SPECIAL FOCUS **ALICE 2015**

"Learning Analytics and e-Assessment for Adaptive e-Learning via Interactive, Collaborative and Emotional systems"

Despite a great potential and some initial successes, e-learning systems do not yet have the impact that many believe is possible. Moreover, the gap seems to be increasing because of the greater expectations of the current generation (Digital Natives) who have grown up with modern technology.

There are also more general problems. In particular, an over-emphasis on cost effectiveness has meant that content is often not as strong as it needs to be and this deficiency has contributed to a lack of user engagement and some high attrition rates. Studies have consistently highlighted the important relationship between engagement and learning, with students who are highly motivated being more likely to engage in the learning process.

This Special Issue aims at presenting innovative adaptive e-learning combining personalization, collaboration and simulation aspects within an affective/emotional based approach able to contribute to the overcoming of the quoted limitations of current e-learning systems and content. Special emphasis is given to environments that are interactive, challenging and context aware while enabling learners' demand of empowerment, social identity, and authentic learning experience.

The expected contributions should be able to effectively involve learners in educational, cultural and informative activities. Empirical results from real users in real learning and training settings will be very valuable in order to evaluate and discuss the impact of the proposed innovative features.

This Special Focus Issue follows the **Fifth International Workshop on Adaptive Learning via Interactive, Collaborative and Emotional approaches (ALICE 2015)** in conjunction with the Seventh International Conference on Intelligent Networking and Collaborative Systems (INCOS 2015), held in Taipei, Taiwan, September 2-4, 2015. The theme of the Workshop ALICE 2015 and this special issue is partially supported by the FP7 European project called ALICE. Web page of the WS ALICE: http://www.capuano.biz/alice/2015.html

Five quality articles make up this special issue with proposals able to effectively involve learners in educational, cultural and informative activities based on learning analytics and e-assessment. Empirical results from real users in real learning and training settings are very valuable and provide practical evaluation as well useful discussion on the impact of the proposed innovative features for enhancing and improving the e-Learning experience.

In particular, the first article by Hernández et al., investigates on social network learning analytics, which aims to extract useful information to improve the learning process, but the variety of learning management systems makes this task burdensome and difficult to manage. To this end, the authors show how Gephi, a general-purpose, open-source social network analysis application, can be used by instructors and institutions to extract and visualize relevant information that is commonly hidden or difficult to observe for course coordinators and teachers. The empirical case study uses data from one cross-curricular course with 656 students at the Open University of Catalonia and showcases the use of Gephi as a social network learning analytics tool. The study further discusses on the potential of social network learning analytics to improve online instruction by visualization of educational data.

The second article by Baneres et al., addresses the topic of e-assessment and in particular assessment activities that are used to check the level of expertise of the learner and evaluate whether students have acquired the knowledge and competences provided in the course. The authors claim the evaluation should be performed by evaluating their progression by means of the interaction in the classroom or assessment activities. Typically, the assessment model and assessment activities of subjects in official programs are the same for all the learners, since they should be evaluated having the same opportunities and conditions. However, when learners are evaluated based on a continuous assessment model, they are demonstrating on each activity their knowledge and proficiency level and, at the same time, their reputation could also be built based on the actions each student is performing within the course. Therefore, the assessment model can be particularly adapted to each learner based on this information. To this end, the authors present a general system to adapt any component of the assessment process (model, activity, question…) based on different evidences gathered from the learning process of the learner.

Capuano et al., in the third article, investigate on peer grading, which is an approach increasingly adopted for assessing students in massive on-line courses, especially for complex assignments where automatic assessment is impossible and the ability of tutors to evaluate and provide feedback at scale is limited. The authors claim that as students may have different expertise, peer grading often does not deliver accurate results compared to human tutors. To this end, the

authors describe and compare different methods, based on graph mining techniques, aimed at mitigating this issue by combining peer grades on the basis of the detected expertise of the assessor students. The possibility to improve these results through optimized techniques for assessors' assignment is also discussed in the article. Experimental results with both synthetic and real data are presented and show better performance of our methods in comparison to other existing approaches.

The fourth article by Guitart and Conesa discuss on the topic of business intelligence and analytic techniques implemented in competitive organizations in order to help employees in the process of evidence-based decision-making. The authors claim that using these systems in university provide a set of analytical tools that support decision-making of academics focused to the improvement of their research and teaching activities. To implement these systems efficiently it is necessary to gather data about the activities students and teachers perform during the learning-teaching process. Currently, most universities provide virtual learning environments where students perform most of their learning activities. These environments may store data about the interaction of their users and, therefore, gather information of all the agents during the teaching-learning process. The authors propose to adopt the strategies of business intelligence, which result useful in organizations, to universities. By applying analytic techniques on the large volume of data stored in the VLE, the authors propose to build dashboards for teachers and academic program managers in order to help them to take decisions that improve teaching in the short, medium and long term.

The fifth and last article by Mora et al., presents a virtualization process of live collaborative learning sessions from Web discussion forums and chats with the aim to produce interactive and attractive online learning resources to be played by learners, thus having a positive effect in learner engagement. In order to enhance further learning engagement, the authors propose to endow their virtualization process with a multifold assessment framework that provides effective awareness and constructive feedback to learners from the original collaborative interactions amongst group members. The re-search here presented focuses on e-assessment of collaborative and social learning and extends it with Learning Analytics and Social Network Analysis techniques that are able to analyze and represent cognitive and social interactions underlying live collaborative sessions. The interaction data extracted from collaborative knowledge and social networking is then integrated into the virtualized collaborative learning to produce an efficient and personalized awareness and feedback system about the collaborative activity and the social behavior of the original participants of live collaboration. The authors describe both the conceptual and methodological research to build our multi-fold e-assessment framework. The research is finally evaluated in real context of e-learning and validated by empirical data and interpretation.

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