

Children's Information Search Process on the Internet: A Quantitative Perspective

Findings Abstract

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1. Research Background and Research Questions

The Internet provides a great opportunity for children to obtain information for problem solving, inquiry, and critical thinking. Research that examines children's information seeking on the Internet is still lacking. This research is built upon on a recently finished project funded by RCET (Research Center for Educational Technology). In that project, the following two questions were addressed largely using a qualitative method:

- How do children search and select information on the Internet?
- What problems do children encounter when seeking electronic information on the Internet?

With the large amount of raw data gathered from that study, a quantitative method would be possible and helpful to reveal a comprehensive view of children's Internet information searches. The major goals and research questions of this study are:

- This study aims to provide a detailed picture of children's Internet search process, such as search moves, search strategies, search techniques used, and sources used for the searches.
- Because the raw data were gathered over an extended time period from students in different grade levels and about searches on various search tasks, this study also examines whether children's Internet search processes vary by these variables. The results help illustrate how children's information seeking process changes as they acquire more techniques and how children at different grade level differ in their Internet searching behavior.

2. Methodology

2.1 Subjects

Since this study is a quantitative addition to the qualitative study that had been finished earlier, the subjects were the same for this study, that is, two groups of students (19 third-grade students and 24 fifth-grade students), who came to the Ameritech Electronic Classroom for regular class sessions for two hours on a daily basis for seven weeks in the spring 2001. The class sessions involved intensive Internet searches as part of the curriculum.

2.2 Data Collection

Raw data had been gathered in forms of screen captures, observational videotapes, and interview transcripts. While the finished qualitative study emphasized on the observation and interview data where screen captures were reviewed for interviews to better understand search moves, this study explores the screen capture data quantitatively.

In particular, the following steps were followed for the data collection:

- First, the researcher developed a protocol or data coding sheet to gather data from screen captures.
- Second, the researcher and research assistants collected data using the coding sheet and coding guidelines. Microsoft Access database was used for data entry. All codes are available in a pull-down menu for data entry so that codes could be selected rather than entered to avoid possible typing errors.

3 Findings Summary

The results of this study reveal that students extensively go back and forth to track the sites they previously visited. In fact, backtracking appears to be the most frequent search moves (23.7%) among all search moves during the students' search processes. The actual search activities only count toward 12.2% of the total moves during the search process. At the same time, students spend quite amount of their efforts (17.9%) on such moves as 1) to start or close an application; 2) to switch between applications; 3) to copy, paste, or print information they have located; and 4) to perform other window operations (e.g., resize windows, move windows, minimize or maximize windows etc.).

The search pattern identified in this study is hardly a perfect logical pattern of a search process, which starts at launching a web browser, then going to a source, conducting a search, evaluating and selecting a site from retrieved ones, evaluating a selected site, and finally using information

selected. The pattern of search sequences reveals that the search process is far beyond a linear sequential process, and is rather iterative. While backtracking is used at each stage during the search process, there are many repeating/looping activities at various stage of the search process, e.g., going to a source to start a search, engaging in a continuous search, selecting sites, and using the information selected. This shows that the Internet search process is much more complex than looking for information in the traditional library setting. Classroom teachers need to be aware of this highly interactive and demanding nature of Internet searches and prepare the students for the challenges.

Search engines appear to be the major source for students' Internet searches. This study provides evidence that students would use more other sources, such as a known website that is likely to contain useful information on a given topic, online dictionaries and encyclopedia, for their searches as they gain more Internet search experience. However, students still lack an understanding of the functionality of different search engines and which source is more effective than another for a particular search task. For example, many typed a question query in search engines that do not support natural language searching. Many used search engines looking for a definition. It would be beneficial to share, discuss, and compare various sources in class so that students may start their search in a right direction.

Since the subjects in this study include both third- and fifth-grade students, it is possible to compare the search behaviors of the two groups. In general, the fifth graders conduct more effective searches as they have few backtracking moves but more actual search moves, they are more selective in choosing sites retrieved, and they are more effective in gathering and using information retrieved using browsers and other applications. In addition, the fifth graders less depend on search engines to find information they need. They have better ideas regarding where to look for information and which source is more effective for a particular search task.

It appears that students grasp the basic search strategies and search techniques fairly easily and quickly. However, their Internet-searching skills are found to be lacking. Sophisticated search techniques, such as using Boolean operators, searching within categories, and combining searching and browsing, are barely used. In addition, there is a lot room to refine their search moves. There are some unnecessary moves, such as close and re-launch a web browser for a search, go all the way back to the homepage of the same search engine for another search, repeatedly open and close applications in use instead of having them open and switching back and forth between them, and so on. Evidently, for an effective Internet search, these supporting computer skills are important to carry the process from the beginning to the final use of the information retrieved. Such supporting skills identified in this study include: find, launch, and close an application; resize an application window; switch between different windows; copy and paste between applications; understand the concept of a file and folder; understand the structure

of a file system; locate a file in the file system; and save their work in a specified location in the file system.