Guest Editorial Preface

Special Issue on Visual Aspects in Technology Enhanced Learning

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INTRODUCTION

Technology Enhanced Learning (TEL) is growing towards the integration and support of a variety of tools and technologies, related to learning and teaching activities: authoring tools for learning objects, management and evaluation of the relations holding among the learning objects collected in a repository, management of student models, multifaceted interaction with instructional material, the delivery of practical learning experiences and management of their assessment. This growth extends, nowadays, towards game-based and social-collaborative e-learning (Burguillo, 2010; Hsiao & Brusilovsky, 2012), allowing to extend the range of pedagogical approaches tackled in TEL.

In parallel with this evolution, the "aspects" related to the visualization of information are growing steadily, in both importance and complexity (Hsiao et al., 2011).

They, basically, allow to make conscious use of the variously faceted amount of information collected in a learning system, such as the content of student models, the activity logs, or the performance representation.

ARTICLE OVERVIEW

The first two contributions present specific tools aiming at improving the current state of the art in distance education by means of visual technologies. In the first journal article Damiano Distante, Kirsi Kuosa, Anne-Maritta Tervakari, Luigi Cerulo, Alejandro Fernandez, Juho Koro, and Meri Kailanto present two interactive visualization tools for learning management systems (LMS): the first one build interactive visualizations to analyze students' activity from automatically recorded user log data; the second tool extends navigation and search functionalities in the discussion forum of an LMS by adding a topic-driven navigation structure and an interactive search graph.

In the following article Marjan Gusev, Sasko Ristov, and Goce Armenski discuss the problem of the e-Assessment and, in particular, they propose several technologies that can help the teachers to develop a huge database of questions with a minimal effort. The technologies they propose allow both the traditional e-Assessment with usual multiple-choice answers and the new e-Assessment with interactive images.

The next two contributes exemplify situations where a visual approach is adopted in order to strengthen learning. In the third article Tania Di Mascio, Laura Tarantino, Pierpaolo Vittorini, Rosella Gennari, Alessandra Melonio present the system they developed to support children in mastering the temporal relations of stories: the system has a "read & play" graphical approach that offers the children a playful and enjoyable interaction experience.

Subsequently, Nguyen Duc Thien, Annalisa Terracina, Luca Iocchi, and Massimo Mecella have an original approach in which the visual part is due to a robotic arm that shows students how to solve the "Tower of Hanoi" problem; the authors discuss the results of an experiment that confirm the effectiveness of this approach.

In the last two articles, with different perspectives, visualization is related to the effectiveness of technology enhanced learning activities. In particular, in the fifth paper, Minoru Nakayama uses visualization to conduct a quantitative comparison of contents of the notes taken by students during a blended learning course. Possible applications, for visualizing learning activities of the lecturer and students, are discussed.

In the last paper, Fiona Carroll and Rita Kop explore the role of visual aesthetics in improving engagement in online learning: their opinion is that, in TEL, the focus so far has been mainly on usability, and weakly on the aesthetics. They discuss the challenges of aesthetics in TEL, which lie mainly in finding a way to fully address the needs of the visual learner.

CONCLUSION AND ACKNOWLEDGMENT

As the guest editors, we would like to thank all the authors and reviewers that contributed to the preparation of this special issue. We would also like to thank the IJEDT Executive Editor Prof. Maiga Chang, for his assistance and his patience.

We do believe that visual aspects are crucial for the effectiveness of modern TEL systems, and hope that this special issue can contribute to the development of new techniques in these systems.

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