial to the patron and economical for the library. To do this they must first determine if their current method or methods of instruction are effective in teaching their patrons how to successfully use a CD-ROM database.

The literature on CD-ROM database instruction and CD-ROM end users is overwelming but there is a void in the literature on determining the satisfaction levels of these users. This may be due in part to the difficulty in assessing satisfaction levels and also librarians' percieved beliefs that patrons are generally satisfied with their search results. More research in this area is needed to be able to better determine what types of training, formal, informal, or a combination of both types, are needed to

best serve the libraries' CD-ROM users.

Purpose of the Study

This study focuses on the CD-ROM databases located at the Kent State University Main Library. The library's local area network offers over thirty CD-ROM databases in the reference center of the library. These databases cover a wide span of disciplines which include ABI/Inform and Compact Disclosure for business related information, MEDLINE and CINAHL for medical related information, Statistical Masterfile for statistical information, and ERIC for education related information, to name just a few.

The purpose of this study is to determine if the type of training has an effect on the success/satisfaction level of CD-ROM searching by end users, that is, the library patrons. The two main types of training, formal and informal, will be measured for their effectiveness on the success or satisfaction levels of CD-ROM searching.

Definitions of Terms

Boolean searching: Combining terms or sets with "OR" (broadens a search), or with "AND" or "NOT" (narrows a search) in most electronic databases.[1]

CD-ROM: 1. A plastic disk with a reflective metal coating which is read by a small laster beam. Linked to personal computers CD-ROMs have rapidly become a major publishing medium for distributing databases, directories, and catalogs.[2] 2. CD-ROMs enable access to journal articles or book chapters through the use of keywords,

subjects, and other information in a library setting. A CD-ROM database is usually limited to a broad subject area. For example, CINAHL is a nursing related database and PsycLIT is a psychology related database. CD-ROMs are also more resistant to scratches and warping than other storage media and have a greater storage capacity.[3]

End User: A person who ulimately desires, receives, and uses any information which is provided through an interactive retrieval system, such as a CD-ROM. The information retrieved may be acquired directly by the end user or indirectly through the use of an intermediary.[4] The term "end user" in this paper will always refer to a direct end user without the use of an intermediary unless otherwise stated. Hereafter, when the term "user" or "searcher" is used in context with CD-ROMS it will always refer to an end user.

Keyword: Any search term used in an electronic database such as a name, controlled vocabulary term, free text (i.e. natural language) term, or a special code or number.[5]

Limitations of the Study

This study is limited to CD-ROM users at the Kent State University Main Library; thus the findings may not necessarily apply to all CD-ROM users, such as younger or older users, and in all settings, such as public libraries or smaller academic libraries.

CHAPTER II. LITERATURE REVIEW

Since the advent of the commercial use of CD-ROMs in 1986[6] there has been a phenomenal growth in this area of electronic access to bibliographic information in the library world. There are over 949 CD-ROM databases available today with an average subscription price of $1,846.[7]

There has also been a tremendous amount of growth in the literature on CD-ROM products and users, and also on surveys and studies conducted on their use. This paper includes literature searches from various CD-ROM databases including LISA, Library Literature, ABI/Inform, and Periodical Abstracts from 1986 to 1994 for relevant research articles. Several online Dialog databases were also searched including ERIC (File 1) from 1966 to the present, Social Scisearch (File 7) from 1972 to the present, ABI/Inform (File 15) from 1971 to the present, and LISA (File 61) from 1969 to the present. Search terms included "CD-ROM," "end user," "satisfaction," "database," "training," "instruction," "formal," "informal," "research," "study," and "survey". CATALYST, Kent State University's online public access catalog, was also used to find relevant sources on electronic databases and online catalogs.

Steffey and Meyer conducted an important study at Vanderbilt University's Heard Libraries which attempted to evaluate user success and satisfaction with CD-ROMs. They

found that the majority of users surveyed (72%) preferred instruction from library staff. They also found that users who had classroom instruction reported a higher degree of satisfaction with the number of citations retrieved and also placed a greater amount of value on their search results.[8]

Culbertson used a program called Total Recall to record keystrokes of actual searches conducted on CD-ROMs by patrons at the Colorado State University Libraries. His findings also indicated that some type of formal instruction should be a high priority for library staff offering CD-ROM searching to their patrons.[9]

Schultz and Salomon also conducted a study on how end users respond to CD-ROMs. Contrary to the previously mentioned studies, this study revealed that only 36 percent of the students surveyed felt that instruction by a librarian is needed before successfully using CD-ROMs. A reason for the discrepency between this study and the other studies may be due to the relatively small sample size of only forty-two students at Oakland University. Despite this finding, Schultz and Salomon still felt that librarians must develop effective methods of CD-ROM instruction, either in bibliographic instruction classes or by one-on-one instruction, to better understand what the information needs of end users are.[10]

