Research Notes

Use of a
Laser Videodisc System:
Attitudes

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Twenty-six students enrolled in a course on swine production retrieved information from a laser videodisc containing the full text of the Pork Industry Handbook. *The attitudes of these novice searchers were assessed before and after they used the laser videodisc system. The degree of expertise on computers appears related to the initial attitude toward retrieving information from the laser videodisc system. However, neither expertise on computers nor initial attitudes determined success in using the system. A larger, though not significant, change in attitude was seen between those who were successful in using the system and those who were not.*

Although laser videodisc technology has been available since the early seventies, librarians have only recently used it for information retrieval. Since 1981, when Pergamon introduced its short-lived Patsearch, several commercial applications of videodisc technology have become available. Major libraries including the National Library of Canada, the National Library of Medicine, the Library of Congress, and the National Agricultural Library have explored the capabilities of the laser videodisc.[1]

This study concerns one group of users who helped evaluate the effectiveness of laser videodisc technology and other technologies in retrieving information. In 1984 the National Agricultural Library (NAL) initiated the project in which these users participated.[2] The vehicle for the project was the full text of the *Pork Industry Handbook* in three formats: hard copy, full text available online from a private file at Bibliographic Retrieval Services, and full text on laser videodisc. The NAL project provided an opportunity to study the attitudes of novice users toward the laser videodisc system.

In evaluating the usefulness of the laser videodisc or any other technology, how the user feels about the system is an important consideration. How readily a potential user accepts and utilizes a new technology may depend upon the attitude toward it. At least some designers of computers and software are aware of this.

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Since the midseventies the decrease in computer costs has stimulated interest in good human factors as a marketing tool.[3]

Librarians also are aware of the importance of user attitudes as factors in accepting new technologies. Noble and O'Connor studied the relationship between attitudes toward computer technology in general and acceptance and evaluation of the VTLS online public access catalog (OPAC) in particular.[4] Analysis of their data indicated "that those who distrust and are suspicious of the computer technology would have less use for OPAC in the future."[5]

Some studies have indicated that computer experience may condition attitudes toward computers. In studying the attitudes of four professional groups, Zoltan and Chapanis observed that those who had learned to use computers held a more favorable attitude toward them than those who had not.[6] Arndt, Feltes, and Hanak found that secretaries familiar with word-processing equipment felt more positive toward using it than those who had had no experience with it.[7]

The objectives of this research were to examine (1) whether or not experience with computers affects attitudes toward the laser videodisc technology; (2) whether or not initial attitudes toward the laser videodisc system or experience on computers are related to user performance on the system; and (3) whether or not performance on the system is related to subsequent attitudes or increases in change of attitudes toward the technology.

METHODOLOGY

Twenty-six students enrolled in an eight-week class on swine production at Purdue University participated voluntarily in this study. A homogeneous group, all were farmers and all but one were under twenty-five years of age. The attitudes of the students toward retrieving information from the laser videodisc were measured before and after using the system.

The vehicle for measuring attitudes was a set of ten semantic differential scales (see Appendix A). A scale consists of an adjective and its antonym with seven blanks inserted between them. Scales for this study were selected from a list by Henerson, Morriss, and Fitz-Gibbon.[8] A mean attitude score was computed over all items for each individual.

The hardware of the system consists of an IBM PC-XT with 512 kilobytes of memory with monitor and mono-adapter card, a Pioneer LDV-1000 videodisc player, a Laser Data Trio 110 controller with interface card and a Panasonic TR124 monochrome display monitor. The software is the PCIX operating system and BRS/Search.

The data stored on the videodisc was the full text, plus pictures and charts, of the *Pork Industry Handbook*, approximately two million characters. The *Handbook* is a major reference work for those involved in raising and selling swine.

