Personalization of MOOCs

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Abstract: One of the major challenges that the MOOCs must face is to provide learners with personalized learning paths. In this article we propose a model allowing the implementation of personalization in the context of MOOCs. Its purpose is to enable teachers and MOOCs designers to express their educational objectives in order to obtain an adaptation of the courses to everyone.

Keywords: MOOC, personalization, pedagogic strategy, adaptive learning.

Introduction

One of the main issues relating to MOOCs is due to the diversity of learners who join a MOOC: they significantly differ in age, education level, expectations, or learning habits. However, there is currently, in the vast majority of MOOCs, only one course offered to learners, and this single course does not necessarily suit all of them. As the number of learners in a MOOC is too important to rely on tutors, the personalization of learning, especially using learner profiles, may be the most effective solution.

Several studies with the goal of personalizing MOOCs have emerged in the past three years. These works provide automatic personalization processes, without involving the MOOC teaching team. Our approach is to give to the MOOC teaching team the possibility to define personalization strategies that will be implemented in the platform. Therefore, we propose to exploit the PERSUA2 model [1], originally proposed to personalize educational activities involving a single learner, especially those using ITSs. In this model, the teacher's role is to define a personalization strategy, as a set of pedagogical rules specifying which activities should be offered to a learner, based on the characteristics contained in his/her profile. Activities available in an ITS and the parameters enabling to choose or configure them are described in a model respecting the AKEPI meta-model [2]. The teacher also defines a context of use, which describes the situation in which learners will carry out the activities.

For each learner, the system implementing PERSUA2 can thus build activities that meet his/her characteristics (learner profile) according to the teacher's wishes (pedagogical strategy) and in the context of a given session (context of use).

As our aim is to use this model to personalize MOOCs, we studied its limits in this new context of application. The following section presents the PERSUA2_MOOC model allowing to overcome them.
PERSUA2_MOOC: a Model for Personalizing MOOCs

We specified a generic model for personalizing MOOCs, based on the PERSUA2 meta-model enabling the description of pedagogical strategies, and based on the AKEPI meta-model enabling the description of activities. This model specifies how to describe learner profiles, teaching strategies, context and activities within the MOOC. Our models of learner profiles and activities are not intended to be final and used necessarily as they are within a MOOC. They describe the general structure and the types of information they should contain. However, each MOOC platform having its own specificities, administrators can modify the elements contained in these models so that they best fit their system. Similarly, each MOOC is unique by its contents and objectives. The teaching team can then modify models of learner profiles and activities, in order to describe precisely the activities for a particular MOOC and the information to be obtained on learners when they perform these activities.

The different parts of the PERSUA2_MOOC model are used within an automated process, in order to provide recommendations to each learner. As input of the process are five elements. Two of them will be used to characterize the learner, and are calculated automatically using the activity traces: the profile, and the live context of use. This live context of use characterizes the learner, the platform and the MOOC at a particular time. The teaching team defines the other three elements: the pedagogical strategy, the description of activities and the sequence context of use. Like in the PERSUA2 model, a personalization strategy is a set of “IF-THEN-ELSE” rules. The conditions of these rules are constraints on the values of the elements of the learner profile. The consequences are lists of activities (constrained by some parameters), which are to be carried out by the learner if he/she satisfies (or not) these conditions. This process enables to obtain lists of personalized activities for each learner.

This model was instantiated for the FOVEA MOOC [3], and its operating process implemented as a web application. We were able to experiment all the components of our model with the authors of the MOOC, and check that their instantiation was possible, enabling finally to define a complete educational strategy and to generate lists of personalized activities for each learner. We also checked that our model enables to describe the activities proposed in the MOOC platforms Coursera, edX and Udacity.

Our approach places the teaching team at the center of the process of customization, enabling the adaptation of the MOOC to each learner, this personalization integrating all the functionalities offered on a MOOC platform. An important perspective of this work will be to provide the teaching team with feedback of learners’ activities, in order to judge the effectiveness of their pedagogical strategy.

References