Johnson and Rosen stated that information needs and search satisfaction may be very different to the end user than to the librarian. Thus librarians must focus not only

on the results of the patrons' search, but also on the process of information retrieval. They felt that the goal of the library staff should be to teach a process so end users can use these skills to effectively meet future information needs.[11]

Barbuto and Cevallos conducted a study at Hofstra University's Axinn Library. They found that although there was a high degree of user satisfaction with their CD-ROM databases, users still did not, to any significant degree, use advanced searching techniques emphasized in formal training sessions. Their study concluded that modifications of formal training methods are constantly required to help develop better and more effective instructional techniques to aid end users with their search needs and strategies.[12]

Research done at the University of Illinois at Urbana-Champaign by Allen found that although most patrons stated that they did not feel training was required in the use of CD-ROMS, they also felt that they were unsure if they successfully retrieved relevant citations to their search.[13] This finding suggests that libraries may need to provide training in developing search strategies and also in database selection which, in turn, may improve patrons' success rates in retrieving relevant citations. Along the same lines, Lo Bue, at the University of Colorado's Norlin Library, stated that training end users involves both the mechanics of searching and the logic of searching.[14] This not only includes knowing how to use boolean logic but also

learning how to select appropriate terminology, thinking about how to structure one's search, and knowing when to stop refining one's search.

An extensive user study of the CD-ROM service at the University of North Carolina at Chapel Hill by Bucknall and Mangrum attempted to assess their CD-ROM system's success and to provide the library staff with information to help evaluate and improve their service to CD-ROM users. Their study found that when training end users on search strategies, library staff must be able to respond to both the fundamental mechanics of searching of first time users and also to the more advanced logic related questions posed by intermediate and advanced searchers. They also felt that library staff should take into account that most users prefer to consult library staff only when they need additional help.[15] Thus libraries should also provide library guides and online help at CD-ROM terminals to better serve those patrons who choose to conduct their search primarily on their own.

Grant and Stalker also noted some considerations of formal and informal training encountered at the Thomas P. O'Neill, Jr. Library at Boston College. Most of their end user training involves point-of-use instruction by the library staff. Due to differing levels of activity at the reference desk this instruction can be very brief (three or four minutes) or quite lengthy (ten to fifteen minutes). As a supplement to their formal instruction, a general quick

reference guide, various database specific search instruction handouts, keyboard reference templates, and online tutorials are all available to aid patrons with their search strategy. The library also offers formal class instruction on CD-ROM searching either at the workstation area using hands-on demonstrations and handouts if the class is small or in the classroom using a videotape on CD-ROM searching and handouts if the class is too large for a hands-on demonstration. Patrons can also schedule individual appointments with librarians for subject specific CD-ROM training sessions.[16]

An important informal method of CD-ROM instruction is the library's own CD-ROM users' guides. Maxymuk, at the Temple University Library, stated that to provide an effective user's guide, each individual database's guide should follow the same logical outline. Some important points to include are what the database's coverage includes, basic search commands, how to form a search strategy, how to view results, how to print or download results, what the searchable fields are, and other important database specific features.[17] A succinct guide gives users something of their own which they can refer back to whenever they wish or when library staff are unavailable to assist them. Worrell, of the Appalachian State University Library, also emphasized that librarians must encourage patrons to use these guides to help them to search independently and to ask for individual help only when they need it.[18]

Another informal method of CD-ROM instruction discussed in the literature is the less popular online tutorials, produced either by CD-ROM vendors or by the library's own staff. Leach conducted a study at the Biological Sciences Library at the Ohio State University and found that respondents who were taught by a library staff member found the CD-ROM easier to use than those who used the library's inhouse online tutorial. Although the survey results indicated that online tutorial instruction may not be appropriate for every user, it has still proven to be a valuable supplement to the library's overall CD-ROM instruction program.[19]

Finally, two highly unstructured informal methods of instruction discussed in the literature include self taught instruction and instruction by a friend, classmate, or colleague. Sichel stated that some users prefer to explore CD-ROM databases on their own by trial and error or may have familiarity with other automated retrieval systems.[20] LePoer and Mularski found that only nine percent of the CD-ROM users surveyed at the Health Sciences Library at the Ohio State University said they learned how to use its MEDLINE database through a friend or colleague. Their findings also indicated that very few users (13%) were able to formulate totally efficient searches.[21] These two statistics only reinforce the fact that end users miss relevant information due to a lack of formal training on CD-ROM database searching.

