Título: SUPPORTING PRACTITIONERS IN THE GAMIFICATION OF MOOCS THROUGH REWARD-BASED STRATEGIES

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Resumen: Massive Open Online Courses (MOOCs) have been established as a complement or alternative to other more traditional forms of teaching and learning (e.g., face-to-face, blended learning). Despite their relevant benefits (e.g., open access to education from prestigious universities), student disengagement has been identified as an important shortcoming, contributing to high drop out rates. In order to overcome this problem, reward-based gamification has been proposed as a promising strategy to increase student engagement in MOOCs, following its success in other small-scale educational contexts. However, the addition of gamification strategies implies a number of orchestration tasks (e.g., design, instantiation, management) that have to be carried by course practitioners (instructional designers, instructors, teacher assistants, etc.). Given this context, this dissertation aims to support MOOC practitioners in the design, instantiation and management of reward-based strategies in MOOC environments to promote students¿ engagement. To this end, this dissertation proposes the attainment of three goals by following the System Design Research Methodology.

The first goal deals with understanding whether reward-based strategies provide fruitful effects on student

engagement in MOOCs. The distinctive features of MOOCs (e.g., massive number of participants, participants¿ background heterogeneity, asynchronous interaction) might compromise the benefits observed in small-scale educational environments. A systematic literature review performed within the context of this dissertation, revealed a lack of empirical studies performed in real MOOC environments, thus hindering the understanding of how these strategies affect student engagement. In this sense, three empirical studies were carried out in the context of this dissertation. The three studies involved MOOCs that incorporated reward-based strategies, helping understand their effects, and gaining insights about potential design guidelines that might eventually be used by practitioners in the design of future MOOCs.

The second goal refers to the need of providing practitioners with computer-interpretable models to represent MOOC learning designs, incorporating reward-based strategies, thus supporting their automatic instantiation and management (e.g., reward-issuing procedure). A feature analysis of MOOC platforms and gamification systems identified their limited support regarding the representation of reward-based strategies in MOOC platforms¿ native tools. Given this context, this dissertation presents a data model (GamiTool-DM) that supports the computer-interpretable representation of reward-based strategies in MOOCs with a fine-grained level of detail, thus allowing to align practitioners¿ gamification purposes with the course pedagogical goals.

The aforementioned feature analysis also revealed that current MOOC platforms and gamification systems present some limitations regarding the cognitive and timely affordable orchestration of these strategies (e.g., usable authoring tool, automatic deployment and reward-issuing procedure). Consequently, the third goal of this dissertation aims to make cognitively and timely affordable for practitioners, the design, instantiation and management of reward-based strategies in MOOCs. In order to achieve this goal, this dissertation proposes a system (GamiTool), incorporating the previous data model and a system architecture (GamiTool-ARCH), supporting such affordable orchestration for a variety of MOOC platforms. A prototype of GamiTool (including GamiTool-DM and GamiTool-ARCH) has been iterative refined and evaluated with MOOC practitioners regarding the second and third goals of this dissertation. The results of these evaluation studies showed the accomplishment of such goals and relevant directions for future research in the area of gamification in MOOCs, and online educational environments.