GUEST EDITORIAL PREFACE

Special Issue from the Applied Research in Virtual Environments for Learning (ARVEL) Special Interest Group of the American Educational Research Association (AERA)

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Virtual, immersive, augmented, mixed, situated, or embodied learning – a variety of descriptors surround the range of emerging technologies designed to engage learners on sensory, cognitive and pedagogical levels that our emerging field deigns to research. As the evidence emerges, the potential of these tools for teaching and learning is only beginning to be understood, and the things which make them similar or differentiate them from one another have yet to be clearly defined. This portends some difficulty for a body of research that practitioners and policy makers might hope to leverage and go beyond case-by-case descriptions and examples of quality learning experiences that are difficult to compare and cross examine. What are the most effective ways for people to interact with and in these environments? What adjustments and changes must be made in pedagogical approaches to best leverage their potential? What attributes of these technologies have potential to shape and enhance the learning process? How can we define what makes a tool ‘immersive’?

The Applied Research in Virtual Environments for Learning Special Interest Group (ARVEL SIG) of the American Educational Research Association (AERA) was formed to bring together researchers and practitioners in
these fields of study, in hopes of leveraging collective expertise to answer these and other questions surrounding immersive technologies for teaching and learning. In this special issue of the *International Journal of Virtual and Personal Learning Environments*, members of ARVEL SIG present theory and research covering a range of virtual and immersive tools. The authors explore tools ranging from virtual manipulatives to games to virtual worlds to augmented reality, with focus on research methodology, student learning, teacher adaptation, and challenges in implementation. This issue represents selected papers that were presented at the 2011 and 2012 gatherings of the ARVEL group in New Orleans and Vancouver for The American Educational Research Association’s annual meeting.

What types of research methods can be used in the study of games in education so that valid claims can be made about their efficacy? Warren and Gratch explore this question in their article, “Employing a Critical Lens on Instructor Perceptions of Learning Games: An Introduction to Method.” The authors discuss a methodology known as *Critical CinéEthnography*, in which both in-game and out-of-game discussion and artifacts are employed to provide a complex picture of the experience of game participants.

How can faculty and students create community in virtual environments? McClannon et al. move the discussion into the realm of virtual worlds in “Factors Affecting Development of Communities in 3D Immersive Learning Environments,” exploring the sense of community felt by students in both hybrid and completely online graduate cohorts. The authors employ the *Sense of Community II* index and the *Communities of Inquiry* survey to determine factors which lead to the creation of learning communities, including students’ time in the graduate program, the amount of time spent in the 3D environment and their levels of immersion.

Can virtual manipulatives have a significant effect on student learning? In “Effects of Virtual Manipulatives on Student Achievement and Mathematics Learning,” Moyer-Packenham and Westenskow present the results of a meta-analysis of 66 research studies linking virtual manipulatives and student achievement in the area of mathematics. Their study utilizes a conceptual analysis to reveal five related affordances of these tools based on empirical evidence. Can immersive technologies deepen student understanding of content as opposed to other types of digital tools? The next article virtually transports us to Egypt, as Jacobson continues his work on student learning with digital domes. In “Digital Domes Versus Desktop Display: Learning Outcome Assessments by Domain Experts,” the author reports upon a follow-up study, in which Egyptologists analyze student videos to explore their conceptual learning and the integration between abstract concepts and visuals.

How do teachers perceive virtual worlds as tools for learning? Any use of technology in education can be met with trepidation and resistance, no matter how effective it may be. Metcalf, et al worked with teachers to explore their impressions of a Multi-User Virtual Environment (MUVE) for environmental learning versus other methodology. In their article, “Teacher Perceptions of the Practicality and Effectiveness of Immersive Ecological Simulations as Classroom Curricula,” the authors explore both technological and curricular considerations of the implementation of MUVEs for learning.

What are the benefits and hurdles encountered when implementing augmented reality in classrooms? In the final article of this issue, O’Shea and Curry-Corcoran describe a project in which these instructors and students design projects using narrative-based augmented reality. “The Viability and Value of Student- and Teacher-Created Augmented Reality Experiences” describes the training process, pedagogical approach, and practical issues encountered when designing and using augmented reality for instruction.

Thus, represented here in this issue are a range of articles that span a variety of digital learning platforms, engaging learners in a number of different digitally enhanced contexts. Are each of the learning contexts described in
these articles “immersive”? Do the research problems, definitions, and methods employed by each set of authors have a logical and relevant fitness for this emerging field—such that we might begin to define for ourselves and for the discipline the degree and way that augmented reality, virtual spaces, and video games might be useful for learning particular content? Even as the innovations in technology expand and multiply across this space, we are beginning to get a clearer picture and the conversation is beginning to resonate. We are, however, really only beginning.

We welcome your participation in our conversation moving forward! For more information, please visit http://arvelsig.ning.com.

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Jonathon Richter, Ed.D. is a designer and immersive learning research scientist, currently working as a Research Associate for the Center for Advanced Technology in Education at the University of Oregon and Chair of the Media Design Department at Salish Kootenai Tribal College in Pablo, MT. He is co-founder of the Applied Research in Immersive Environments for Learning SIG of the American Educational Research Association and has been involved in the development and leadership of ARiEL SIG activities since its inception in 2007.

Amelia Cheney is an Assistant Professor in and Program Director for the Instructional Technology program at Appalachian State University, where she has taught in 3D virtual environments since 2006. Prior to joining the faculty, Dr. Cheney had more than thirteen years experience in K-12 education, including serving as a high school teacher and a Chief Technology Officer for two school districts. She is a Chair of the Applied Research in Virtual Worlds (ARVEL), SIG of the American Educational Research Association (AERA), as well as Past-President and current Board member of the North Carolina Technology in Education Society (NCTIES). Dr. Cheney also serves as the Executive Director of the Consortium for Research in Immersive and Online Learning Environments (CRIOLE) and as a steering committee member for the International Journal of Web-Based Communities. Her current research is focused on constructivist teaching and learning in virtual environments, particularly issues of community, presence and the building of relationships.

Krista Terry is an Assistant Professor in the Instructional Technology program at Appalachian State University, where she teaches graduate students through the use of a 3D virtual environment. Prior to joining the faculty, Dr. Terry was the director of Radford University’s Center for Innovative Teaching and Learning. She is a member of the Board of Directors for the International Society for Teaching and Learning (ISETL), is a board member of the Applied Research in Virtual Worlds (ARVEL), SIG of the American Educational Research Association (AERA) and the Consortium for Research in Immersive and Online Learning Environments (CRIOLE). Dr. Terry is also an Associate Editor of the International Journal of Teaching and Learning in Higher Education (IJTLHE). Her current research is focused on issues related to cognition and constructivist teaching methods in virtual and immersive teaching environments.

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