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# Immersive Learning Research

# J.UCS Special Issue

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Welcome to the Journal of Universal Computer Science (J.UCS) special issue organized by the Immersive Learning Research Network (iLRN) following the 2017 iLRN conference. This issue includes eight papers on the focused topic "*Immersive Learning Research*", including extended versions of papers presented at iLRN 2017 and articles from the public call for papers.

We are grateful for all reviewers and authors who took part in the creation of this special issue. Your important support and work is what gave this special issue rigor and quality. Also, special thanks to Filipe Penicheiro, our editorial assistant for the issue and co-author of this foreword, who spent countless hours formatting submissions and communicating with authors. And we would also like to thank the members of the J.UCS consortium which allows J. UCS to continue to be an open content journal.

This special issue displays the multicultural strength of iLRN, featuring authors from Brazil, Chile, Finland, Germany, Netherlands, Saudi Arabia, Sri Lanka, United Kingdom, and the United States of America. It also features eight papers on a topic that we know best – creation and evaluation of effective immersive learning experiences by diverse researchers across interdisciplinary contexts.

The paper "The Sense of Presence Exploration in Virtual Reality Therapy" by Max M. North and Sarah M. North explores the sense of presence that participants experience in Virtual Reality Therapy experiments. In this article, sense of presence is briefly defined, followed by a discussion of factors effecting sense of presence, continuing with methods to measure sense of presence and assertions concerning virtual presence, and finally, conclusions and discussions are presented.

The paper "Do you Want to be a Superhero? Boosting Emotional States with the Booth" by Jan Schneider, Dirk Börner, Peter Van Rosmalen, and Marcus Specht presents and evaluates The Booth, an application designed to get learners into a powerful and resourceful emotional state. Evaluation includes a two-step user study, showing that use of the Booth induced a positive emotional state on users, and that using the Booth helps learners emotionally prepare for public speaking.

The paper "From AR to Expertise: A User Study of an Augmented Reality Training to Support Expertise Development" by Bibeg Hang Limbu, Halszka Jarodzka, Roland Klemke, Fridolin Wild, and Marcus Specht reports on the user study of an augmented reality prototype developed to support students to learn from trainers in professional domains using augmented reality and sensors. Results show potential to be used in a variety of domains to support development of expertise.

The paper "Effective Learning Content Offering in MOOCs with Virtual Reality – An Exploratory Study on Learner Experience" by Supun Hewawalpita, Sachini Herath, Indika Perera, and Dulani Meedeniya. compared a MOOC with virtual reality (VR) support and a standard video based MOOC learner support. The study found that students who used the VR MOOC had significant better performance than the students in the video based MOOC.

The paper "Development of a Software that Supports Multimodal Learning Analytics: A Case Study on Oral Presentations" by Robert Munoz, Rodolfo Villarroel, Thiago S. Barcelos, Alexandra Souza, Erik Merino, Rodolfo Guiñez, and Leandro A. Silva reports on the development of a tool to measure the development of complex skills in real classroom environments that is flexible enough to add and process data from different sensors. The evaluation showed promise in use as a feedback tool for teachers during student oral presentations.

The paper "Mixed Agents Virtual Observation Lenses for Immersive Learning Environments" by Samah Felemban, Michael Gardner, Victor Callahan, and Anasol Peña-Rios developed a virtual observation model for mapping classroom observations to how people can be evaluated in virtual 3D environments. Their work holds promise for demonstrating the learning affordances inherent in 3D virtual world environments.

The paper "A Technology Acceptance Model for Augmented Reality and Wearable Technologies" by Will Guest, Fridolin Wild, Alla Vovk, Paul Lefrere, Roland Klemke, Mikhail Fominykh, and Timo Kuula investigated the use of wearable technology to improve human task performance. It explores the wearable technology in an aviation, medical, and space environment.

The paper "Comparing Learning in Virtual Reality with Learning on a 2D Screen Using Electrostatics Activities" by Scott W. Greenwald, Wiley Corning, Markus Funk, and Pattie Maes compared learning a VR learning environment with a traditional 2D learning environment focusing on helping learners understand the concepts of electricity and magnetism. The VR environment was found to have advantages for learning about complex spatial topics.

It is our hope that this special issue on immersive learning research will aid scholars and practitioners in advancing the important work of defining across these interdisciplinary contexts the properties, contexts, conditions, procedures, states, measures, and outcomes that converge to reliably create an effective immersive learning experience for learners. We also invite readers to check out the proceedings

of prior and future iLRN conferences at https://immersivelrn.org/, and get to know this exciting interdisciplinary and transdisciplinary research community.