The searchable data (which includes all of the text, some of the charts, and all captions for pictures and graphs) are displayed on one monitor; the pictures, graphs, and remaining charts are displayed on the second monitor. BRS/Search enables searching in three modes. The participants in this study used the mode for novice users. Called Searchmate, it is menu-driven and has help screens that can be called up during a search session. The user may combine search terms with positional AND/OR Boolean operators. After the documents are retrieved, the user has different options for displaying them. Andre has described fully the creation, operation, and capabilities of this laser videodisc system.[9]

Each participant spent no more than one-and-a-half hours learning about and using the system. After reading a one-page description about what he was going to do during the session, he filled out the attitude scales to indicate how he felt in anticipating use of the system. I demonstrated how to retrieve documents from the system and how to display them. I also indicated written instructions on the search process located beside the computer. After the demonstration the participant was left to use the system on his own to find information on any topic he wished. After this period of exploration, I gave the student this question to answer: "What are the space requirements for

boars in pasture?'' The student had up to thirty minutes to find the answer, which was contained in a chart, and show it to me.

In this study there were two measures of performance. The first was success in answering the question. (A participant either found the answer or did not. If during the search he asked for help, he was counted as not having answered the question.) The second measure was the amount of time elapsed between submission of the question and discovery of the answer. After this part of the session, the student filled in the same set of attitude scales as he had before as a measure of his feeling toward using the laser videodisc system. Each student was asked what instruction he had received in using computers and how many hours he used one. His experience using a computer was given the value of 1, 2, or 3, corresponding to a low, moderate, or high level. A student with no computer courses or with a course but no application was rated as

having a low level of experience; one with multiple courses and no application or one course with minimal application was rated as having a moderate level of experience; one who used a computer on a regular basis was rated as having a high level of experience.

RESULTS AND DISCUSSION

A relationship does appear between users' previous experience on computers and their initial attitudes toward using the laser videodisc system (see table 1). For this part of the study the data were complete for twenty-four of the twenty-six students. A simple regression analysis of this data[10] showed for three of the ten scales and for the mean score of all scales a significant difference between the attitudes of those who had had more experience and those who had had less. One might expect that familiarity with a computer would foster a positive attitude toward a system with a microcomputer as a major component. In studying the attitudes of certified

TABLE 1

RELATIONSHIP OF PRIOR COMPUTER EXPERIENCE TO INITIAL
ATTITUDE TOWARD USING LASER VIDEODISC SYSTEM AS REPORTED IN PRETEST

Semantic Differential Scale	R Square	Adjusted R Square	Regression Coefficent	F	P
Boring/ interesting	.04127	− .00231	− .203145	.94697	.3411
Uninformative/ informative	.19005	.15324	− .435944	5.16222	.0332*
Confusing/ clear	.05643	.01354	− .237553	1.31574	.2637
Purposeless/ purposeful	.00917	− .03587	− .095766	.20363	.6562
Tense/ relaxed	.03797	− .00576	− .194861	.86833	.3615
Unhappy/ happy	.33667	.30652	− .580233	11.16603	.0030*
Angry/ calm	.12258	.08269	− .350110	3.07343	.0935
Worthless/ valuable	.04112	− .00246	− .202783	.94346	.3419
Useless/ useful	.26370	.23023	− .513514	7.87898	.0103*
Unfriendly/ friendly	.06511	.02261	− .255164	1.53214	.2288
Mean score of all scales	.20382	.16763	− .451468	5.63206	.0268*

Simple regression analysis of data used: $y = a + bx + e$ with initial attitude as y, the dependent variable, and prior computer experience as x, the independent variable.
df1/22
*$p < .05$.

public accountants, lawyers, and physicians, Zoltan and Chapanis found that experienced users were more likely to be positive toward computers than inexperienced users[11] But in this study of attitudes toward the laser videodisc system those who had had more experience using a computer had less positive attitudes in anticipating their use of the system than those who had had less experience. It is possible that a study with more participants would have had a different result. The number of students with the highest level of experience was four, and those with a moderate level was five.

The attitudes users held initially toward using the system did not appear to be related to their performance on the system. The data for this part of the study were complete for twenty-four of the students. One measure of performance was whether or not they were successful in answering the question. Eighteen (70 percent) of the twenty-six students did answer the question, although the

demonstration and exploration periods were brief, only one-half hour each. However, from a simple regression analysis of the data no relationship appeared between initially held attitudes and success in answering the question.

