An Ontology Engineering Approach to Gamify Collaborative Learning Scenarios

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Abstract

The design of collaborative learning (CL) scenarios that increase both students' learning and motivation is a challenge that the CSCL community has been addressing in the past few years. On one hand, CSCL design (i.e. scripts) has been shown to be effective to support meaningful interactions and better learning. On the other hand, scripted collaboration often does not motivate students to participate in the CL process, which makes more difficult the use of group activities over time. To deal with the problem of motivation, researchers and educators are now looking at gamification techniques to engage students. Gamification is an interesting concept that deals with the introduction and use of game design elements in a proper way to satisfy individual motivational needs. The use of gamification in educational settings is a complex task that requires, from instructional designers, knowledge about game elements (such as leaderboards and point systems), game design (e.g. how to combine game elements) and their impact on motivation and learning. Today, to the best of our knowledge, there are no approaches for the formal systematization of the instructional design knowledge about gamification and its application in CL scenarios. Thus, to address this issue, we have applied ontological engineering techniques to develop an Ontology called OntoGaCLeS. In this paper, we present the main concepts and ontological structure used to represent gamified CL

scenarios. In this ontology, we formalize the representation of gamification concepts and explain how they affect motivation in the context of collaborative learning. Particularly, we will focus on the definition of player roles and gameplay strategies. Furthermore, to show the utility of our approach, we illustrate how to use our ontology to define a personalized gamification model that is used to gamify a CL scenario based on motivational needs and individual traits of learners in a group.

Keywords

gamification ontology collaborative learning

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