Chapter IV
Observation as a Requisite for Game-Based Learning Environments

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ABSTRACT

In this chapter, the authors propose a Game-Based LMS called the pedagogical dungeon equipped with cooperation abilities for particular activities. The main purpose of this chapter is to explain how to keep awareness of the on-going activities while remaining involved in the game itself. The difficulty is to provide the teacher with this awareness in an immersive way, making the teacher more involved in the game when s/he obtains feedback on the activity. The chapter is split into three sections. The authors propose a first section that deals with the description of our view of learning games illustrated through the pedagogical dungeon. They briefly describe the generation of a dungeon from activity preparation and the links between pedagogical concepts and their representation in the dungeon. The second section concentrates on the observation features needed in these environments in order to obtain interesting facts on what is going on. The authors need to collect traces of the collaborative activity during the enactment phase. They describe the trace life cycle and explain how facts constituting awareness can be calculated from the traces. The third part deals with the restitution of this awareness to the teacher. The problem here is to find an appropriate way to represent awareness both of students’ knowledge and behavior. This awareness must be perceived through appropriate graphical representations to preserve
the “immersion” property, implying that these representations must be directly present in the game. The pedagogical dungeon has been experimented during several practical works with real classrooms at the University of Savoie and the Graduate Business School of Chambéry, France. This experimental approach illustrates the different aspects of the work, concerning the learning game itself, the observation features, and the restitution of the awareness to the teacher.

INTRODUCTION

Nowadays, Learning Management Systems (LMS) offer functionalities that are recognized as being valuable from different points of view. For instance, students can learn at their own speed. These environments also allow the teacher to evaluate specific activities in a uniform way. However, although these environments enable powerful features, they also incur two major kinds of criticism. The first one deals with the non-attractiveness of such environments for the students, as very often students tend to consider them as unexciting. The second one relates to the lack of awareness (see (Greenberg, Gutwin, & Cockburn, 1996) for a definition of awareness) from the teacher’s point of view as shown by (Kian-Sam & Chee-Kiat, 2002): s/he no longer has the usual and helpful student’s feedback (eye contact, general attitude). As reported in (Hijon & Carlos, 2006), where the authors compare the built-in student tracking functionality of various CMS tools, this functionality is far from satisfactory. The regulation of the activity is thus much more difficult.

Concerning the first point, agreeing with Vygotski’s school of thought and activity theory, we consider that the social dimension is crucial for the cognitive processes involved in the learning activity. Consequently, the question was how to enhance the social dimension in such environments.

Observing the emergence and success of online multiplayer games with our students – the so-called “digital natives”-[Summit on educational Games, October 2006 (http://www.fas.org/gamesummit/)], more generally in the world (Rosenbloom, 2004) and even in education (Purdy, 2007), (Scott, 2007), it was decided to use one as a support for our course. This led us to apply the metaphor of exploring a virtual world, a dungeon, where each student collects knowledge related to a learning activity. It is our view that the way to acquire knowledge during a learning session is similar to the exploration of a dungeon. This approach reveals advantages such as a recreation-type process, a large usability of the tool or its adaptation to the student’s speed. Such game-based learning environments can thus be proposed as a way of implementing learning sessions, in which teachers can prepare and follow a pedagogical scenario (see (Kinshuk, & Patel, 1996) for a definition of a pedagogical scenario).

Concerning the second point; for usability purposes, it is essential that Computer-Based Education offer the possibility of monitoring the activity performed by the students and of obtaining information or feedback about it. For example, being aware of the learning progression of each student is an important goal for the teacher. Here, we explain how we can avoid the loss of perception for the teacher in these environments.

In this chapter, we propose a Game-Based LMS called the pedagogical dungeon equipped with cooperation abilities for particular activities (see (Dillenbourg, Baker, Blaye, & O’Malley, 1996) for a list of cooperation abilities). The main purpose of this chapter is to explain how to keep awareness of the on-going activities while remaining involved in the game itself. The difficulty is to provide the teacher with this awareness in an