

# Chapter 4

## Strategy to Implement Gamification in LMS

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### **ABSTRACT**

*The main goal of the chapter is to discuss implementation of the structural gamification in LMS. The overview of pedagogical approaches, theories, models, and systems connected to the serious games and in particular for gamification is presented. The possibilities for using the game elements and techniques in e-learning (incl. possible realization with the standard elements of a non-gamified LMS) are presented. A four-stage cyclical gamified learning model is proposed. For the four categories of learners from the Bartle’s classification, the appropriate game elements are determined. Two plugins for the application of structural gamification in Moodle have been designed and developed, which integrates game elements and techniques in the process of e-learning. The first plugin changes the design of the course into a game view. The second plugin allows adding specific game elements, which do not exist in Moodle. Different experiments of structural gamification have been done and presented.*

### **INTRODUCTION**

The current generation in the education system has grown up with Internet access and early use of computers, mobile devices and gaming devices. This group of learners has a different pattern of behavior in media consumption, communication and therefore different expectations in the educational environments. Passive consumption of learning content and traditional pedagogical methods “face to face” and “distance learning” are no longer sufficient for the new generation of learners (Chang & Guetl, 2010).

The modern generation of learners is active, searching and demanding, they want fast, attractive, quality and effective training that uses the latest technologies and tools. Contemporary learning must

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change / adapt pedagogical methods, approaches and strategies to meet the needs of these learners, as well as to use the technologies of learners.

Recently, one of the most studied pedagogical approaches is the application of games in the implementation of learning and more precisely the so-called serious games. This is no coincidence, because games are widespread in all age groups. Serious games are increasingly being integrated into school and university education and business learning.

Many scientists point to their strong motivating power. Moreover, not only the positive motivation (from success and receiving a reward), but also the negative one (from a bad result and not receiving a certain stimulus) are powerful triggers for the actions of the players.

Due to the large number of existing e-courses in the Learning Management Systems (LMS), the fastest and easiest way to apply the game methodology is by realizing the gamification of these e-courses.

The **main goal** of this chapter is to propose means (models, methods and tools) suitable for the organization of gamification of learning in LMSs for users of different types.

The study formulates and proves the following **hypothesis**: a possible approach to conducting gamified learning is the integration of modules (of the “plugin” type) to the appropriate LMS in which to create and use gamified learning e-courses.

In order to achieve the set goal of the research, the following four main tasks are planned and accomplished:

**Task 1:** Study of theories, models and systems related to the use of games in education and in particular its gamification;

**Task 2:** Creating a general model of the process for gamification of learning and methodology for developing gamified courses;

**Task 3:** Creating an approach for designing a system (module) to implement gamified learning in traditional LMS;

**Task 4:** Design, implementation and testing of software tools (module) for creating a gamified learning course, as well as for organizing and supporting gamified learning.

The second subchapter provides an overview in the following areas: serious games, in particular gamification of learning and examples of serious games in the LMSs, as well as pedagogical approaches, theories and models suitable for the gamification of learning. The possibilities for using the game elements and techniques in e-learning are presented in the third subchapter. The fourth subchapter proposes a four-stage cyclical learning model for structural gamification of learning. The implementation of structural gamification in a LMS is presented in the fifth subchapter, and the conducted gamification experiments are reflected in the sixth subchapter.

## **BACKGROUND**

### **Serious Games**

The use of game elements and techniques in learning aims to make complex theoretical learning more accessible. The practical activities in the games and their repetition lead to a deeper understanding of the learning content (Connolly et al., 2012).

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