

Chapter 25

Hints for Improving Motivation in Game-Based Learning Environments

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ABSTRACT

In this chapter, the authors propose to address two main items contributing to motivation in Game-Based Learning Environments: the flexibility of the system and the immersion of the users in the system. The chapter is split into three sections. The first one deals with the need for adaptation from both the teacher's and the learners' point of view. The authors need to collect traces about pedagogical activities in order to propose observation features for updating a user model adapted for learning games. This user model is seen as an explicit collaborative object displayed in the game. The second section concerns the necessity of keeping the users immersed in the game and gives some guidelines for immersion concerning game design, game play and metaphorical support. The last part illustrates these points through a game-based learning environment called "learning adventure". The generation of a learning session in the environment is described and a real experiment is used as a support for explaining the concepts presented above.

PART 1: INTRODUCTION

Nowadays, compared to traditional teaching methods, 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 envi-

ronments also allow the teacher to evaluate specific activities in a uniform way. However, although they enable powerful features, they also receive major kinds of criticism (lack of awareness, few collaborative or *regulation* possibilities (Kian-Sam & Chee-Kiat, 2002)). Some students tend to consider LMS as unexciting (Prensky, 2000).

Concerning this particular point, and in agreement with Vygotsky's school of thought and ac-

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tivity theory (Vygotsky, 1934), we consider that the social dimension is crucial for the cognitive processes involved in the learning activity. Consequently, the question is how to enhance the social dimension in such environments. The emergence of learning games provides a possible answer to this problem and is seen as an evolution of “classical” LMS (Hijon, 2006). Learning Games have already been recommended as possessing several pedagogical qualities (Squire, 2003). For instance, they offer a specific and progressive learning curve adapted to each learner, they allow distance learning, and they can encourage specific usages in education such as collaborative learning or project pedagogy. More generally, videogames are even seen as providing a new form of rhetoric thanks to their basic “representational mode of procedural-ity” (Bogost, 2007) and may be a means by which to envisage programming or computation with a brand new view (Matheas, 2005).

Observing the emergence and success of online multiplayer games with our students, it was decided to experiment our own learning game approach, by developing a new game and by using it as a support for some learning sessions. We apply the metaphor of exploring a virtual world called “*Learning Adventure*”, where each student embarks on a quest in order to collect knowledge related to a learning activity. We think that the way of acquiring knowledge during a learning session is similar to following an adventure in a Role-Playing Game (RPG). The combination of the two styles is called MMORPG and offers a good potential for learning (Galarneau, 2007; Yu, 2009) reformulated as MMOLE. On this point, we agree with (Buckingham, 2007) underlying affordance between Game and Educational practice by drawing attention to all the aspects of games that need to be addressed carefully.

A major factor in obtaining good results in the learning activity is the motivation of the learners, as reported in (Amory, 1999; Kirriemuir, 2004; Galarneau, 2007; Dondlinger, 2007). In this chapter, we would like to address two main

items contributing to motivation: the *flexibility* of the system and the *immersion* of the users in the system, also generally seen as a fundamental component of the game play (Ermi, 2005).

Flexibility

There is a need for adaptation both from the teacher’s point of view (adaptation of the difficulty of the exercises, addition of new activities, splitting the group into sub groups) and from the learners’ (motivation is sometimes related to novelty – the sequencing in the game should not be the same when one starts an adventure and when one has already completed some steps in the previous sessions).

These needs for adaptation can also be categorised into two groups: those that are related to adaptation during the activity (the need for dynamic adaptation) and those that are related to adaptation after the session, such as the necessary adaptation of the game for the next session or the items linked to a meta cognition process (the need for static adaptation).

Flexibility thus consists in adapting the environment according to a particular context. One key item in the context description is the current status of the learners, and we believe that the *flexibility* relies strongly on the use of a *user model*.

Immersion

We also focus on the concept of *immersion* because it is fundamental in keeping coherency between the pedagogical content and the game itself. As a matter of fact, even in recent learning games, our experience shows that one particular point is rarely taken into account: the whole game design is not linked to the learning concepts. Therefore, students/players do not feel immersed in a world that is consequently not coherent for them.

In this chapter, we first give attention to these central aspects for motivation: *Flexibility* and *Immersion*. We then describe their application in “*Learning Adventure*”, our game-based environment.

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