Chapter IV

Supporting Distributed Problem-Based Learning: The Use of Feedback Mechanisms in Online Learning

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ABSTRACT

In this chapter we discuss possibilities and shortcomings of Internet usage for distributed problem-based learning. Several problems with the use of computer-mediated communication for collaborative learning online are identified. In our approaches we use data that is automatically tracked during computer-mediated communication and extract relevant information for feedback purposes. Partly automatically, partly manually prepared the feedback is a rich resource for learners to manage their own collaboration.
process as well as subsequent problem-solving processes. In a synchronous and an asynchronous distributed problem-based learning environment, we show how we applied this methodology to support learners’ motivation and problem solving. Analyses show encouraging benefits of our approach in overcoming common problems with computer-mediated communication.

**INTRODUCTION**

When James Cook started his last journey to find the Northwest Passage through North America, his wife was angry with him because he had promised her that he would never go on a long voyage again. During the whole trip he was supposed to be in an ill-tempered mood totally different from his normal style, badly collaborating with his crew and behaving harshly and unfairly to the native people he met. No wonder that he was killed on the islands of Hawaii in 1779. What he did not know was that his wife had already forgiven him, so some might say that if he had seen her smile, this would have changed the whole course of history. Is this true? Does such a form of emotional feedback have an impact on people’s performance in a group situation? Did Cook die due to a lack of feedback?

Nowadays, most of the white spots on Earth have been explored and Internet technologies have made the world smaller. People communicate, collaborate and even learn together using the Internet. There is much ongoing research about how to use computer-mediated communication (CMC) for task oriented groups. Actually, little research is dedicated to the use of technology for feedback purposes during online collaboration, especially in distributed problem-based learning. There are also many studies exploring feedback mechanisms in individual computer-based learning, especially for knowledge acquisition purposes. Research concerning intelligent tutoring systems (ITS) has provided evidence for a meaningful use of individual feedback based on learner-program interaction (Wenger, 1987). Unfortunately, this tradition has yet not reached contemporary learning approaches using computer-supported collaborative learning (CSCL).

Besides the use of computer generated feedback on a task level, there is hardly any exploration of its effects on a group’s interaction level. Although interacting and communicating is crucial to problem-based learning (PBL), most approaches transferring PBL into a network-based learning environment do not pursue approaches to give learner support on this level.

Some earlier research, for example Mandl, Fischer, Frey and Jeuck (1985), discusses some computer-based feedback mechanisms and functions, but does not specifically refer to a group context. So far, these investigations have not been carried further. Possible reasons might be a lack of underlying theoretical assumptions and derivations of specific hypotheses.
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