

ALA Carroll Preston Baber Research Grant

Report

High School Students' Use of Databases:

Results of a National Delphi Study [neuman]

by Delia Neuman

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Annual, c. 1995)*

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Online and CD-ROM databases continue to proliferate in school library media centers, but little is known about how to design these tools as vehicles for learning, as well as for access and retrieval. Similarly, little is known about how to design curriculum and instruction to enhance students' opportunities to learn from and with these powerful resources. This project, which was funded by American Library Association's 1991 Carroll Preston Baber Research Grant, was aimed at 1) identifying students' most significant difficulties in using online and CD-ROM databases, 2) suggesting design elements and curricular and instructional strategies for making these tools more valuable

as learning resources, and 3) determining the most significant policy issues related to the use of electronic information resources in schools.

Methodology

The project methodology consisted of a four-round Delphi study with a panel of 25 media specialists from 22 high schools across the United States. The Delphi methodology provided a vehicle for these experts in using electronic information resources with students to reach a consensus about which of 230 statements describe priorities in this area for researchers, vendors, and library media specialists. The statements themselves were derived from two foundational case studies.¹ Through the four rounds of the study, panelists 1) rated all 230 statements on five-point Likert-like scales and 2) identified and ranked a 61-item subset of these statements as the ones they considered "most important."

Means and standard deviations for the Likert-like items were calculated to determine their rankings within the five major categories addressed through the Delphi instruments (problems, design solutions, curricular solutions, instructional solutions, and policy issues). Rankings of the "most important" statements within the categories were determined by analyzing panelists' scores for those items: statements with a preponderance of high scores emerged as highly ranked on their respective lists. Though some anomalies surfaced in the comparison of the two types of data (mean-based rankings and overt rankings), in general, the two data sets, in general, corroborated one another.

Results

Findings include five tables (based on final means achieved through the Likert-like ratings) and five lists (based on panelists' rankings of the subset of items) of prioritized problems, potential solutions, and major policy issues. Amalgamating the findings from both kinds of data yielded the following insights, which are illustrative of the full findings of the study.²

Chief among students' problems in using electronic information resources are generating search terms, designing effective search strategies, and overcoming mismatches between personal ideas of how information is organized and how information is actually organized in databases. Priorities for design solutions that might alleviate students' problems are using standardized terminology, incorporating mechanisms for automatically broadening and narrowing searches, and increasing the prominence of directions and prompts students must follow to find information. Among the most important curriculum topics

for students to master are understanding the general natures of research and of searching, understanding criteria for judging the value of citations, and designing effective search strategies. Among the most potentially effective instructional strategies for delivering these topics are individualized, hands-on instruction, collaborative library media specialist/student searching, and peer tutoring. The most important among the policy issues related to using these resources in schools are goals and priorities related to mastering the higher-order skills required for research, gaining familiarity with database uses and technology, introducing all students (including special-needs students) to CD-ROM databases, and enabling students to search CD-ROM databases independently.

Recommendations

The study findings include a wealth of details related to each of its five focal areas. It also confirms that the major issues related to schools' use of online and CD-ROM databases involves their role in students' development of the higher-order thinking skills necessary to plan, design, and conduct competent and credible research in the electronic information age. The number of highly rated and ranked statements dealing with the CD-ROM environment suggests that panelists believe this particular technology to be increasingly important for a high school audience.

The study's findings yield a variety of recommendations for ways in which researchers, vendors, and library media specialists can help students become effective users of electronic information resources. Again, the following examples are illustrative rather than exhaustive. Researchers should continue to explore ways in which the organization of knowledge in databases' organization of knowledge can be made more accessible to novices. Vendors should address ways to reduce the mechanical demands of using a plethora of resources so that students can focus on the nature and uses of the information that the resources provide. Library media specialists should continue to focus on higher-level research skills, integrating the intricacies and implications of this new technological environment as they pertain to individual subject areas.

Notes

1. Delia Neuman, "Designing Databases as Tools for Higher-Level Learning: Insights from Instructional Systems Design," *Educational Technology Research and Development* 41 (winter 1993): 25-46; Delia Neuman, *High School Students' Use of Databases: Implications from Instructional Systems Design* (College Park: University of Maryland, College of Library and Information Services, Technical Report, 1994): 94-102.

2. Delia Neuman, *High School Students' Use of Databases: Implications from Instructional Systems Design* (College Park: University of Maryland, College of Library and Information Services, Technical Report, 1994): 94-102; Delia Neuman, "High School Students' Use of Databases: Results of a National Delphi Study," *Journal of the American Society for Information Science* 46 (May 1995)