Chapter 5.9
Addressing Emotions within E-Learning Systems

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ABSTRACT

Emotions are attracting growing attention within the instructional design research community. However, clarification is still required as to how exactly to address emotions within the field of e-learning. The aim of this chapter is twofold. Firstly, we will focus on the reasons for including emotions within the instructional technology domain, and in particular, on the relevance of emotions to computer-based learning. The need for specific theory in this regard is heightened by the current drive to design instructional devices that interact with learners in a motivating, engaging, and helpful way. Secondly, within the of the framework affective computing paradigm, the different modalities for detecting emotions in instructional technology contexts will be systematically reviewed, and the strengths and limits of each will be discussed on the basis of the most up-to-date research outcomes. Finally, a tentative architecture for emotion recognition in computer-based learning will be proposed, focusing on the adoption of a multimodal approach to emotion recognition, in order to overcome the limitations and the difficulties associated with individual modalities.

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INTRODUCTION

The Role of Emotions in Learning

There is growing recognition that emotions and affect play an important role in learning. The learning process is influenced by factors connected to the person, the task, and the context as well as the learner's own on-going evaluation of the process itself. Situational characteristics and individual appraisals can trigger emotions (Efklides & Volet, 2005). In turn, as stated by Barrett and Salovey (2002), affect in learning facilitates the development of persistence and interest in a topic. Emotions can also influence learning through information processing activity and organization of recall (Pekrun, Goetz, Titz, & Perry, 2002). Furthermore, emotions can provide information about the learner's own evaluation of the learning process, since they are linked to control- and value-related appraisals within a learning environment (Gläser-Zikuda & Mayring, 2003). For instance, positive emotions generally indicate that successful task control and interest have been experienced. Our learning, therefore, is heavily dependent on the emotional state we are in (LeDoux, 1998), and on the dynamic pattern of positive and negative emotions occurring in a given time period within a learning context (Sansone & Thoman, 2005).

The role of emotions can be relatively easily recognized and managed within face-to-face learning, where they have been shown to be significantly related to student motivation, learning strategies, cognitive resources, and achievement (Pekrun et al., 2002). What is worth considering is the role of emotions when students are remote from their teacher—even when computer-based education can be supported by a human tutor, the latter is likely to have a lesser awareness of the emotional state of students, and may thus more easily fail to provide a responsible teaching presence and appropriate leadership and direction (Wosnitza & Volet, 2005). Despite general awareness of the need to consider emotions in e-learning environments, it seems that, with the exception of computer anxiety, the emotions experienced during computer-based learning have not yet been analyzed in depth (Pekrun, 2005). Thus, there is a great need for e-learning projects to take the role of emotions in learning into account and to integrate this understanding into their pedagogical approach.

Affect and Emotions in E-Learning Design

Very often, e-learning implies the presentation of information and material on a very rational basis, overlooking the role of emotions. Yet, computer-based learning can be affected by a range of emotions, including some which do not occur within face-to-face learning, such as emotions directed at technology. Nowadays almost all Web-based training platforms allow computer-mediated communication, where e-learning can take place within either solo or social situations. In solo learning, self-directed, task-directed, and technology-directed emotions have been identified. In social online learning, further emotions have been observed, such as emotions directed at another learner, at the group the learner belongs to, or at another group of learners that his/her group is interacting with (Wosnitza & Volet, 2005).

Moreover, as O'Regan (2003) has pointed out, there has been little exploration to date of the extent, nature, and significance of affect and emotions in e-learning design. If emotions are essential to human thinking and learning processes, virtual platforms and learning environments need to cater to the emotional factor in order to be successful. In particular, the computer graphical interface should not treat humans like information processing machines, but should take their emotions into account. Therefore, it is critical that system designers consider the range of possible affective states that users may experience while interacting with the system.