Collaborative Search Research in College Computer Courses

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Abstract. The Internet has become the most important information source for students; however, most students lack adequate search processes and search abilities when solving problems using Web search. Current Web search with a single-user environment does not require students to seek assistance in solving their problem. Therefore, how to use information problem solving model to help students solve problems is an emerging issue, and integrated collaborative Web technologies with a suitable model is a key solution. We propose a novel collaborative search system, and it develops the knowledge base of an expert system by organizing the problem of the students. The experimental data were conducted with 36 students at a college school in Northern Taiwan. The results show that collaborative search benefits college student information gathering and improves search processes and search abilities.

Keywords: Collaborative search, Search process, Search ability.

1 Introduction

In recent years, Web search engines have developed significantly, and the proportion of college students using Web search to complete their homework is gradually increasing [1,6]. Web search systems have replaced the library as the major source of information for students. Although students may feel confident when using Web search systems, most students lack basic search processes and search abilities [7,8,9]. Moreover, Web search systems commonly used by students, such as Google, Bing,

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and Yahoo, are all designed for single users working in an independent environment. With the Web search system architecture, it is difficult for students working in a team to collaborate for seeking information, and students can rely only on their own search experience to solve problems when they encounter difficulties in a single-user Web search activity [4].

Therefore, we propose a novel collaborative search system, named TomoSearch, to elicit and organize knowledge and experiences regarding search strategy from students. TomoSearch is then employed to advise individual students to improve their search processes and search abilities on the Internet. TomoSearch contained functions included in systems of previous studies, such as keyword search, search statistics, and search result reviews. The digital annotation provides a recorded method for students to maintain an information record, and all student thoughts are shared with the whole group to meet awareness requirements. Integrated collaborative search with a proper information solving problem model was applied to a college computer class with 36 students. A series of experimental stages such as the investigation, questionnaire, and discussion revealed how the mechanism benefits the information gathering function of students and improves search processes and search abilities. The aim of this study is to propose the mechanism to improve students' search processes and search abilities. Finally, we explore how to use collaborative search influence students' search processes and search abilities.

2 Collaborative Search

Fig. 1 presents the functions of TomoSearch, which contains search box, group history, search suggestion, digital annotation, and discussion room. Comparison with pervious Web search systems, these functions satisfy college students to divide their search tasks and help each other by communicating and information sharing. When a student logs into the system, he/she can see his/her present collaborators in the group member window on the left side. The group member window shows who is searching for the same task and whether a group member is online or offline. A student can select a group member and talk to him/her using text messaging in the discussion room. The communication function is used to determine the search job, ask for help, or report an information finding. All text messages are kept on the server, enabling offline collaborators to join the discussion room. The group history is sent to their message window when they login.

After a student decides on a search task, he/she easily starts the search using the search box on the top of left. Web search engine choices include Google, Yahoo, and Bing. Different students can use a different Web search engine to expand the search area and reduce the likelihood of everyone finding only the same documents. Search results show in the browser on the right side.

The search processes of the group are aided by keyword suggestions. The system shows the six most frequently used search queries below the search box. Thus, students can learn what search words other members usually use to perform the same or