VIRTUAL AND AUGMENTED REALITY FOR ENHANCED EXPERIENCE IN EDUCATION AND LEARNING

Overview

Virtual reality brings changes not only in everyday life of society but also change the education, the way how people learn, the way how they acquire knowledge and there are changes needed in the ways how to teach and how to assess the knowledge. In context of virtual reality pedagogy science experiences significant transformations. The pedagogy goes away from local teaching to translocal teaching because the virtual world gives the possibility not to be connected with the physical environment. The socialization process and the environment are partly transformed as well the formation of virtual communities takes place which, in its turn, advances new challenges to the teaching and learning process.

Virtual reality (VR) id defined as I3 for "Immersion-Interaction-Imagination" by Burdea and Coiffet (2003). There are some ideas to use 3-D VW model (Dalgarno and Lee, 2010) for learning, but Fowler points out that model of learning in 3-D VWs is the illusion of three dimensions. One of risks with high-fidelity 3-D VLEs is that they will be used to create virtual classrooms that "feel" and look like real classrooms but lose the opportunity to create pedagogically new and innovative learning environments. The same can be said about all other technological innovations in educational space.

Fowler (2015) indicates, that in most cases when researchers talk about virtual education (VE) mainly taken into account the technological perspective, specifically through the identification of learning benefits that arise from the technical affordances, but there is no deep analyses of pedagogical benefits. Jonassen (2000) says that technologies have intrinsic properties and activate cognitive tools that help learners to consciously elaborate on what they are thinking and to engage in meaningful learning. Therefore, a VR environment triggers the human mind's capacity to perceive, imagine in a creative sense, nonexistent things.

The evolution of Virtual and Augmented Reality Research in the last decade is tremendous. Its capacity to provide meaningful enrichments of the perceived reality with digital elements has many implications and various interpretations. In terms of services and applications Augmented Reality promotes a new integrative visual approach to content and context integration. The exploitation of Augmented and Virtual Reality for educational purposes gains significant interest as well. The capacity of the technology to promote motivating learning scenarios and interfaces and the need of the educational world to respond to several problematic facts is extremely important.

Researchers should start scientific discussions on virtual reality in education and use of apps immediately to find out where virtual reality enabled learning environment is as scaffolding tool to ensure learning outcomes and where there are only novelty and placebo effects as Fowler points out (Fowler, 2015).

The **objective** of the special issue is to communicate and disseminate recent researches on use of Virtual and Augmented Reality enabled educational applications to promote knowledge development and enhanced learners experience. Virtual Reality for Education is very innovative and wide aspect of educational sciences which should be discussed very broadly and requires new researches. This special issue can be a starting point for developing the new series of researches, journal publications, maybe even new regular journal and books.

The thematic areas for the special issue focus are linked to the following aspects of VR/AR integration in Education

Aspects	Main Research topics	Intended Contributions
Content	- Standardization - Metadata enrichment - VR authoring - Interoperability in different platforms - Modularity & openness	- Methods and algorithms for content modularization - Open environments and platforms for AR/VR authoring - Systems of Systems enabling dynamic content exploration in AR/VR settings - Dynamic Annotation of VR/AR content - Cognitive computing integration to VR/AR educational systems
Context	- Dynamic profiling - VR media enrichment - Customization of VR/AR experience - Learning Dimensions and value components - Distributed Learning context - Integration of multiple contexts	- Methodologies for Educational Profiling in VR systems - Methodologies for media richness in Educational VR - Models of Students' Value Perceptions for VR context - Methodologies for the integration of active learning in VR learning spaces
Tools	- VR/AR learning authoring tools 3D visualization tools - Haptic Technologies Integration - Management of motion and kinesthetic - Community, Social Networks, Sensor Networks over VR/AR systems	- Innovative learning AR/VR authoring environments - Prototype systems integrating Haptic and Kinesthetic management for training and learning - Integrative solutions of AR/VR and SNs for learning
Interactions	- Emerging AR/VR interactions - Trial and Error interactions - Skills building AR/VR interactions - Cognitive interactions - Interpretations of	- Proposition of sound, learning interactions promoting learning strategies in the VR/AR learning space - Workflow models and analytics for learning interactions in VR/AR - Prototype systems measuring the

	connectivism and constructionism in VR/ AR environments • Modelling AR/VR interactions	effectiveness of VR/AR to deliver learning value
Virtual Reality Value Integrators	• Presence • Distance • Media Enhancement • Feelings and Sentiments • Excitement / Motivation • Engagement /	• Innovative approaches to managing presence in VR/AR learning spaces • Algorithms, and Methodologies for managing feelings, sentiments, engagement and intrinsic motivation in VR/AR learning spaces
Augmented Integration	• Physical Space Enhancement • Learning VR/AR artifacts as integrators of experience • Context Awareness in Augmented Mode • Ubiquitous transparent Interfaces • Learning Centric activation of AR value services	• Intelligent activation of Augmented Reality Learning enhancements in physical spaces • Algorithms for targeting augmented reality content in STEM Labs • Augmented Reality for Learning and Smartphones Integration • Sensor Networks as enabling infrastructures for AR integration.

The following thus are a few indicative topics:

- Self-driven or team-driven customized content / Learning experiences in VR/AR for Education
- Community driven content in AR/VR learning environments
- 3-tier approach VR Content enriched with Social Media community contributions
- Integrated component for VR content Authoring and multiformat delivery
- Group-based / Team Based VR learning stories authoring approaches
- Game based production of VR Learning content
- Matching different AR/VR context to learners' profiles
- Automatic enhancement of learning experience with AR/VR objects
- Scalable delivery of learning value and complexity through diverse AR/VR techniques
- Integration of learning labs with other applications and open architectures e.g. Cultural Archives, Social Networks, Public Profiles etc
- Design of Distributed Shared AR/VR learning contents for remote use and for distant use.
- Exemplary applications for Haptic Integration and Kinesthetic in VR/AR educational spaces
- Blooms Taxonomy of Learning Objectives and Pool of related VR/AR interactions
- Skills building and competencies building wizards for VR/AR learning experiences
- Tools for promoting Excitement / Motivation for use
- Smartphone application and client-side interface for using augmented reality services

Important Dates:

Submission Deadline: 7th October, 2017
Authors Notification/ Decision: 10th December, 2017
Final Versions Due: 5th February, 2018

Submission Procedure

Authors should follow the VIRTUAL REALITY manuscript format described at:
http://www.springer.com/computer/image+processing/journal/10055?detailsPage=pltci_1060360.
Manuscripts should be submitted on-line through
https://www.editorialmanager.com/vire/default.aspx

Guest Editors

Linda Daniela, University of Latvia, LATVIA, linda.daniela@lu.lv
Miltiadis D. Lytras, Deree College – The American College of Greece, GREECE, mlytras@acg.edu

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