Chapter 3
Virtual Co Learner:
An Approach Against Learner’s Isolation in Asynchronous E-Learning

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ABSTRACT

Adaptation and personalization of the information and instruction offered to the users in on-line e-learning environments are considered to be the turning point of recent research efforts. Collaborative learning may contribute to adaptive and personalized asynchronous e-learning. In this chapter authors intend to introduce the Virtual co Learner (VcL) that is a system designed on a basis of distributed architecture able to imitate the behavior of a learning companion who has suitable to the user’s cognitive and learning style and behavior. To this purpose an asynchronous adaptive collaborating e-learning system is proposed in the sense of reusing digitized material which deployed before by the users of computer supported collaborating learning systems. Matching real and simulated learners who have cognitive characteristics of the same type, one can find that learning procedure becomes more efficient and productive. Aiming to establish such VcL, one faces a number of questions. An important question is related to the user’s cognitive or learning characteristics diagnosis. Other questions are examined too.

INTRODUCTION

Collaborative learning provides an environment to enliven and enrich the learning process and so, it has well known benefits. The presence of interactive partners into an educational system creates more realistic social contexts, and increases the effectiveness of the system. As Vygotsky (1978) pointed out, “in a collaborative scenario, students interchange their ideas for coordinating when they working for reaching common goals. When dilemmas arise, the discussion process involves them in learning”. When the learners work in groups they reflect upon their ideas (and those of their colleagues’), explain their
opinions, consider and discuss those of others, and as a result, learn. In this way, each learner acquires individual knowledge from the collaborative interaction. A collaborating environment would help sustain the learner’s interests and would provide a more natural learning habitat. Collaborative learning deals with instructional methods that seek to promote learning through collaborative efforts among learners working on a given learning task. As the importance of collaborative learning is widely accepted in learning theorists, implementation of collaborative learning in Learning Management Systems (LMSs) arises as of crucial interest. The three basic factors in collaborative learning are: the tutor, the learner and his/her co-learner. The role of the late is crucial. Many students emerge from basic science courses with inabilities to apply the scientific concepts or principles that they ostensibly learned, with significant misconceptions, and with poor problem solving abilities. They need to, and they use to address questions and so they expect to get answers. Tutors respond to their questions with accuracy and their responses are also characterized for their educational value. This is not the case when the learner addresses questions to his co-learner. A co-learner responds inaccurately and in many cases gives fault answers. Even so, the presence of a co-learner is meaningful. Therefore, it is crucial for researchers to focus their attention on the design of systems capable to integrate a simulated co-learner. The goal of building a computerized Simulated Student (VanLehn et al. 1994) is to facilitate the learner’s own efforts at learning by employing cooperative learning techniques.

Computer Supported Collaborative Learning (CSCL) offers students many advantages and so delivers a collaborative environment that deals with “learning”. Such system can take an active part in analysing and controlling collaboration. Learners exchange ideas and reflect upon other points of view. A CSCL usually is supported by a system of simulated learners that play various roles in collaborating learning. In fact, simulated learner can be simultaneously an expert and a co-learner, scaffolding and guiding the humans’ learning in subtle ways. It also provides an attractive environment for learning skills of problem solving. To Poly(a) (28), problem solving was a major theme of doing mathematics and “teaching students to think” was of primary importance. “How to think” is a theme that underlies much of genuine inquiry and problem solving in mathematics. Collaboration experience can also facilitate planning and problem solving. Blaye et al. [Blaye et al. 1990, Blaye1989] showed that children who had previously worked as collaborative pairs on the task of planning and problem solving were twice as successful as children who had had the same amount of experience working alone. In CSCL students involved in planning and problem solving tasks, interact to each other asking questions and explaining answers. Based on the above remarks, a new question arises: Is there any way the digitized material formed from all the questions and explanations produced by the CSCLs’ users, to be reused?

The scope of this chapter is to provide a starting point for the development of a system capable to collect and to store digitized material (in question above) produced by CSCLs’ users to the purpose of reuse it. Furthermore, the proposed system should be able to manage such material in the best possible way in favor of real learners. Therefore, the proposed system has to be adaptive to learner. It also has to make use standards in order to classify and retrieve the stored material in the best possible way.

There are several points of view to look at such an issue. In what follows, a Virtual co Learner (VcL) capable to collaborate by asking questions or by responding in the form of explanations to questions posed by the real learner is presented. Research over the last fifteen years has provided solid evidence that generating explanations can lead to deeper understanding when learning new material. There remain however, many unanswered questions about the factors that influence
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