

Chapter 2.7

Supporting Group and Individual Processes in Web-Based Collaborative Learning Environments

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ABSTRACT

This chapter tackles the issue of how it is possible to integrate individual differences in the learning design of Web-based collaborative learning experiences. In particular, in online collaborative learning environments, it is quite common to adopt techniques to support collaboration and interactions among peers. This contribution proposes to monitor the enactment of the collaborative techniques to make individual and group differences emerge, thus allowing the consequent customization of the learning experience. To this aim, a monitoring model is proposed, whose flexibility allows the tutor to bring different aspects and different levels of the ongoing learning process under control

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INTRODUCTION

One of the main issues in the field of web-based education is how to incorporate individual differences in the learning design (Jonassen & Grabowski, 1993); the problem is currently being addressed from very different perspectives, ranging from the psychological point of view (Anastasi & Foley, 1949; Eysenck & Eysenck, 1985; Merrill, 2001), to more technological perspectives, aimed at finding new technical solutions to meet individual styles and behaviors (ranging from Intelligent Tutoring Systems (ITS) to Adaptive Hypermedia Systems (AHS)) (Brusilovsky, & Peylo, 2003).

The issue of incorporating individual characteristics in the learning design is strictly related to the two concepts of *individualization* and *person-*

alization, the former being more focused on the ability of a learning environment to offer an ad hoc learning path to a certain student according to her/his individual characteristics; the latter being devoted to the possibility of the student to personally choose a certain path (Clarke, 2003). Going beyond the differences between the two concepts, there is a common idea underpinning them, that is that web-based education should not coincide with fixed, pre-determined contents to be equally distributed to all learners independently of their individual characteristics, but rather that contents (and the way they are presented) should evolve during the learning experience, on the basis of the learner's styles, attitudes and behaviors (O'Connor, 1999; Henze et al., 2004; Lee, 2004). Even the most common specification in the field of learning design, namely IMS-LD¹, recognizes personalization as a necessary aspect to be addressed (Koper & Olivier, 2004).

But what does this mean in collaborative learning environments? To what extent are individualization and personalization possible in contexts that are primarily based on discussion and negotiation among peers as the way to construct knowledge?

Brusilovsky and Peylo (2003) state that "Intelligent collaborative learning is an interesting group of technologies developed at the crossroads of two fields originally quite distant from each other: computer supported collaborative learning (CSCL) and ITS. The recent stream of work on using AI techniques to support collaborative learning has resulted in an increasing level of interaction between these fields.[...] Currently we can list at least three distinct technologies within the intelligent collaborative learning group: adaptive group formation and peer help, adaptive collaboration support, and virtual students" (p. 161).

This chapter aims to provide a more methodological contribution to the discussion in this field, by focusing on monitoring as a practice able to provide the tutor of an online collaborative learning experience with a run time picture

of the participative, the social, the cognitive and the teaching dimensions, as they are developed by students performing activities, in such a way s/he can individualize the learning path according to the emerging individual and group characteristics. In other words, in this contribution monitoring is considered a valuable, methodological solution to address individualization in web-based collaborative learning processes.

BACKGROUND

In the last decade constructivist approaches have been increasingly appreciated, ranging from "radical constructivism", which states that there is no reality, but only individual speculations and interpretations are possible (Suchman, 1987), to the "situated constructivism" point of view, which assumes that it is by using social patterns that we conceptually interpret events, objects, and perspectives and thus construct knowledge (Jonassen, 1991). According to the mentioned approaches, educational experience has to be as authentic and genuine as possible, so that learners can observe and critically reflect on real situations (Bendar et al., 1992). These methods lead far away from traditional, transmissive paradigms of learning and encourage the adoption of more modern, participative approaches. Partially inspired by these approaches, "social constructivists" definitively stress the importance of the social dimension in the process of developing new knowledge and state that learners develop understanding using language in discussion, collaboration and debate. Language therefore becomes the basic element of an educational experience (Vygotsky, 1962). In other terms, during a learning experience "the process of negotiation is how we construct knowledge and, if the process of negotiation results in agreement, the agreement is reality" (Kanuka & Anderson, 1999).

On this line, *Computer Supported Collaborative Learning* (CSCL) is the research area

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