The other measure of performance was the time it took to answer the question. According to a simple regression analysis of the data there appears to be no relationship between the initial attitudes of the users and this measure. This is not unexpected. Other factors probably affected this measure of performance. Five of the students mentioned that they did not know how to type. This may have increased their search time for an answer. One can also speculate that the ability to formulate and execute a search might be a significant factor in determining performance and might operate independently of attitude. This ability might also be independent of previous experience on computers. A simple regression analysis of the level of experience with computers in rela-

TABLE 2
SUCCESS IN ANSWERING THE QUESTION USING LASER VIDEODISC SYSTEM RELATED TO CHANGE IN ATTITUDE

Semantic Differential Scale	Not Successful		Successful			
	Mean Difference in Scores	n	Mean Difference in Scores	n	F	p
Boring/ interesting	.88	8	.56	18	.4626	.5029
Uninformative/ informative	.50	8	1.00	18	.7224	.4038
Confusing/ clear	1.14	7	.67	18	.3251	.5741
Purposeless/ purposeful	.50	8	.56	18	.0168	.8980
Tense/ relaxed	.62	8	.83	18	.0553	.8161
Unhappy/ happy	.75	8	.82	17	.0125	.9118
Angry/ calm	.00	8	.56	18	.7020	.4104
Worthless/ valuable	.12	8	.44	18	.5357	.4713
Useless/ useful	.62	8	.72	18	.0265	.8721
Unfriendly/ friendly	-.12	8	.06	18	.1281	.7235
Mean score of all scales	.50	7	.62	17	.0890	.7683

Analysis of variance used. Success in answering the question is the independent variable. Difference between posttest and pretest scores on attitude scales measures change of attitude, the dependent variable. df 1/24 except 1/23 for confusing/clear and mean score of all scales.

tion to performance on the laser videodisc system indicated that experience did not appear to be related to success in answering the question or the time required to answer the question.

An analysis of variance revealed that for eight of the ten scales and for the mean of all scales those who were successful in answering the question showed a more positive change in attitude than those who did not answer the question, where change in attitude is measured by subtracting the pretest response from the posttest response for each respondent on each scale. (see table 2). However, the change in attitude was not significant.

CONCLUSION

Because of the small number of students comprising the total number of participants in this study and the even smaller number belonging to the subgroups, conclusions drawn from the analysis of the data are tentative. This study indicates that previous experience on computers is related to initial attitudes toward the laser videodisc system, although not in the direction one might expect. It is not evident from this study that as more library users become computer users one can expect them to have favorable attitudes initially toward new technology involving computers. However, neither initial attitudes toward the system, nor previous experience on computers appear to be related to how successful people are in using the system. These findings suggest that factors other than initial attitudes or experience with computers are more important in predicting success in using the laser videodisc system. In this study typing ability may have been a factor. Probably more important is knowing how to execute a search. One would hope that successful use of the system to retrieve information would encourage a positive attitude toward this technology. This cannot be concluded definitely from the data. However, those who were successful in answering the question did show a more positive change in attitude than those who were unsuccessful.

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APPENDIX A: SEMANTIC DIFFERENTIAL SCALES

PORK INDUSTRY HANDBOOK

How do you feel about finding information using this system? Place
an x on one of the seven lines between each pair of words.

boring	__	__	__	__	__	__	__	interesting
uninformative	__	__	__	__	__	__	__	informative
confusing	__	__	__	__	__	__	__	clear
purposeless	__	__	__	__	__	__	__	purposeful
tense	__	__	__	__	__	__	__	relaxed
unhappy	__	__	__	__	__	__	__	happy
angry	__	__	__	__	__	__	__	calm
worthless	__	__	__	__	__	__	__	valuable
useless	__	__	__	__	__	__	__	useful
unfriendly	__	__	__	__	__	__	__	friendly