

Two Information Retrieval Learning Environments: Their Design and Evaluation

Kai Halttunen

Department of Information Studies
University of Tampere, Finland
kai.halttunen@uta.fi

The design and evaluation of two information retrieval (IR) learning environments took place in a basic course of IR (6 ECTS credits) at the Department of Information Studies at the University of Tampere. The course consisted of lectures, web exercises and tutored search exercises. Tutored exercises were carried out in two learning environments, in a traditional and in an experimental one. The participants in the study (n=57), were undergraduate students of information studies at the university.

The pedagogical design of the experimental learning environment was based on the ideas from anchored instruction and intentional scaffolding. Anchoring related the search exercises to a simulated journalistic work-task situation. Scaffolding, i.e. various ways of supporting learners in proceeding with their task was provided by an instructional tool, the IR Game, or by a teacher. The IR Game provides query performance feedback to the learner, based on predefined topics and a recall-base of known relevant documents for the topics. The pedagogical design of the traditional learning environment consisted of search exercises on several operational IR systems with unintentional scaffolding.

The effect of the learning environments on the students' learning experiences, performance and learning outcomes was evaluated. The evaluation was based on seven different datasets gathered in the basic course on IR. The datasets consist of two essays, answers to a questionnaire, results of a learning style inventory, log-files from two search sessions, stories describing learning experiences and answers to a course feedback questionnaire. The data were analyzed by qualitative and quantitative methods.

The results indicate that anchoring and scaffolding are promising strategies in IR instruction. Participants studying in the experimental learning environment took the view that anchored instruction increased meaningfulness of learning tasks. The overall effectiveness of queries in the search exercises was slightly better in the experimental environment and the students made far fewer semantic knowledge errors than the students in the traditional learning environment. Students from both environments made quite the same number of syntactic knowledge errors. The change in students' conceptual IR know-how was also larger in the experimental learning environment. The results of the study, in terms of the benefits of anchoring and scaffolding, are not categorical because of the range of intervening variables and the difficulty of setting up a field experiment which tried to be naturalistic but at the same time tried to focus on a specific aspect – the differences between the IR learning environments.

Publications

Halttunen, Kai: Two information retrieval learning environments : their design and evaluation. Ph.D Dissertation. Acta Universitatis Tamperensis, vol. 1020. 2004. Dissertation consists of introduction and summary of studies and four original research articles. Available: <http://acta.uta.fi/>

Halttunen, Kai & Sormunen, Eero. Learning information retrieval through an educational game : is gaming sufficient for learning? *Education for Information* (18) 2000:4, 289-311.

Halttunen, Kai. Students' conceptions of information retrieval : implications for the design of learning environments. *Library and Information Science Research* (25) 2003:3, 307-332.

Halttunen, Kai. Scaffolding performance in IR instruction : exploring learning experiences and performance in two learning environments. *Journal of Information Science* (29) 2003:5, 375-390.

Halttunen, Kai & Järvelin, Kalervo. Assessing learning outcomes in two information retrieval learning environments. *Information Processing and Management* (41) 2005:4, 949-972.