Chapter 3
E–Collaborative Knowledge Construction in Chat Environments

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ABSTRACT
Chat-based tools are often used for computer-supported net-based learning and knowledge construction. However, due to its media characteristics, chat-based communication frequently suffers from deficits due to incoherence of contributions, lack of coordination as well as related problems of awareness. These shortcomings of conventional chat-based communication pose severe problems for online knowledge construction and learning. We claim that these restrictions can be overcome and propose that extending the medium ‘chat’ with appropriate educational and conversational strategies embedded in the chat environment can actually improve the learning discourse and thus support collaborative knowledge construction. Relevant approaches and recent research will be reviewed. Conclusions for the design of chat-based CSCL environments will be discussed.

INTRODUCTION
From the beginning chat was predominantly used for casual internet communication. In the meantime it has become a common and well-established form of communication also for serious purposes in educational as well as in business contexts. Among its advantages are its easy access, its low-tech affordances, high usability and fast and flexible communication processes. A variant of chat, SMS messaging, has met the public with unexpected popularity.

Nevertheless, due to its media properties, chat-based communication frequently suffers from deficits due to incoherence of contributions, lack of coordination and problems of awareness concerning social awareness as well as awareness of context and available knowledge (Herring, 1999; Pimentel, Fuks, & Lucena, 2003). These restrictions of conventional chat-based communication pose severe problems for online knowledge construction and learning processes in collaborative settings (Jucks, Paechter, & Tatar, 2003).
We suggest and elaborate in this chapter that chat environments can be redesigned and enriched in a way to support serious educational needs and to meet the requirements of professional life.

Collaborative learning can be loosely defined as a learning method involving a group of learners who exchange knowledge and/or solve a problem together and interdependently, that is, under a common learning goal (Johnson & Johnson, 1992). The particular setting of computer-supported collaborative learning (CSCL) or, more precise in this case, net-based e-collaborative knowledge construction in chat environments implies that participants are separated physically and communication is mediated by chat tools via the internet. With respect to time, chat-based communication is synchronous with participants communicating at the same time, although chat might be located somewhat in the middle between fully synchronous communication such as phone calls and fully asynchronous tools such as mailing lists (Fuks, Pimentel, & Lucena, 2006).

This chapter focuses on e-collaborative knowledge construction in chat environments. Thus we will discuss computer-mediated net-based textual synchronous knowledge communication in groups, that is, between two or more participants. A basic assumption of collaborative knowledge construction is that learning outcomes will improve when learners need to make their current knowledge and their lack of knowledge explicit, and when they need to negotiate via arguments, critiques, and justifications with other participants during a discourse (Stahl, Koschmann, & Suthers, 2006). As a result, this is expected to lead to deeper understanding, to better retention, and knowledge should be more easily transferred and applied. Learning environments should elicit and support these kinds of genuine learning interactions that induce the emergence of knowledge and understanding (Dillenbourg & Hong, 2008). However, what actually constitutes a genuine learning interaction is still far from clear (Soller, Martinez, Jerman, & Mühlenbrock, 2005).

We argue here that the shortcomings of chat-based communication due to its media properties can be overcome, and we propose that extending the medium ‘chat’ with appropriate educational and conversational strategies embedded in the chat environment as tools or interface features can actually improve the learning discourse and thus support collaborative knowledge construction beyond casual everyday communication. Relevant approaches and recent research will be reviewed, and conclusions for the design of chat-based environments will be discussed both with respect to academic scenarios as well as with respect to the needs of practitioners.

**BACKGROUND**

Computer-supported collaborative learning requires successful communication as a prerequisite (Pfister, 2005). The collaborating learners should understand each other’s contributions to the learning discourse and be able to generate a shared understanding of the content under discussion. These basic communication elements can be understood as located on a micro-level, upon which more encompassing didactical components are built comprising what might be called the macro-level. A macro-component, such as collaboratively summarizing a portion of text, will only function properly if the micro-level mechanisms, such as a coordinated exchange of messages, works out smoothly.

From a linguistic perspective communication mechanisms in chat environments share many features with oral language although it is a textual medium (Beißwenger, 2007). Nevertheless, the properties of the medium and the distinctive features of chat in particular lead to discourse structures that are very different to the ones of spoken face-to-face communication, in particular if groups of more than two learners communicate simultaneously (Bromme, Hesse, & Spada, 2005; Jucks, Paechter, & Tatar, 2003).