

Chapter VIII

A Framework for Building Emotional-Motivational Agents as Intelligent Tutoring Entities

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Inside Chapter

This chapter presents our efforts to integrate role theory and agent technology in order to support collaborative work/learning processes between users spatially distributed within a synchronous collaborative virtual environment. Our work aims to overcome a major inconvenience in distance education systems: tutors' difficulties when following up a distance collaborative learning process and in particular those students who cannot keep up progress with their team-mates. Our approach embraces the learning paradigms mentioned above and the work on pedagogical and intelligent agents as a mechanism for modelling and analyzing student-tutor interactions.

Introduction

Several studies (Glaser, Chi, & Farr, 1988) have established that knowledge needs to be connected and organized in important concepts and this structure should allow transfer to other contexts. It was also shown that the learning process improves when the students are in charge with their own learning, develop meta-cognitive strategies to assess what they know, and acquire more knowledge if necessary. In other words, the learning process must help students build knowledge from existing knowledge (constructivist learning), guide students to discover learning opportunities while problem solving (explorative learning), and help students to define learning goals and monitor their progress in achieving them (metacognitive strategies).

Applying these theories to distance education systems can lead us to a constructivist learning environment which encourages students to be more proactive in determining learning paths and synthesizing information from multiple sources. Hence, learners should not be constrained to a predefined learning path (Kinshuk & Ashok, 1997). This requires not only adequate tools but also the environment to allow meaningful interaction between the student and the learning system. According to Sims, meaningful interaction is not merely pacing back and forth in a linear manner along prescribed paths but involves engaging the student with the learning content in a proactive manner.

Current distance and open learning devices attempt to mitigate the difficulties encountered by learners when they follow a distance course. Then it is necessary to take account of these difficulties when distance learning is set up, avoiding insulation and a loss of motivation by learners that are the cause of many giving up (Rene-Boullier, 2003). Keeping this in mind, an interesting question arises from a system design and implementation viewpoint: "How do we design a truly interactive environment based on the learning paradigms presented above?" By truly interactive environments, one can understand an environment which keeps the learner(s) motivated and interacts with them.

This chapter presents our efforts to integrate role theory and agent technology in order to support collaborative work/learning processes between users spatially distributed within a synchronous collaborative virtual environment. Our work aims to overcome a major inconvenience in distance education systems: tutors' difficulties when following up a distance collaborative learning process and in particular those students who cannot keep up progress with their team-mates. Our approach embraces the learning paradigms mentioned and the work on pedagogical and intelligent agents as a mechanism for modelling and analyzing student-tutor interactions. Our motivation comes from the fact that German students are required to spend at least one semester abroad. With the usage of the new media and communication technologies, it should be easier for foreign students to follow the studies in Germany. Further, it can provide to German students the opportunity to take part in

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