Towards a Transformation Model of a Pedagogy Collaborative Project (PCP) Scenario

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Abstract—In this paper, we propose a meta-model for Pedagogy Collaborative Project (PCP) allows the teacher to develop a PCP scenario. The latter is able to be applied into a PCP scenario for a training platform that is not a priori designed for this teaching method. We describe an MDA (Model Driven Architecture) approach to develop transformation rules between the meta-model and the PCP training platform. To illustrate this proposal, the Moodle platform is chosen as a case study.

Keywords—Pedagogy Collaborative Project (PCP); MDA; Transformation rules; Atlas Transformation Language (ATL); Moodle

I. INTRODUCTION

The context of our research fits in the field of engineering e-learning systems. More specifically, we focus on the specification of learning situations in the context of Pedagogy Collaborative Project (PCP). The key in this method is that students work together in small teams from a specification for an effective production.

The specification of a learning situation in a context of PCP is described by a learning scenario. The latter represents the description, made a priori or a posteriori, the course of a learning unit for learning or for the appropriation of a specific set of knowledge, specifying the roles, activities and resources handling knowledge, tools, and services necessary for the implementation of activities [1].

The traditional engineering approach instrumented devices is focused mainly on mechanisms to facilitate (re) engineering, shift, and effective use of existing digital resources to support learning and teaching (depending on chosen platform). A new approach is recommended, from a learning scenario, lead to an apprenticeship system as a website for example.

To enable the teacher to develop a PCP scenario, we propose a dedicated PCP meta-model. This meta-model, briefly described in Section 2. The meta-model PCP is a proposal to offer an alternative to the limitations of existing approaches for expressing PCP scenario. In particular, most offered by IMS Global Learning Consortium, Instructional Management Systems Learning Design [2] [3], is not satisfactory for a teacher to express a PPC scenario. Many studies have been carried out and showed the limitations of this approach and the difficulty for non-specialist teachers in these languages, to formulate their needs [4] [5].

A meta-model is a language for modeling specific to a domain (Domain Specific Language), it is used to express the concepts common features within a single domain. It is built from informal models or recommendations in a natural language and semi-formal formally written in UML (Unified Modeling Language). This approach has been used in other works: the model learning language (CPL) (Cooperative Problem-based Learning Meta-model) is dedicated to PBL (Problem-based Learning) [6]. LDL (Learning Design Language) is based on a meta-model defined for CSCW [5].

To be "played" by the actors of the PCP, learning scenarios should be embedded in platforms. There are hundreds of commercial and open source platforms, but none of these platforms seems to be adapted to a learning situation in the context of the PCP. However, our strategy is to assist the teacher to implement the scenario PCP in the chosen target platform, rather than developing a new platform. Our work tries to reuse the existing platforms offer.

We propose an approach for model transformation [7], to integrate a PPC scenario in a training platform. In particular, we adopt the MDA (Model Driven Architecture) software engineering approach. This approach Object Management Group, based on models, at its center transformation technique models. This technique allows traceability between different models produced at different levels of abstraction. This should facilitate dialogue between the teacher, holder of knowledge of the situation of learning and pedagogical engineer, holder of knowledge of the platform. In this approach, the teacher conceptualizes the learning scenario based on the PCP meta-model. Then, the PCP scenario is adapted to the selected platform. To illustrate this proposal, the Moodle platform is chosen as a case study.

Figure 1 shows an overview of our proposal. The meta-model PPC is used by the teacher to enable him to develop his PCP scenario. The teacher should use the transform tool proposed for applying transformation rules model (explained in Part 4 of the article) to transform his PCP scenario to a PCP scenario able to be applied in Moodle. The latter provides the pedagogical engineer, responsible for deploying Moodle in order to be "played" by the actors of the PCP.