

Editorial

Charalampos Karagiannidis and Sabine Graf, Co-Editors
Davinia Hernández-Leo, Guest Editor

Welcome to the Bulletin of the IEEE Technical Committee on Learning Technology, Volume 14, Number 4, October 2012 issue.

This is the first issue which implements the decisions made in the last board meeting of the Technical Committee on Learning Technology during the 2012 International Conference on Advanced Learning Technologies (ICALT) in Rome. In particular, the name of the publication is changed to *Bulletin of the IEEE Technical Committee on Learning Technology*, the formatting of the articles is modified to comply with IEEE guidelines and the length of the articles is extended to 4 pages.

This issue is edited by Guest Editor Prof. **Davinia Hernández-Leo**, and includes articles on *Technology-Augmented Physical Educational Spaces*.

The issue also includes a section with regular articles (i.e. articles that are not related to the special theme). In this regular section, So & Lam describe a study which examines how Facebook is being used as a platform to communicate and to foster participation and interaction between students and other parties. Vu & Fadde describe a study which examines what characteristics, factors, traits, and classroom behaviors make an effective instructor in an online learning environment.

We sincerely hope that the issue will help in keeping you abreast of the current research and developments in Learning Technology. We also would like to take the opportunity to invite you to contribute your own work (e.g. work in progress, project reports, dissertation abstracts, case studies, event announcements) in this Bulletin, if you are involved in research and/or implementation of any aspect of advanced learning technology. For more details, please refer to the author guidelines at <http://www.ieeetclt.org/content/bulletin>.

Special theme of the next issue: “Eliminating boundaries: innovative learning environments to integrate formal, informal and on-the-move learning experiences”

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Deadline for submission of articles: January 10, 2013

Articles that are not in the area of the special theme are most welcome as well and will be published in the regular article section.

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SPECIAL ISSUE ON TECHNOLOGY-AUGMENTED PHYSICAL EDUCATIONAL SPACES

The introduction of technologies in physical educational spaces has brought new possibilities to education that are transforming the learning scenarios. Computational artifacts have moved from being conceived as a means to support distance communication to be elements embedded in augmented physical spaces that can enrich face-to-face learning experiences [2, 5].

Augmented physical educational spaces go beyond the desktop computing by using interactive artifacts and technological facilities derived from: tangible interfaces, mobile and ubiquitous computing, and augmented reality. In tangible user interfaces a person interacts with digital information through the physical environment. This type of interaction involves explicit contact with the computing artefacts [1]. Ubiquitous computing deals with situating and embedding devices (RFID, QR codes, location-aware services...) within a space so that computational power is available everywhere (wearable devices, roomware, mobile phones, ...) and the interaction with the devices is mediated through this space [3, 4]. These devices can also facilitate augmented reality scenarios, overlaying digital information to real objects to enhance the learning benefits.

The special theme of this issue focuses on the improvement and application of information and communication technologies to augment physical spaces for teaching and learning purposes. It includes 13 papers with authors of 8 different countries: USA, Canada, Israel, UK, Greece, Finland, Norway and Spain. The majority of the papers describe current research on specific technological approaches (tabletops, augmented reality, mobile learning, affective computing and backchannels) that enhance educational physical environments, while two papers call for reflection about teacher training/adoption challenges and the need of further advances in learning theory to understand the nature of our interactions with technology-augmented physical spaces.

In “A glimpse to the ambient classroom,” Asterios Leonidis, Maria Korozi, George Margetis, Stavroula Ntoa, Margherita Antona and Constantine Stephanidis present several different technological solutions (an augmented desk, a study table, a tabletop for mini-games,...) that augment physical educational materials traditionally used in a classroom setting: books and paper cards. Similarly, Fotis Liarokapis describes a low cost Augmented Reality technology to provide students with an interactive augmentation of teaching material focused on computer graphics principles in his paper “Augmented Reality Interfaces for Assisting Computer Games University Students.” With the

additional aim of promoting creativity, Michail N. Giannakos, Letizia Jaccheri, and Ioannis Leftheriotis in “Learning and Creativity through Tabletops: A Learning Analytics Approach,” use tabletop applications in workshops to learn geometry in a creative context. Their approach includes the collection of extensive data that can be triangulated to offer a deep understanding of the learning behavior.

