8605439

Elkerton, Jay

A BEHAVIORAL EVALUATION OF COMMAND-SELECTION AIDS FOR
INEXPERIENCED COMPUTER USERS

Virginia Polytechnic Institute and State University   PH.D.   1985

University
Microfilms
International   300 N. Zeeb Road, Ann Arbor, MI 48106

A BEHAVIORAL EVALUATION OF COMMAND-SELECTION AIDS FOR INEXPERIENCED COMPUTER USERS

by

Jay Elkerton

(ABSTRACT)

Two experiments were conducted to determine the feasibility of providing online command-selection aids to novice users of an information retrieval system. The results of the first experiment revealed a difference in the mean and variability of search performance between novice and expert computer users. Half of the novices were performing much like experts, while the rest of the sample was extremely slow. These slower novices were using inefficient scrolling strategies and appeared to be unfamiliar with the structure of the database.

The second experiment evaluated whether novices could be assisted or trained with command-selection aids developed from the behavior of experts. The command-selection aids were defined in a 3 X 3 mixed factor design with type of model (frequency, sequence, or plan-based) as the

between-subjects variable and dialogue initiative (user, computer, or mixed) as the within-subjects variable. The frequency and sequence models presented and ranked search procedures based on a command-usage profile and a command-transition matrix, respectively. The plan-based model presented an ordered set of search procedures with verbal explanations. All models were constructed for groups of homogeneous search problems selected by a sorting and cluster analysis. The three dialogue-initiatives determined whether the user, the computer, or both the user and computer controlled presentation of advice. Administration of the dialogue initiatives was completely counterbalanced and was followed by a final unaided transfer session.

As a result of receiving online aiding, the wide ranging search performance of novice subjects was improved both during assistance and transfer. Performance of aided novices was superior to the slow novices and equal to the fast novices and experts. All three command-selection models were equally effective, with exception of the sequence model which sometimes presented frequent and complicated advice. Of the dialogues, mixed-initiated advice was ineffective during the first aiding session possibly due to the difficulties novices faced deciding whether to receive the suggested assistance. The conclusion

of the study was that online command-selection aids can be effective if providing appropriate feedback and minimizing the amount of dialogue in aiding.

INTRODUCTION

The selection and use of commands is one of the most basic skills required for proficiency in a software system. Mastery of the command language, however, is no easy task for inexperienced users. Users must not only learn the names and functions of commands, but must also learn the situations and strategies for using commands in a task. In this dissertation, online aids were designed and evaluated to help novice users in command selection. Specifically, the research assessed the feasibility of online command-selection aids for information retrieval.

Previous research by Elkerton and Williges (1984a, 1985) revealed large differences in the performance and strategies of experienced and novice subjects in a file search task. The results of these studies illustrated that experienced subjects not only used more powerful search procedures, but also used these search procedures quickly in the appropriate situation. In contrast, novice subjects selected a wider variety of search procedures and tended to use search procedures that manipulated the file search display directly. Thus, novices lacked both the knowledge and

strategies of file search that more experienced users possessed.

As a result of the observed difficulties in the selection and use of commands, Elkerton and Williges (1984b) implemented an online assistant to aid novice users in file search. The online aid was based on the selection of search commands by experienced users. Essentially, a frequency profile of the search commands selected by experienced users was provided automatically to novices. The results of this research revealed that the frequently selected search procedures of experienced users could serve as a training device, but were severely limited in assisting novices on current information retrieval problems.

Elkerton and Williges (1984b) explained the mixed effectiveness of the file search aid in terms of the limitations of the frequency-based model and the constrained dialogue with the user. The frequency-based model offered only limited information on command selection. Frequency data provided no sequence, planning, or procedural assistance to the novice user. Together with the one-sided, computer-initiated dialogue for offering advice, it was remarkable that novices could use the command frequency information at all.