In order to adapt to changing learning environments, instructors must be aware of the challenges that virtuality brings to establishing a shared understanding among online learners. Although developing shared mental models is typically a natural part of learning, it requires significant social and task-related interaction among students, which can be difficult in computer-based environments in which social presence is lacking. This chapter will briefly discuss research related to the development of shared understanding and explore what instructors can do to address challenges and facilitate the development of shared knowledge in computer supported collaborative learning environments.
Introduction

The way we learn has changed immensely over the past several decades. With the advance of technology, the typical face-to-face classroom setting is no longer the only option for learning. Internet and computer technology allows for students to gain knowledge from new sources as well as to work in new forms of interaction, changing the dynamics between instructors and students. Indeed, the proliferation of university and other degree-oriented Internet-based instruction is largely due to the wide-spread use of the Internet and the development of related technology. Instructors in these online learning environments, while still an invaluable knowledge resource, have changed to emphasize more of the facilitation, rather than impartation, of learning. This new role is one that promotes learning not only from the instructor-student relationship, but also through student interactions with one another.

Learning is not simply an instructor to student relay of information. Although classroom instruction has always had the potential for interaction among students as well as between students and instructors, it has also been widely associated—rightly or wrongly—with less learning-enabling forms of instruction (e.g., lectures). Online learning technology does not prevent the use of lecture-style instruction, however it does make more interactive forms of instruction more readily available, and easier to pursue. With the continuous and constant flow of information surrounding us due to changes in technology and communication practices, students now face a world in which learning comes from multiple sources. Today’s classroom is often found online or supplemented by online discussions and interactions, where both students and instructors contribute to learning outcomes. However, this is not to say that instructors have become any less necessary; indeed, they remain a vital part of developing and maintaining the flow of knowledge.

In a collaborative environment, it is important that students—as facilitated by the instructor—develop an understanding that encompasses the knowledge being dispersed. In addition to the vast resources available online, the amount of information available in a collaborative environment is bountiful, coming from the experiences and knowledge of students as well as the instructor. During learning, individuals develop and utilize knowledge structures to organize information as it is learned (Anderson, 1983, 1993). These knowledge structures are sometimes referred to as mental models or schemas. When individuals are learning in groups, it can be beneficial for the group to have a common mental representation of the knowledge domain to facilitate sharing
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