The integration of activities supported by augmented reality technologies with other types of activities is the focus of the paper “Orchestrating TEL situations across spaces using Augmented Reality through GLUE!-PS AR,” by Juan A. Muñoz-Cristóbal, Luis P. Prieto, Juan I. Asensio-Pérez, Iván M. Jorrín-Abellán, and Yannis Dimitriadis. GLUE!-PS AR allows the automatic deployment of activities defined using multiple learning design authoring tools in widespread Virtual Learning Environments and Augmented Reality browsers.

Full-body motion as an integral means through which students express thoughts and meanings is studied by Zacharoula G. Smyrniou and Chronis Kynigos in “Interactive Movement and Talk in Generating Meanings from Science,” where they apply kinaesthetic recognition of movement to enable bodily expression interaction with a collaborative digital game.

There are four papers in this issue centered on mobile learning. In “Routes of geolocated questions in formal and informal learning contexts,” Patricia Santos, Mar Pérez-Sanagustín, Davinia Hernández-Leo, and Josep Blat describe three educational scenarios placed in different contexts that use the QuesTInSitu tool to design, enact and monitor interactive routes of questions for learning and (automatic) assessment in situ. From a perspective of game-based learning, D. Kohen-Vacs, M. Ronen, and S. Cohen in “Mobile treasure hunt games,” introduce a mobile learning application that enables teachers to geolocate clues that can direct the students to specific places and activities. M. Pérez-Sanagustín, A. Martínez, and C. Delgado Kloos present a more general solution that supports the design and enactment of mobile learning scenarios based on digital tags (QR codes, NFC) in their paper “etiquetAR: a tool for designing tag-based mobile augmented learning experiences.” Finally, design and quality issues of mobile learning activities are discussed by Abdalha Ali, Abdelkader Ouda, Luiz Fernando Capretz in “A Conceptual Framework for Measuring the Quality Aspects of Mobile Learning”.

To enrich educational settings, the MAMIPEC project aims at applying devices for affective computing that can enable more inclusive personalized activities. Olga C. Santos, Jesus G. Boticario, Miguel Arevalillo-Herráez, Mar Saneiro, Raul Cabestrero, Elena del Campo, Angeles Manjarres, Paloma Moreno, Pilar Quiros, and Sergio Salmeron explain the project in “MAMIPEC – Affective Modeling in Inclusive Personalized Educational Scenarios.” The integration of a classroom discussion backchannel is the objective of John M. Carroll, Honglu Du, Hao Jiang, Mary Beth Rosson, who in “ClassConversations: Keeping The Learning Conversation

Going,” describe how they combine a real-time chat among students that is publicly displayed during the class with an asynchronous knowledge-building forum.

Elisabeth FitzGerald in “Towards a theory of augmented place,” inspires debate around the theoretical perspectives underpinning research into technology-augmented educational spaces, and the engagement by students with blended environments/spaces. This discussion is complemented by the paper “Facing Challenges with New Teachers’ Use of ICT in Teaching and Learning” authored by Teemu Valtonen, Kati Mäkitalo-Siegl, Sini Kontkanen, Susanna Pöntinen, and Henriikka Vartiainen, who present a realistic view of challenges and needs for teachers’ skills development to promote the use of technology-enriched spaces in pedagogically meaningful ways.

On the whole, this collection of papers represents an overview of different approaches where ICT can be used to enhance learning by augmenting reality or/and enabling complementary or richer activities in classroom and open spaces. The technologies are available and their potential is clear, now research challenges rely on a deeper understanding of their interactive and learning value. This profound understanding would enable the refinement of these technologies, the associated pedagogical methods, and the required teachers’ competence development actions.

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