

Preface

This volume includes extended and revised versions of a set of selected works from the First International Workshop on Social Computing in Digital Education (SOCIALEDU), complemented by some chapters by invited researchers in this field of research. The workshop was hosted in conjunction with the ASE 8th International Conference on Social Computing (SOCIALCOM) on August 19, 2015, at Stanford University, USA.

The purpose of the SOCIALEDU workshops is to bring together researchers and practitioners in the field, and promote discussions around the state-of-the-art research and application of social computing for technology-enhanced learning. The workshop received contributions ranging from top-down experimental approaches and a bottom-up evolution of formal models and computational methods. The research and development discussed is a basis of innovative technologies that allow for intelligent applications, collaborative services, and methods to better understand the role social computing can play in education.

The workshops promoted international discussion forums with submissions from different regions and Program Committee members from many countries in Europe (the Netherlands, Portugal, Spain, Sweden, Germany), Asia and Oceania (Japan, Korea, New Zealand), and the Americas (Brazil, Colombia, USA).

The SOCIALEDU workshop received 10 submissions through the workshop website, from which we selected four full and three short presentations. Six of these papers were selected for publication as extended versions in this volume, together with three invited works. All the papers were reviewed by at least three different reviewers, and the works selected for this volume are representative of research projects around the aforementioned methods. The selections highlight the innovation and contribution to the state of the art, suggesting solutions to real-world problems and applications built upon the proposed technology.

In the first chapter, “Selection of Collaborative Learning Techniques Using Bloom’s Taxonomy”, Gómez and Moreno propose a recommender system for choosing the right technique in a collaborative learning scenario by matching the competencies required (as described using Bloom’s taxonomy) with the competencies that the collaborative learning activity is designed to develop. The work categorizes 26 different collaborative learning activities, and the design and testing of a recommender system for these activities. While collaborative learning has long been recognized as enhancing learning, it is not easy to incorporate such social activities into a regular classroom. Such a recommender system can help identify when a collaborative activity is useful, and what activity can be used; a conclusion they corroborate in their results.

The second chapter, “Gamification of Collaborative Learning Scenarios: Structuring Persuasive Strategies Using Game Elements and Ontologies,” by Chalco et al., introduces a structured systematization for representing concepts from gamification as used in collaborative learning, and a reasoning method for suggesting ways to gamify

collaborative learning scenarios. In particular they focus on gamification as a persuasive technology, and describe an ontological model to structure and organize persuasive strategies, allowing a system to match a user's personality type to specific techniques that can better engage him or her in a collaborative learning scenario.

In the third chapter, "A Full-Body Interaction Game for Children with Hearing Disabilities to Gain the Immersive Experience in a Puppet Show," Egusa et al. describe a novel physical-computational system in which children participate in an interactive puppet show. This puppet show was designed specifically to increase the appreciation of children with hearing disabilities by converting sounds into visual information, and allowing the children to participate through physical, rather than verbal, feedback. The authors present empirical evidence that the system is effective. Such work illustrates how computational techniques can adapt age-old teaching (and play) methods to be inclusive of people with disabilities, traditionally sidelined by such methods.

The fourth chapter, "A Learning Object Recommendation Model with User Mood Characteristics," by Pérez et al., presents a recommender system for learning objects that takes the user's emotions into account when making the recommendation. The technique combines a traditional test of learning style with a system for recognizing emotions, and uses the combination in a collaborative recommendation system to the best learning object for a specific subject.

The fifth chapter, "A Quantitative Analysis of Learning Objects and Their Metadata in Web Repositories," by Carvalho et al., presents a systematic review of the metadata available in different learning object repositories. They find that the organization and structuring of both learning objects and the metadata in online repositories is lacking and there is a lot of work to be done in order to use such repositories for computational reasoning. Despite various different standards for storing metadata, most learning objects are stored without even the most rudimentary metadata tags completed (often there is only a title to accompany a learning object). This systematic quantitative review is valuable for any work intending to use such metadata to select, search, or recommend learning objects automatically.

One such approach for selecting learning objects is described by de Amorim Junior and Silveira in the sixth chapter, titled "Towards an Intelligent Learning Objects-Based Model for Dynamic E-Learning Content Selection." They present an agent-based approach to allow for the adaptability and re-use of learning objects in distance learning applications. Building upon the SCORM API for learning objects and previous work on intelligent learning objects, the authors propose a multi-agent system that can adapt in real-time to student interactions with learning objects and provide alternative or supplementary material. This work incorporates techniques from intelligent tutoring systems, Semantic Web technologies, and multi-agent systems to provide a better way for searching and selecting learning objects.

In the seventh chapter, "The Socio-Cultural Approach to Software Engineering and Its Application to Modelling a Virtual Learning Environment," Gluz et al. present a novel methodology for software engineering, particularly designed for social applications. In this work they apply it in a case study for designing an educational application that selects and adapts learning objects based on ontological information about the learning objects, the student, the teacher's pedagogical strategy, and other information available in the virtual learning environment.

The eighth chapter, “New Moodle Blocks for Knowledge Management,” by Sprock and Vicari, proposes and evaluates novel plugins to allow for better knowledge management in the Moodle LMS system. In particular, they designed Yellow Pages, FAQ, and Lessons Learned modules, as well as a tool for monitoring students’ activities in Moodle, thereby making Moodle into a more collaborative tool for students as well as teachers.

Finally, the chapter “Experimental Evaluation on Machine Learning Techniques for Human Activities Recognition in Digital Education Context,” by Leitão et al., discusses how human activity recognition could be used in a classroom setting to enhance learning analytics, and evaluates a number of different algorithms to distinguish three basic physical activities in a classroom – e.g., sitting, walking, standing – using a cellphone. They find that the PART algorithm achieves good accuracy, and can be embedded in an application for use directly in a cellphone.

We would like to thank all the volunteers who made the workshops possible by helping to organize and peer review the submissions, and to EasyChair for the conference and proceedings management system.

March 2016

Andrew Koster
Fernando Koch
Tiago Primo

Social Computing in Digital Education
First International Workshop, SOCIALEDU 2015,
Stanford, CA, USA, August 19, 2015, Revised Selected
Papers
Koch, F.; Koster, A.; Tiago, P. (Eds.)
2016, XIII, 141 p. 72 illus., Softcover
ISBN: 978-3-319-39671-2