Preface

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Abstract. The 2nd Workshop on Recommender Systems for Technology Enhanced Learning (RecSysTEL 2012) presents the current status related to the design, development and evaluation of recommender systems in educational settings. It emphasizes the importance of recommender systems for Technology Enhanced Learning (TEL) to support learners with personalized learning resources and suitable peer learners to improve their learning process. 6 full papers and 3 short papers were accepted for publication, and 1 keynote speaker was invited to the workshop.

Keywords: Technology enhanced learning, recommender systems, educational guidance.

Introduction to RecSysTEL 2012

After the successful edition of the 1st Workshop on Recommender Systems for Technology Enhanced Learning (RecSysTEL 2010) [1] held in conjunction with the 5th European Conference on Technology Enhanced Learning (EC-TEL) and the 4th ACM Conference on Recommender Systems (RecSys), we have organized this second edition [2] in conjunction with the 7th European Conference on Technology Enhanced Learning (EC-TEL 2012).

Technology enhanced learning (TEL) aims to design, develop and test socio-technical innovations that will support and enhance learning practices of both individuals and organizations, supporting the creation and management of knowledge within organizational settings and communities. It is an application domain that generally addresses all types of technology research and development aiming to support of teaching and learning activities, and considers meta-cognitive and reflective skills such as self-management, self-motivation, and effective informal and

self-regulated learning. Information retrieval is a pivotal activity in TEL, and the deployment of recommender systems has attracted increased interest during the past years as it addresses the information overload problem in TEL scenarios with a low cost approach.

As already confirmed at RecSysTEL 2010, recommendation methods, techniques and systems open an interesting new approach to facilitate and support learning and teaching. There are plenty a resource available on the Web, in terms of digital learning content, services and people resources (e.g. other learners, experts, tutors) that can be used to facilitate teaching and learning tasks. The challenge is to develop, deploy and evaluate systems that provide learners and teachers with meaningful guidance in order to help identify suitable learning resources from a potentially overwhelming variety of choices.

The previous edition of the workshop moved a step forward in this research line, but there is still need for joining the ever increasing number of researchers working on TEL recommenders to share our progress and go further. By using recommendation technology, this workshop contributes to answer this edition EC-TEL research questions, refined as follows:

- How can TEL recommenders support people for the technology-rich workplace after they have left school?
- How can TEL recommenders promote informal and independent learning outside traditional educational settings?
- How can TEL recommenders apply next generation social and mobile technologies to promote informal and responsive learning?

In this context, several questions are being researched around the application of recommender systems in TEL, such as:

- Which are the user tasks that may be supported by recommender systems in TEL settings?
- What should be the focus of recommendation in TEL - resources, people or both?
- What are the requirements for the deployment of recommender systems in a TEL setting?
- What is needed to create a set of public available data sets ranging from formal to non-formal learning settings for TEL recommender systems?
- Can successful recommendation algorithms and systems from other application areas be applied in TEL and what should be the education related requirements taken into account when doing so?
- How to define evaluation criteria for TEL recommender systems?
- How can the success of SIR systems can be evaluated in the context of teaching, learning and/or TEL community building?

Next, we comment on the contributions of the workshop and acknowledge the support received both from organizations and people.

Contributions

The call for papers was disseminated in relevant lists and communities. We received 13 submissions, and each of them was reviewed using a blind refereeing process by 3 members of the Program Committee with expertise from both the RecSys and TEL communities. The reviewing process was carried out using Ginkgo submission system and took into account the following criteria: relevance, sound, organization and readability. In the end, 6 full papers and 3 short papers were accepted. Moreover, *Stefan Dietze* was invited as keynote speaker by the workshop organizers to share his experience with the participants on linked data as a facilitator for TEL recommender systems in research and practice. More specifically, his contribution focuses on providing an overview of most relevant linked data sources and techniques together with a discussion of their potential for the TEL domain in general and TEL recommender systems based on insights from related European projects, including mEducator and LinkedUp [3].

The accepted contributions covered several topics, such as recommendations in learning objects repositories, recommendations in learning scenarios and recommendations of human resources, the consideration of trust and affective issues in the recommendation process and the usage of different data formats in TEL recommenders. Moreover, the recommenders address both the needs of learners and educators.

In particular, the full papers address the following issues. *Cechinel et al.* describe the results of an experiment for automatically generating quality information about learning resources inside repositories in order to pursuit the automatic generation of internal quality information about resources inside repositories [4]. *Paquette et al.* address the problem of competency comparison, providing some heuristics to help match the competencies of users with those involved in task-based scenario components (actors, tasks, resources) and provide a context for recommendation through a learning scenario model and its web-based implementation [5]. *Manouselis et al.* investigate a real life implementation of a multi-criteria recommender system within a Web portal for organic and sustainable education and try to identify the needed adjustments that need to take place in order for it to better match the requirements of its operational environment [6]. *Fazeli et al.* focus on supporting the educators and propose a research approach to take advantage of the social data obtained from monitoring the activities of teachers while they are using a social recommender to find out what are the most suitable resources for their teaching practices [7]. *Koukourikos et al.* propose the introduction of sentiment analysis techniques on user comments regarding an educational resource in order to extract the opinion of a user for the quality of the latter and take into account its quality as perceived by the community before proposing the resource to another user [8]. *Santos and Boticario* discuss the benefits of considering affective issues in educational recommender systems and describe the extension of the Semantic Educational Recommender Systems (SERS) approach, which is characterized by its interoperability with e-learning services, to deal with learners' affective traits in educational scenarios [9].

In turn, the short papers deal with the following topics. *Anjorin et al.* present a framework to support the development of cross-platform recommender systems for

TEL ecosystems and discuss challenges faced, which was effectively applied to develop a cross-platform recommender system in a TEL ecosystem having Moodle as the Learning Management System, Mahara as the Social Networking Service and Ariadne as Learning Object Repository [10]. *Grandbastien et al.* review existing approaches for recommending resources in persona learning environments and describe a novel approach implemented in the OP4L prototype which combines Social Web presence data and semantic web technologies based on an intensive use of ontological models to represent the learning context [11]. *Niemann et al.* focus on the four most commonly used data representations and identify how they can be mapped onto one another to homogenize the usage of formats [12].

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