Does Domain Knowledge Influence Search Stopping Behavior?

Maureen Dostert
School of Information and Library Science
University of North Carolina
Chapel Hill, NC USA 27599-3360
dostert@email.unc.edu

ABSTRACT
This research study investigated whether users’ level of domain knowledge influenced their decision to stop information searches. Stopping behavior was investigated using a convenience sample of 15 third- and fourth-year undergraduate students at a large university. Subjects completed a series of self-assessments about background information and levels of knowledge regarding four search domains. Subjects completed search tasks in four search domains and task times were measured. Tasks were counterbalanced among subjects. Subjects completed questionnaires about search experiences and reasons for stopping and participated in exit interviews. The study results indicated: (1) No association between knowledge level and stopping behavior (task times); (2) Positive correlation between levels of domain knowledge and levels of domain interest; (3) Positive correlation between satisfaction with the search process and the retrieved results; and (4) Negative correlation between satisfaction with search results and task times.

Keywords
Stopping behavior, user study, decision-making

INTRODUCTION
This proposal explores if a relationship may exist between domain expertise and search stopping behavior. Research about search behavior suggests that domain expertise may influence how people search for information. However, little empirical research exists on whether domain (knowledge) expertise may influence why users decide to end information searches. The research question asks, does domain knowledge influence search stopping behavior?

Researchers approach the study of search stopping behavior from various perspectives (e.g. triggers and cognitive stopping rules). Some question whether a predictive nature to stopping behavior exists. Others discuss cost-benefit analyses, role theory, and good enough information as the basis for decisions about stopping searches. Brown et al. (2007), Toms et al. (2009), and Zachs (2004) investigate reasons that trigger cognitive stopping rules users employ to end information searches. Brown et al. (2007) define cognitive stopping rules as “A heuristic people invoke to make judgments about sufficiency” (2007, pg. 90). Sufficiency implies a decision-making process that leads to the selection and employment of a cognitive stopping rule. The discussion of criteria that comprises cognitive stopping behavior leads Berryman (2008), Brown et al. (2007), Toms et al. (2009), and Zachs (2004) to define what is good enough information. Moreover, what is the threshold at which users are satisfied with the amount and quality of information and thus end information searches? In a study by Dostert et al. (2009), subjects estimated that they found about 51-60% of the relevant documents, which suggests a stopping threshold of about half the relevant documents for a topic. Most subjects decided to stop searching based on an internal threshold of enough information. Stopping behavior indicates a level of commitment to information that users accept as good enough.

METHOD
A controlled laboratory study was the principle method. Questionnaires, transaction logs, and interviews were the primary data collection instruments. This study used a convenience sample of 15 (10 female, 5 male) third- and fourth-year undergraduate students, ages 19-22. Subjects completed self-assessment questionnaires about their experience with information search, computers, search self-efficacy, domain knowledge, and domain interest using a Likert-type scale. Subjects then completed search tasks in four academic subjects (Botany, Geometry, Literature, and Psychology), which were selected based on curriculum requirements to obtain third-year status. Task times were evaluated using transaction logs.

Stopping behavior was operationalized as the time taken to read and complete search tasks for the four search domains. Then subjects assessed their search satisfaction and reasons for stopping a search in each domain using a Likert-type scale. They discussed their reasons for stopping searches.
during the exit interview. Descriptive and inferential statistics were calculated.

RESULTS

No association between domain knowledge and stopping behavior
The ANOVA compared the means of the four categorical groups that represented knowledge (independent variable) about four topics (Botany, Geometry, Literature, and Psychology) and compared how much variation occurred between each group in terms of task times (dependent variable). The ANOVA showed that between groups, variation in task times were not significant, \( p = .335 \). We can infer from this data that task time among the four domains was unaffected by users’ levels of domain expertise.

Positive correlation between levels of domain knowledge and domain interest
Results showed a moderate correlation between subjects’ domain knowledge and domain interest. Subjects who expressed interest in and knowledge about a domain were positively correlated (\( r = .418, \ p < .01 \)). This means that subjects who are interested in a domain are likely to increase their knowledge about a domain. Similarly, subjects who are not interested in a domain will unlikely investigate it further. Subjects read and learn about information in which they are interested.

Positive correlation between satisfaction with search processes and search results
Results showed a strong correlation between subjects’ satisfaction with the process and search results (\( r = .760, \ p < .01 \)). As subjects searched for information to complete the search tasks, they became either satisfied or dissatisfied with the process and the results. As subjects experienced satisfaction with the search results, they experienced satisfaction with the search process that retrieved those results.

Negative correlations between satisfaction with search results and task times
The results indicated a negative correlation between satisfaction with search results and task times (\( r = -.294, \ p < .05 \)). Subjects’ satisfaction with the search results decreased as the search task times increased. Conversely, subjects’ satisfaction with search results increased as the task times decreased. This negative correlation lends support to the satiation and disgust rules described by Prabha et al. (2007). As subjects became dissatisfied with the search results required to answer the task questions, they kept searching to complete the study, thereby increasing task time but decreasing satisfaction. Conversely, the more satisfied subjects were with the search results, the shorter the task times. This sentiment was expressed in the exit interviews.

To summarize the data about task times, no correlation occurred between task times and domain interest (\( r = -.067, \ p = .611 \)), task times and knowledge (\( r = -.018, \ p = .894 \)), or task times and search satisfaction (\( r = -.159, \ p = .225 \)). This suggests that stopping behavior operationalized as search task times remains uninfluenced by domain interest, knowledge levels, and search satisfaction.

CONCLUSIONS

Search stopping behavior was complex and was not reliant on any one variable. Does domain knowledge influence search-stopping behavior? In this study, domain knowledge was not found to influence search-stopping behavior as measured by task time. While domain knowledge does not influence task time, domain knowledge and domain interest were positively correlated. Search satisfaction and search processes were positively correlated. However, search satisfaction with results and search task times were negatively correlated. Clearly, search-stopping behavior is complex. Variables and combinations thereof may demonstrate associations and relationships for exploration in future studies. It is at this junction between search dissatisfaction and satisfaction with results that we need to focus our attention. This means that search results based on search terms and retrieval algorithms are important areas of focus to increase users’ satisfaction with search results.

REFERENCES


