

Searching and Recommending Didactic Material from a Teacher's Perspective

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ABSTRACT

In this contribution, we describe two main activities carried out in the field of intelligent systems for e-learning, with the aim of supporting teachers in the course building activity. The approach in this area is usually *student-centered*, but we start from the hypothesis that good teaching material and a good organization of the courses is the necessary condition for a fruitful learning process. So, we use a *teacher-centered* approach, starting from the needs of teachers who must package educational material. The most critical issues concern the research, reuse and reorganization of teaching materials, different for each educational objective. We present two systems developed in our laboratory: MoodleRec, a recommendation system built-in in Moodle that allows teachers to share materials based on their educational goals and teaching styles, and Wiki Course Builder, which produces courses starting from search in Wikipedia and that allows sequencing automatically the pages, according to the pre-requisite relation. The systems are available at <http://www.roma3ailab.it/>.

KEYWORDS

E-learning, LMS, Recommender Systems, Teacher Model

Context. The Web offers great opportunities in education, making an enormous wealth of learning resources available in a relatively easy way. For teachers, the Web can represent a rich field, where to find useful educational materials, suitable to enrich or to build a course.

The role of the teacher has changed, during time, also due to the effects of such a large availability of materials. Especially in e-learning, teachers can act as course constructors, and as facilitators, guiding the learner through educational experiences. Often, in addition, the variety of learning resources available on the Web, and the flexibility of modern Learning Management Systems (LMSs) can allow the teacher for some degrees of personalization of the learner's study experience.

The process of preparing a new online course is indeed very complex and time-consuming. In it, the teacher is involved in several tasks such as: i) building the concept map; ii) preparing and/or retrieving learning materials to include into the course; iii) building a didactic storyboard; iv) preparing the course delivery via the adopted LMS. We have developed two systems that help the

teacher in retrieving and rearranging didactic material while building courses.

MoodleRec [1] is a collaborative learning environment where Moodle, the most widely used LMS, offers the ground for searching and sharing Learning Objects (LOs). LOs are educational resources equipped with educational metadata that facilitate their retrieval. MoodleRec has a recommendation engine based on a hybrid approach: first, after the teacher submits the query related to the subject of interest, a content-based recommendation engine proposes a ranked list of LOs coming from different Learning Object Repositories. Then, by means of a collaborative filtering approach, the teacher can check how the listed LOs have been used by others in other courses by other teachers in the LMS. In this way s(he) can have useful insights coming from the way other colleagues have used that LO. The LOs selected by the teacher can be imported directly into the Moodle course. A real-life experimentation has shown that 61.4% of participants (teachers) were satisfied with MoodleRec and thought that the suggestions proposed by the system were useful.

Wiki course builder. Wikipedia is a free and open content online encyclopedia created through the collaboration of a community of users. The fact that each article is virtually subject to constant verification makes it a good candidate for the extraction of truthful information. Wiki Course Builder [2] is a virtual tutor which helps teachers to build courses starting from a query about the topic of interest. It searches on Wikipedia pages and shows the connection graph between the selected pages, represented as a direct graph. The selected pages will be automatically sequenced basing on the prerequisite relation, in order to provide a knowledge graph, editable by the teacher, with prerequisite and successor relations, representing the optimum learning path for the students. A field evaluation is ongoing, while the prerequisite relations among Wikipedia pages are discovered with a precision of 0.82 [2].

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