Software Advances in Education Computing

J.Á. Velázquez-Iturbide[1] and F.J. García-Peñalvo[2]

[1] Universidad Rey Juan Carlos, Madrid, Spain
[2] Universidad de Salamanca, Salamanca, Spain

Abstract—**This guest editorial is an introduction to a special issue with selected papers of SIIE'08, the X International Symposium of Computers in Education, held in Salamanca, Spain, in October 2008. The papers address different issues of software advances in education computing. In this introduction, we first provide an overview of the record of SIIE symposia. Then, we introduce the ten papers, classified into three streams: learning management systems, learning objects, and educational resources and tools.**

Index Terms—**Computers in education, learning management systems, learning objects, educational tools.**

I. INTRODUCTION

This issue contains a selection of ten papers from SIIE'08, the X International Symposium of Computers in Education (http://siie08.usal.es/). The set of papers here presented are strongly biased toward software technology.

SIIE is an international forum for the presentation and debate of the latest research advances on the use of Information and Communication Technologies in Education. It also aims at becoming a major point of contact between researchers, developers, institutional representatives and educators willing to share their points of view, knowledge and experiences.

The Symposium already has a long tradition and acknowledged prestige in Latin America, being currently a reference for Computers in Education. The first edition of SIIE was held in 1999 at Aveiro, Portugal. Since, it is alternatively held in Spain and Portugal. Editions held in Spain were organized by the Association for the Advancement of Computers in Education (Asociación para el Desarrollo de la Informática Educativa, ADIE, http://www.adie.es/) and a local university. Since the latest edition, SIIE will also be organized by the Spanish Chapter of the IEEE Education Society (http://www.ieec.uned.es/ES/).

A. X International Symposium of Computers in Education, SIIE'08

SIIE'08 (http://siie08.usal.es/) was held in Salamanca, Spain, 1-3 October 2008. In this edition, 165 submissions were received, which were subject to a double revision process by two members (and sometimes three or four) of the Program Committee or by additional reviewers pointed by them. A total of 69 submissions were accepted as papers and 20 as posters [1]. Consequently, a high level of quality of accepted submissions was guaranteed, similar to other prestigious conferences. The acceptance rate was 42% for papers and 54% if we also count posters. They dealt with many different topics, distributed in 21 paper sessions and 2 poster sessions. Authors of accepted submissions came from 12 countries: Spain, Portugal, Italy, Brazil, Colombia, Chile, Mexico, Germany, Argentina, Costa Rica, Cuba, Uruguay and Venezuela. We are glad to highlight the consolidation of research activity on computers in education in several Latin American countries, with more than one contribution to the Symposium program.

As in previous editions of the Symposium, we had plenary conferences given by two keynote speakers of international renown. We want to thank professors Claudio Dondi (of Scienter and President of EFQUEL) and Gorka Palacio (of Universidad del País Vasco, Spain) for having accepted our invitation to share their knowledge and experience in the areas where they are outstanding researchers.

The task of diffusion of research contents was not closed when the Symposium finished. Several selections of the best papers were made to publish in monographic issues. We present here a selection of ten papers that share a common interest in software technologies. The selection was made on the basis of scores obtained during the review process and their matter.

II. THIS ISSUE

The ten papers selected are briefly described in this Section, grouped into three categories.

A. Learning Management Systems

Nowadays, learning management systems (LMS) are one of the main components, if not the main one, in the software organization of many educational institutions. A first group of papers deals with these systems.

The first paper, by Fontenla-González, Caeiro-Rodríguez and Llamas-Nistal, proposes a generalized architecture of LMSs. The proposal is aimed at increasing reusability, by facilitating the integration of educational tools in LMSs. It is based on the educational modeling language PoEML.

The second paper, by Pérez-Rodríguez, Caeiro-Rodríguez and Anodo-Rifón, is also based on the educational modeling language PoEML. A design principle of PoEML is separation of concerns. The paper describes support to the structural, functional, order and temporal perspectives of PoEML.

B. Learning Objects

A second group of selected papers deal with learning objects (LOs), as the main technology for standardized sharing of educational resources.

The paper by Sarasa *et* al. deals with Agrega, a Spanish, official network of digital resources with one node per region. Digital objects are marked-up with

metainformation to facilitate their handling and retrieval. In particular, Agrega uses a profile of application of LOM that requires classifying objects according to a set of taxonomies and a thesaurus. The authors describe their experience using IMS VDEX for this task.

The paper by Morales-Morgado, Gómez Aguilar and García-Peñalvo addresses the evaluation of LOs quality. The main feature of their work is that the results of expert and user evaluations are made publicly made available. Thus, experts can make more reasoned decisions based on others' evaluations. They identify different aspects amenable to be evaluated and describe their implementation within Moodle.

The paper by Sanz-Rodríguez, Dodero and Sánchez-Alonso deals with object reuse. Reusability is a feature that can a priori provide metrics of the quality of a LO. However, reusing an object is an empiric measure that can be compiled from its actual use. The objective of their work is to identify a priori metrics of LOs most consistent with their actual reuse. Such metrics can be useful both to producers and consumers of LOs.

The fourth paper, by Gómez-Albarrán and Jiménez-Díaz, deals with retrieval of LOs. They make a proposal for LOs recommendation to students. Their approach combines content-based filtering mechanisms and collaborative (or social) filtering processes. The approach is further supported by students' facilities to score existing LOs and to suggest incorporating new LOs.

C. Educational Resources and Tools

The third group of papers is related to different educational tools.

The paper by Alves *et al.* performs a study on information and telecommunication technologies at the primary and secondary educative levels. They are illustrative of official initiatives to promote new technologies, here about Portugal.

The paper by Prieto-Blázquez and Herrera-Joancomartí proposes an integrated structure for virtual laboratories for undergraduate degree programmes in Computer Engineering and Software Engineering. This general structure is based on their experience in designing and developing virtual laboratories in a virtual university. Technological, pedagogical, strategic and academic staff resources are included in the virtual laboratories structure. The paper also presents the application of the structure to a virtual programming laboratory and the results of evaluating its effectiveness by students.

The paper by Duque *et al.* addresses the issue of observing the activity of students in CSCL environments, including both actions and products. They propose a methodical approach to design automated mechanisms to watch activity. The approach provides the designer with specific procedures to design observation systems that process and store all the information necessary to analyze students' activity. They exemplify their approach by designing an observation system within the CSCL environment SPACE-DESIGN.

The last paper is authored by Iriarte Díaz-Granados *et al.* and lies in the field of adaptive hypermedia and learning styles. They report on a study to determine the effect of several factors over the academic success of students, mainly their learning style. The study concludes that the main influencing factors were motivation and learning style. In addition, differences in the use of on-line materials were also due to their learning styles.

REFERENCES

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EDITORS

J. Á. Velázquez-Iturbide is with the Universidad Rey Juan Carlos, Madrid, Spain (e-mail: angel.velazquez@ urjc.es).

F. C. García-Peñalvo is with the Universidad de Salamanca, Salamanca, Spain (e-mail: fgarcia@usal.es).