Dyson and Carey stated that the CD-ROM revolution is changing the nature of patron-librarian interactions. Their study found that CD-ROMs are now an integral part of students' research patterns and that how libraries (and librarians) deal with this reality will have a profound impact on their instructional services for training end users on CD-ROM searching.[22] This, in turn, will have a direct impact on the satisfaction levels of CD-ROM users.

CHAPTER III. METHODOLOGY

This paper used the survey method to record the responses of CD-ROM patrons after they completed a search on any one of the library's CD-ROM databases. To accomplish this, a one page questionnaire (front and back) was distributed in the electronic resources area of the Kent State University Reference Center during a three month period from April to July of 1994. A cover letter explaining the study in further detail was also placed by each of the questionnaires' distribution points (see Appendix A).

This questionnaire will attempt to evaluate end users' satisfaction levels of CD-ROM searching by asking them how they learned to use the database which they were currently using, what their preferred method of instruction for CD-ROM instruction is, what they think is the most effective method of instruction for CD-ROM searching, and if they think some kind of formal training is necessary to effectively use the database (see Appendix B).

The questionnaire also asks the user what their gender is, what their status is, and what their major or department is to get a flavor for the type of patrons that are using the CD-ROM databases. Users are also asked if they prefer CD-ROM searching over using print indexes, if they would use CD-ROMs again for future research, and also if they would recommend using CD-ROMs to a friend or colleague to

determine if patrons like CD-ROM searching regardless of their satisfaction level of their current search. Patrons are also asked to list any comments or suggestions they may have on improving CD-ROM searching to see what they want improved or added to better serve their needs (see Appendix B).

The questionnaires were placed beside CD-ROM terminals in the electronic resources area of the reference center. Patrons were either asked to complete a survey by a library staff member or they filled one out on their own initiative. Also, after a patron exited a database an automatic pop up screen which instructed patrons to fill out a survey was displayed for a few seconds before returning to the main menu screen. All questionnaires were collected anonymously at the reference desk and all responses were kept confidential.

CHAPTER IV. RESEARCH RESULTS

A total of 278 questionnaires was collected from CD-ROM users which included only five unusable respones. Unusable surveys were due to either completion of only one side of the questionnaire or the respondent used nonsense words. The usable response rate was 98.2%.

Users were asked several demographic questions to determine what type of patrons were using the CD-ROM databases. Slightly over two thirds (67.2%) of the respondents were females and the status of most users were

Table 1

Demographic Characteristics of End Users

Characteristic	N=273	f	%
Gender			
	Male	89	32.8
	Female	182	67.2
	Total	271	100.0
Status			
	Undergraduate	112	41.0
	Graduate	131	48.0
	Faculty	12	4.4
	Staff	4	1.5
	Other	14	5.1
	Total	273	100.0
College/School			
	Arts and Sciences	99	39.4
	Business	30	12.0
	Education	46	18.3
	Fine and Professional Arts	52	20.7
	Nursing	21	8.4
	Undecided	3	1.2
	Total	251	100.0

either undergraduate (41.0%) or graduate (48.0%) students. Most of the respondents who indicated "other" for their status (14 or 5.1% of all users) were local Kent residents not affiliated with the university. The College of Arts and Sciences accounted for 39.4% of all the different majors and departments listed by respondents. This may have been due in part to the large number of databases concentrated in this area such as SOCIOFILE, PsycLIT, GeoRef, PAIS International, and MLA International Bibliography (see Table 1).

The four most popular databases selected by users for their searches included ERIC, the education related database (21.8%), PsycLIT, the psychology related database (16.6%), Periodical Abstracts, the general interest database (13.3%), and MLA International Bibliography (11.1%). Also, almost half (49.1%) of all users said they used the database which they selected for their current search more than ten times (see Table 2). This large percentage of repeat users helps demonstrate the immense popularity of CD-ROM database searching which is prevelant today.

Over half (54.8%) of all users stated that they had used CD-ROM databases other than the one they were currently using (see Table 2). This percentage may have been even larger due to the extra step which asked users to list up to three different databases which they had used previously. This added step may have discouraged respondents from indicating that they had used other CD-ROM

databases in the past.

