Coupling Computer-Supported Co-operative Work- and Hypermedia Technology for Distance Education Solutions

Andreas Auinger, Wolfgang Karrer, Chris Stary

Department of Business Information Systems, Communications Engineering
University of Linz, A-4040 Linz, Austria
{andreas.auinger,wolfgang.karrer,christian.stary}@ce.uni-linz.ac.at

Abstract

Searching for highly interactive and cooperative technologies in the field of distance learning has led to the development of a novel solution. It overcomes existing deficiencies with respect to context-sensitive and individualized interaction in shared learning spaces among learners and teachers. In this contribution we present the results and benefits of integrating computer-supported-cooperative-work- and hypermedia technology at the methodological and conceptual layer, and, based on that, at the implementation level. The application of concepts, such as profiling, has led to several positive effects in practice. We also report on the problems when providing the proper technology support. However, first results from evaluation indicate an increase in usability with respect to the acceptance of electronic media for interactive learning support in distributed environments.

1. Introduction

Distance Learning/Teaching is based on the idea that learners participate in a self-managed way in knowledge transfer processes. Thereby, learners and teachers do not have to be available continuously and at a single location when interacting. However, the process of knowledge transfer is subject to (course) planning and organization, including the collaboration and interaction between learners and teachers, e.g. [8]. Traditionally, distance education is based on novel I&CT (Information and Communication Technologies) and services, such as hypermedia available via the web, and electronic support of collaboration and individual knowledge management, e.g., chats and multi-media annotations [7]. Unfortunately, the acceptance of these approaches is rather limited, as recent empricial findings reveal [16], and the National School Network Testbed initiative (http://nsn.bbn.com) has shown:

- Mentoring and supervision via tele media have not been accepted by learners.
- Existing I&CT as Internet- or web-based tools do neither support knowledge transfer nor group work effectively and efficiently.
- The production of material is time-consuming and lack operational support.
- The participants could not experience any added value due to the electronic availability and computer-supported features compared to conventional settings in education.

The problems/deficiencies listed above have been experienced, although the Internet and its services, such as the web, have turned out to be easy to handle for teachers and learners. It can be concluded that organizational hindrances or/and the ***utilization*** of I&CT for material preparation, transfer of knowledge including mentoring, interaction and collaboration has not been put on a sound conceptual basis. Recent studies on that issue, e.g. [3], have concluded that task-oriented and interpersonal interaction are the most crucial factors for the success of distance learning environments. These issues have also been addressed through principles for design and evaluation: sociability, connectivity, immersion, presence, and engagement [17]. As a consequence, in the course of the SCHOLION (SCaleable tecHnOLIOgies for teleteachiNg/learning) project (http:// instserv0.ce.uni-linz.ac.at/scholion) we had to develop a conceptually sound integration of features for collaboration and interaction based on hypermedia for education. This project should lead to higher user acceptance through increased usability than previous approaches.

In the following sections we review related work with respect to the integration of hypermedia I&CT and collaboration support (section 2). We then revisit the