
Chapter IV

Improving Usability of an Online Learning System by Means of Multimedia, Collaboration and Adaptation Resources

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ABSTRACT

This paper describes an adaptive and collaborative environment for helping problem solving. The main user of the environment is a teacher, here called teacher-student, who accesses the environment aiming at solving difficulties he/she encounters in the classroom. In order to improve the usability of the system during the problem-solving process, the environment provides the teacher-student with adaptive assistance by identifying what information should be

provided and how it should be shown on the screen according to characteristics of the teacher-student, domain and context of use. Moreover, the teacher-student has a collaborative support that allows him/her to interact with other teacher-students.

INTRODUCTION

The usability of an interactive system refers to how easy it is to use and learn the system. In online learning system contexts, the pedagogic usability is also related to how easy and effective it is for a student to learn something using the system. An attempt to ensure usability is to take into account characteristics of the user (such as preferences, language, culture and system experience) and of the context of use (such as easy accessibility and good luminosity of the environment) during the development of a system. This allows the adaptation of the interfaces to the user's needs, varying, for instance, the kind of assistance that is to be offered to the user and the way it is to be shown in order to cope with individual differences. Adaptability improves handling and learning of the interface (Benyon, Crerar, & Wilkinson, 2001). Another way to ensure pedagogic usability is to make it possible for the user to reflect about his/her difficulties on his/her own and with others. Several educational theories claim that learning depends on the individual's knowledge being built by social interactions (Bourne, McMaster, Rieger, & Campbel, 1997; Vygotsky, 1984). We have identified some problems to a successful deployment of online learning:

- Lack of learning quality—Many online learning systems don't bring users to reflect about their problems since they simply present predefined solutions.
- Lack of adaptive tools and guidelines—Learning tools are very useful, but most are not adaptive (Schön, 1987) or else the user model is predefined (Gomes & Viccari, 1999). In addition, user interfaces (UIs) of such tools are generally specified without taking into account guidelines (Eleuterio & Eberspacher, 1999).
- Lack of training in new technologies—Any teacher (our teacher-student), as part of his/her professional development, needs continuous training. Teachers' training is often carried out by using old technologies that cannot deal with adaptive and collaborative processes. It is necessary to fulfill these needs by adopting an integrated pedagogical-technological content (Perrenoud, 2001).

All of these issues have a critical impact on the usability of online learning. Thus, we developed a collaborative and adaptive distance learning environment called Tele-CADI that helps a teacher-student solve his/her difficulties during classes by offering adaptive assistance. Tele-CADI aims:

- To increase the quality of learning—Tele-CADI is supposed to do this by adopting a collaborative problem-based solving strategy. The basis of this strategy is the use of case-based reasoning methods (Aamodt & Plaza, 1994).

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