Table 2

CD-ROM Database Selection and Usage Frequencies

Characteristic N=273	f	%
CD-ROM Database Selected		
Periodical Abstracts	36	13.3
ERIC	59	21.8
MEDLINE	20	7.4
ABI/Inform	19	7.0
PAIS International	3	1.1
CINAHL	18	6.6
Compact Disclosure	8	3.0
PsycLIT	45	16.6
GeoRef	3	1.1
Statistical Masterfile	2	0.7
SOCIOFILE	17	6.3
MLA International Bibliography	30	11.1
Other	11	4.1
Total	271	100.0
Frequency of CD-ROM Database Usage		
First time	46	16.8
Two to Ten times	93	34.1
More than Ten times	134	49.1
Total	273	100.0
Used Other CD-ROM Database Before		
Yes	149	54.8
No	123	45.2
Total	272	100.0

The purpose of more than half (56.4%) of users' searches were conducted for a research paper or project. The next most popular reason was research for a thesis or dissertation (15.0%), followed closely by a class assignment (12.8%). The large percentage of graduate and undergraduate users (89.0%) probably accounts for these findings. Also, 31.9% of the respondents stated that they used more than one

database for their search while 68.1% only searched the database which they were currently using (see Table 3).

Out of the 273 respondents, 221 (81.0%) said they used keywords to conduct their current search. Seventy-seven (28.2%) of all users used boolean operators to refine their searches while only 19 (7.0%) of all respondents stated that they used truncation to refine their searches. Over one fourth (25.3%) of all users searched specifically by author. A small number of searchers used more

Table 3

CD-ROM Database Search Purpose and Characteristics

Characteristic N=273	f	%
Purpose of Current Search		
Research Paper or Project	154	56.4
Class Assignment	35	12.8
Thesis or Dissertation	41	15.0
Writing an Article or Book	14	5.1
Other	29	10.6
Total	273	100.0
Used Other CD-ROM Database(s) for Current Search		
Yes	87	31.9
No	186	68.1
Total	273	100.0
How Current Search was Conducted		
Keywords	221	81.0
Journal Title	23	8.4
Author	69	25.3
Year	33	12.1
Article Title	49	17.9
Descriptors	38	13.9
Boolean Operators	77	28.2
Truncation	19	7.0
Database Thesaurus	21	7.7
Database Index	19	7.0
Other	8	2.9

sophisticated searching techniques including searching by descriptors (13.9%), using the database's thesaurus (7.7%), or using the database's index (7.0%). Most (six out of eight or 75%) of the "other" category respones referred to subject searches (see Table 3).

The majority (38.8%) of all respondents learned to use the CD-ROM database informally through self instruction. The next most popular method of instruction was formal

Table 4

CD-ROM Database Searching Instruction Methods

Type of Instruction N=273	f	%
How User Learned to use Current Database		
Formal Training Methods		
Library Staff	87	31.9
Class or Workshop	26	9.5
Formal Training Total	113	41.4
Informal Training Methods		
Friend, Classmate, or Colleague	20	7.3
Self Taught	106	38.8
Online Help Screens or Online Tutorial	14	5.1
Library Guide or Manual	11	4.0
Informal Training Total	151	55.2
Other	9	3.3
Total	273	100.0
User's Preferred Method of Instruction		
Formal Training Methods		
Library Staff	108	40.9
Class or Workshop	31	11.7
Formal Training Total	139	52.6
Informal Training Methods		
Friend, Classmate, or Colleague	22	8.3
Self Taught	46	17.4
Online Help Screens or Online Tutorial	34	12.9
Library Guide or Manual	20	7.6
Informal Training Total	122	46.2
Other	3	1.1
Total	264	100.0

training by library staff (31.9%). More than half (55.2%) of users learned to use the CD-ROM databases informally while 41.4% of all users learned mainly by formal instruction. Informal training methods include self instruction, instruction by a friend, classmate or colleague, through online help screens or tutorials, or by using a CD-ROM library guide or manual. Formal training methods include instruction by library staff or in a class or workshop setting (see Table 4).

The two most preferred methods of CD-ROM instruction were in reverse order of the two most popular methods of instruction actually used. The majority (40.9%) of all users stated that their preferred method of instruction was formal training by library staff. The next most popular preferred method of instruction was informally through self instruction (17.4%). The total formal versus total informal preferred methods of instruction were also in reverse order of the total formal versus total informal actual methods of instruction used to learn the CD-ROM databases. A total of 52.6% of all users preferred formal training methods while 46.2% preferred informal methods of instruction for CD-ROM searching (see Table 4).

Users felt that the most effective method of CD-ROM instruction was overwhelmingly by formal training methods. Almost half (46.0%) of all users believed that instruction by library staff and 21.3% believed that instruction in a class or workshop were the most effective methods of

training CD-ROM users. This accounted for over two thirds (67.3%) of all users while only one third (32.7%) felt that informal training methods were the most effective ways to train CD-ROM users. Not surprisingly, over half (58.6%) of all users felt that formal training was useful to effectively search CD-ROM databases. A smaller percentage (11.7%) felt that formal instruction was essential to effectively search CD-ROM databases while 29.7% of all users felt formal training was not necessary (see Table 5).

Table 5

Effective CD-ROM Database Instruction Methods

User's Perception N=273	f	%
User's Perception of Most Effective Method of Instruction		
Formal Training Methods		
Library Staff	121	46.0
Class or Workshop	56	21.3
Formal Training Total	177	67.3
Informal Training Methods		
Friend, Classmate, or Colleague	19	7.2
Self Taught	15	5.7
Online Help Screens or Online Tutorial	37	14.1
Library Guide or Manual	15	5.7
Informal Training Total	86	32.7
Other	0	0.0
Total	263	100.0
User's Perception of Formal Training needed to Effectively Search CD-ROMs		
Essential	32	11.7
Useful	160	58.6
Not Necessary	81	29.7
Total	273	100.0

About half (44.5%) of all users rated CD-ROM searching easy with almost the same percentage of users (46.0%) rating it either very easy or somewhat easy to use. Almost all of the respondents were either very satisfied (50.9%) or somewhat satisfied (40.2%) with the number of citations they retrieved. Also, over one third (67.6%) of all users said that the CD-ROM search which they conducted was very valuable to their overall research. On the other end of the spectrum, only 9.5% of users said that CD-ROM searching was somewhat to very difficult, only 8.9% were somewhat or very

Table 6

CD-ROM Database Searching Ease and Satisfaction Rates

Rating N=273	f	%
CD-ROM Searching Ease/Difficulty		
Very Easy	59	21.7
Easy	121	44.5
Somewhat Easy	66	24.3
Somewhat Difficult	18	6.6
Difficult	3	1.1
Very Difficult	5	1.8
Total	272	100.0
Satisfaction with Number of Citations Retrieved		
Very Satisfied	138	50.9
Somewhat Satisfied	109	40.2
Somewhat Unsatisfied	14	5.2
Very Unsatisfied	10	3.7
Total	271	100.0
Value of Current Search to Overall Research		
Very Valuable	184	67.6
Somewhat Valuable	79	29.0
Not Valuable	9	3.3
Total	272	100.0

unsatisfied with the citations they retrieved, and only 3.3% said that the search which they conducted was not valuable to their overall research (see Table 6).

The majority (35.7%) of all users spent between 15 to 29 minutes on their search, followed by 25.0% who spent between 30 to 59 minutes on their current search. When asked approximately how much time they would have spent on their current search if they did not have access to the CD-ROM databases almost half (47.9%) of the respondents said they would have spent approximately one to five hours on their search. Some of the users indicated that it would

Table 7

Approximate Search Times

Time	N=273	f	%
Approximate Time spent on Current CD-ROM Search			
	Less than 15 minutes	56	20.6
	Between 15 to 29 minutes	97	35.7
	Between 30 to 59 minutes	68	25.0
	Between One to Two hours	39	14.3
	More than Two hours	12	4.4
	Total	272	100.0
Approximate Time would have spent on Current Search without access to CD-ROMs			
	Less than One hour	21	8.2
	Between One to Five hours	123	47.9
	Between Six to Ten hours	21	8.2
	Between 11 to 24 hours	16	6.2
	Between One to Seven days	22	8.6
	More than One week	4	1.6
	Same/Equivalent time	6	2.3
	Forever/Long time	31	12.1
	No Idea/Unknown Amount of time	13	5.1
	Total	257	100.0

have take them forever or a "looooong" time (one user's terminology!) (12.1%) and others indicated that they literally had no idea (5.1%) how long their search would have taken without the use of the CD-ROM databases. Also, only six (2.3%) of the respondents said it would take them the same or equivalent amount of time on their search if they did not have access to CD-ROM searching (see Table 7).

When asked if users had ever used the print version of the CD-ROM database which they were currently searching more than half (54.0%) stated that they had also used the print version. Almost one third (31.6%) said they had never used the comparable print index to their CD-ROM database while 14.3% stated that they did not know if they had used it or not. Over three fourths (77.7%) of all users said they preferred CD-ROM searching to using print indexes while a mere 3.1% stated that they preferred print indexes over

Table 8

CD-ROM Databases Versus Print Indexes

Search Medium N=273	f	%
Use of Comparable Print Index		
Yes	147	45.0
No	86	31.6
Don't know	39	14.3
Total	272	100.0
Search Medium Preference		
Prefer CD-ROM	199	77.7
Prefer Print Index	8	3.1
No Preference	49	19.1
Total	256	100.0

CD-ROMs. About one fifth (19.1%) of the respondents had no preference between using CD-ROMs or print indexes (see Table 8).

Three fourths (75.3%) of all users said that they would use CD-ROM databases again for future research. Remarkably, not even one of the respondents said that they would never use CD-ROMs again for future research and only 2.6% said they didn't know if they would use it or not. Almost ninety percent (89.3%) of all users stated that they would highly recommend CD-ROMs to their friends or colleagues while less than one percent (0.7%) said they would not recommend it to a friend or colleague (see Table 9).

Table 9

Future Use and Recommendation of CD-ROM Searching

Characteristic N=273	f	%
Use CD-ROMs Again for Future Research		
Always	204	75.3
Often	49	18.1
Sometimes	11	4.1
Never	0	0.0
Don't know	7	2.6
Total	271	100.0
Recommend CD-ROMs to Friend or Colleague		
Highly Recommend	243	89.3
Recommend with Some Reservations	27	9.9
Wouldn't Recommend	2	0.7
Total	272	100.0

A chi square analysis indicated that how patrons learned to use the CD-ROM database was significantly related to their preferred method of instruction (see Table 10).

Table 10

Chi Square Analysis of the Relationship between Preferred Method of Instruction by How Patron Learned to Use Database

	Preferred Method of Instruction							
How Learned	1	2	3	4	5	6	7	Total
Database	%	%	%	%	%	%	%	%
Formal								
Library Staff	23.5	1.9	1.5	2.3	1.5	0.0	0.4	31.1
Class or Workshop	2.7	5.3	.4	.8	.4	0.0	0.0	9.5
Informal								
Friend, Classmate, Colleague	2.7	.8	2.7	.4	.8	0.0	0.0	7.2
Self Taught	9.9	3.0	3.4	13.3	5.7	4.8	0.0	39.4
Online help screens or tutorial	1.1	0.0	.4	0.0	3.0	.8	0.0	5.3
Library guide/ manual	.4	.4	0.0	.8	.4	2.8	0.0	4.8
Other	.8	.4	0.0	0.0	1.1	.4	.8	3.4
Total	40.9	11.7	8.3	17.4	12.9	7.6	1.1	100.0

Chi square value = 244.177
p = 0.00
Sample size = 264
Degrees of freedom = 36

Key: 1 = Library staff
2 = Class or workshop
3 = Friend, classmate, or colleague
4 = Self taught
5 = Online help screens or online tutorial
6 = Library guide or manual
7 = Other

Another chi square analysis indicated that how patrons learned to use the CD-ROM database was significantly related to the method of instruction which they perceived to be the most effective (see Table 11).

The next chi square analysis showed that how patrons learned to use the CD-ROM database was significantly related to their preference that formal training is needed to effectively use CD-ROMs (see Table 12). Less than one fifth (18.7%) of the formally trained users felt formal training was not necessary to effectively search a CD-ROM database while almost two fifths (37.7%) of the informally trained users felt that formal training was not necessary.

The chi square analysis of how patrons learned to use the CD-ROM database by how satisfied they were with their search results (chi square = 11.694; p = 0.863) indicated that 93.8% of all formally trained users were satisfied with their search results while 88.7% of all informally trained users were satisfied with their search results. These results showed that there was not a significant difference between the satisfaction levels of formally and informally trained users although the formally trained users had a higher satisfaction rate than the informally trained users.

Table 11

Chi Square Analysis of the Relationship between Method of Instruction Perceived Most Effective and How Patron Learned to Use Database

How Learned Database	Method of Instruction Perceived Most Effective 1 %	2 %	3 %	4 %	5 %	6 %	7 %	Total
Formal								
Library Staff	21.3	5.7	1.5	0.4	2.7	0.4	0.0	31.9
Class or Workshop	2.7	5.7	0.8	0.4	0.0	0.0	0.0	9.5
Informal								
Friend, Classmate, Colleague	4.2	0.8	0.4	0.0	1.1	0.0	0.0	6.5
Self Taught	12.9	8.0	3.8	3.8	8.0	2.7	0.0	39.2
Online help screens or tutorial	1.1	0.4	0.8	0.4	1.1	1.5	0.0	5.3
Library guide/ manual	2.3	0.4	0.0	0.0	0.8	0.8	0.0	4.2
Other	1.5	0.4	0.0	0.8	0.4	0.4	0.0	3.4
Total	46.0	21.3	7.2	5.7	14.1	5.7	0.0	100.0

Chi square value = 85.227
p = 0.00
Sample size = 263
Degrees of freedom = 30

Key: 1 = Library staff
2 = Class or workshop
3 = Friend, classmate, or colleague
4 = Self taught
5 = Online help screens or online tutorial
6 = Library guide or manual
7 = Other

Table 12

Chi Square Analysis of the Relationship between Formal Training Needed to Effectively use CD-ROMs and How Patron Learned to Use Database

How Learned Database	Formal Training Needed to Effectively use CD-ROMs: Essential f	Essential %	Useful f	Useful %	Not Necessary f	Not Necessary %	Total f	Total %
Formal								
Library Staff	14	5.1	55	20.2	18	6.6	87	31.9
Class or Workshop	6	2.2	17	6.2	3	1.1	26	9.5
Informal								
Friend, Classmate, Colleague	1	0.4	13	4.8	6	2.2	20	7.3
Self Taught	9	3.3	58	21.3	39	14.3	106	38.8
Online Help Screens or Tutorial	1	0.4	8	2.9	5	1.8	14	5.1
Library Guide or Manual	0	0.0	4	1.5	7	2.6	11	4.0
Other	1	0.4	5	1.8	3	1.1	9	3.3
Total	32	11.7	160	58.6	81	29.7	273	100.0

Chi square value = 20.965
p = 0.051
Sample size = 273
Degrees of freedom = 12

CHAPTER V. CONCLUSION

This study attempted to determine if the type of training that CD-ROM patrons received had an effect on the success/satisfaction level of their search results. The two main types of instruction, formal and infomal, were measured for their effectiveness on the satisfaction levels of CD-ROM searching. Users completed a one page (front and back) questionnaire regarding their opinions on end user searching training methods and satisfaction levels. The usable surveys were then analyzed by using the SAS statistical program.

The survey results concluded that there was not a significant relationship between the satisfaction levels of formally trained users' search results and informally trained users' search results. Formally trained users included those instructed by library staff or in a class or workshop. Informally trained users included those who learned to use the database on their own, by a friend, classmate or colleague, through online help screens or online tutorials, or by a CD-ROM library guide or manual.

CD-ROM users also indicated that they felt that the most effective method of instruction was by formal training methods over informal training methods. Of all the training methods, users felt that instructon by library staff was the most effective method.

Regardless of training methods, an overwelming 96.6% of

all users felt that their current search was either very valubale or somewhat valuable to their overall research. Only 3.3% felt that their search was not valuable to their overall research. Also, 77.7% of all users preferred CD-ROM databases to comparable print indexes while only 3.1% preferred the print index over the CD-ROM database. This indicates that users place a large emphasis on their CD-ROM searches over other search mediums.

Finally, 93.4% of all users stated that they would use CD-ROMs again for future research either always or often and 89.3% said they would highly recommend CD-ROMs to a friend or colleague. This reinforces the trend towards electronic database information retrieval, especially through CD-ROM searhing by end users.

Libraries today should provide both formal and informal methods of CD-ROM instruction for their patrons. Although chi square analysis indicated that formal training is not significantly related to users' satisfaction levels it is still a vital part of CD-ROM instruction. Librarians should encourage patrons to search independently by using informal methods of instruction and use formal instruction by the library staff as a supplement to their searching needs.

APPENDIX A

School of Library and Information Science
(216) 672-2782
Fax 216-672-7965

Kent STATE UNIVERSITY
P. O. Box 5190, Kent, Ohio 44242-0001

Re: END USER SATISFACTION: A USER STUDY OF THE CD-ROM DATABASES AT KENT STATE UNIVERSITY

April 11, 1994

Dear CD-ROM User:

I am a graduate student in the School of Library and Information Science at Kent State University. As part of the requirements for my master's degree I am conducting a study about the satisfaction levels of CD-ROM users at Kent State. This questionnaire elicits information that will help me to discern which type of end-user training, formal or informal, is more effective in obtaining useful or valuable information.

Confidentiality and anonymity are guaranteed as you do not need to sign your name to the questionnaire. Only the investigator has access to the survey data. There is no penalty of any kind if you should choose not to participate in this study or if you withdraw from participation at any time. While your cooperation is essential to the success of this study, it is, of course, entirely voluntary. A copy of the results of this study will be available upon request.

If you have any further questions, please contact me at (216) 291-4264 or Dr. Lois Buttlar, my research advisor, at (216) 672-2782, If you have any further questions regarding research at Kent State University you may contact Dr. Eugene Wenninger, Office of Research and Sponsored Programs, at (216) 672-2851.

Thank you very much for your time and cooperation. Please place your completed questionnaire on tray marked COMPLETED CD-ROM SURVEYS at the reference desk or give it to a reference librarian.

Sincerely,

Leela E. Balraj

Leela E. Balraj
Graduate Student

APPENDIX B

END USER SATISFACTION:
A USER STUDY OF THE CD-ROM DATABASES AT KENT STATE UNIVERSITY

SURVEY FORM

1. What is your sex? [ ] Male [ ] Female

2. What is your status? [ ] Undergraduate [ ] Graduate
   [ ] Faculty [ ] Staff [ ] Other (please specify) _____

3. What is your major/department? _____

4. Which CD-ROM database are you using **NOW**? (check ONE)
   [ ] PERIODICAL ABSTRACTS [ ] ERIC [ ] MEDLINE
   [ ] ABI/Inform [ ] PAIS International [ ] CINAHL
   [ ] Compact Disclosure [ ] PsycLIT [ ] GeoRef
   [ ] Statistical Masterfile [ ] SOCIOFILE [ ] MLA International Bibliography
   [ ] Other (please specify) _____

5. How often have you used **THIS** database? (check ONE)
   [ ] First time [ ] Two to ten times [ ] More than ten times

6. How did you learn to use **THIS** database? (check the ONE that MOST applies)
   [ ] Library staff
   [ ] Friend, Classmate or Colleague
   [ ] Online help screens or Online tutorial
   [ ] Class or Workshop
   [ ] Library Guide or Manual
   [ ] Self taught
   [ ] Other (please specify) _____

7. Using the options in question 6, which is your **PREFERRED** method of instruction for CD-ROM searching? (list ONE option from question 6)

   _____

8. Using the options in question 6 again, which do you think is the **MOST EFFECTIVE** method of instruction for CD-ROM searching (list ONE option from question 6)

   _____

9. Do you think some kind of **FORMAL** training (i.e. librarian, workshop) is necessary to **EFFECTIVELY** use a CD-ROM database? (check ONE)
   [ ] Essential [ ] Useful [ ] Not Necessary

10. Have you ever used any other CD-ROM database before?
    [ ] No
    [ ] Yes (please specify up to three databases you have used previously NOT including the one you are currently using)

    _____

    _____

    _____

11. What is the purpose of your **CURRENT** search? (check ONE)
    [ ] Research paper or project
    [ ] Class assignment
    [ ] Thesis or dissertation
    [ ] Writing an article or book
    [ ] Other (please specify) _____

(OVER PLEASE)

12. Do you plan to use, or have you used any other search methods for THIS particular research? (check ALL that apply)
[ ] CATALYST (KSU online catalog)
[ ] Print index
[ ] Other CD-ROM database(s)
[ ] Online search
[ ] Reference librarian
[ ] Other (please specify) _____

13. How did you conduct your CURRENT search? (check ALL that apply)
[ ] By Keyword(s) [ ] By Journal title
[ ] By Author [ ] By Year
[ ] By Title [ ] By Descriptors
[ ] Used Boolean operators (i.e. 'and', 'or', or 'not')
[ ] Used Truncation (i.e. 'vot*' or 'vot?' for vote, votes, voting, etc)
[ ] Used database's Thesaurus
[ ] Used database's Index
[ ] Other (please specify) _____

14. How would you rate the ease/difficulty of THIS database (check ONE)
[ ] Very Easy [ ] Somewhat Difficult
[ ] Easy [ ] Difficult
[ ] Somewhat Easy [ ] Very Difficult

15. Were you satisfied with the number of citations you retrieved (printed/downloaded/wrote down) during your CURRENT search? (check ONE)
[ ] Very Satisfied [ ] Somewhat Unsatisfied
[ ] Somewhat Satisfied [ ] Very Unsatisfied

16. How would you rate the value of THIS search to your OVERALL research? (check one)
[ ] Very Valuable [ ] Somewhat Valuable [ ] Not Valuable

17. Approximately how much time did you spend on THIS search? (check ONE)
[ ] Less than 15 minutes [ ] Between One to Two hours
[ ] Between 15 to 29 minutes [ ] More than Two hours
[ ] Between 30 to 59 minutes

18. Approximately how much time do you think you would have spent on THIS search if you did not have access to CD-ROM searching? (please specify approximate time below)

_____

19. Have you ever used the PRINT version of this index? (check ONE)
[ ] Yes [ ] No [ ] Don't know

20. Do you prefer CD-ROM searching to using print indexes? (check ONE)
[ ] Prefer CD-ROM [ ] Prefer Print Index [ ] No Preference

21. Would you use CD-ROMs again for future research? (check ONE)
[ ] Always [ ] Never
[ ] Often [ ] Don't know
[ ] Sometimes

22. Would you recommend using CD-ROMs to a friend or colleague? (check ONE)
[ ] Highly recommend
[ ] Recommend with some reservations
[ ] Wouldn't recommend

THANK YOU for taking the time to complete this survey. **ALL ANSWERS ARE CONFIDENTIAL.** Please list any **COMMENTS** or **SUGGESTIONS** you may have on improving CD-ROM database searching below. Please place completed survey on tray at reference desk or give to a reference librarian. Thank you.

END NOTES

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