Preface

As educators, we are often faced with the monumental task of imparting knowledge to many students. It is, by far, not a simple or trivial task. We spend our time dedicated to our students and experimenting with various pedagogical approaches in order to accomplish this goal in the best way possible. Each student is unique, and in combination, from these differences emerges distinct characteristics for each section of every class every time it is taught. Add to this again, the changes in the student body over time by way of differences in culture, technology, and progress. It is these changes, however, that spark the creative nature of educators, as we aim to meet the needs of new generations of learners over and over again.

Multi-User Virtual Environments, like the name implies, are environments designed to be able to host and let interact many users at once through some technological artifact. While there are many potential uses across many domains, our focus and interest relates to how educators can best use these types of spaces. There are many that may argue against the use of virtual environments, virtual reality, augmented reality, and even Web-based educational technology for that matter. On the flip side of the coin, there exist many who stand in opposition of this and advocate the usage of these types of technology. Even in our own experiences in promoting various educational techniques and tools, we have certainly run into those not willing to embrace change or experimentation of any kind. Teaching merely through books and lectures is quickly becoming overpowered by learning through the many forms of multimedia and Web based content that students are exposed to every day. Obtaining information and multitasking through these many types of media is not simply a skill, but it is a way of life for many students and teachers. Education is changing. For this very reason, we should be proactive towards reaching out to students through non-traditional means to enhance teaching and learning. Our particular focus is teaching and learning through multi-user virtual environments (MUVEs). The educational community has certainly seen an increase in interest for teaching in MUVEs like Second Life, Twinity, There, and World of Warcraft, just to name a few.

Virtual worlds in general have been a hot topic in the educational arena for some time. While many are avid supporters for a particular world or technology, some are quick to try out many of these new realms. While many of the authors of the chapters in this book focus on particular technologies, the ideas and concepts can certainly be ported to other and similar environments. While the particular features of one virtual world, when compared to another may be useful in some contexts, the similarities of these technologies are often astounding. No matter the particular environment or "world" in some cases, porting traditional ideas and lectures into these spaces are not always straight-forward. Many even consider these tools as too technical for present students with significant barriers of entry. We see these barriers as something that can be overcome though learning about best practices and learning through our students

the best approaches to teaching. The plasticity of these environments allows us many venues to create simulations that truly immerse students in a particular subject and can also serve as another platform for online education. Through the use of innovative technology, we can reach a new generation of learners in profound ways.

The concept of this particular book was born out of yet another text. While working on a similar book on the general use of multi-user virtual environments for education, coupled with the number of responses and interest in the topic, we wanted to then create a book that would lend itself to case studies, best practices, lesson plans, and experimentation. With this book, we also wanted to open the idea to all types of education, including high-schools and other forms of learning. This book, *Multi-User Virtual Environments for the Classroom: Practical Approaches to Teaching in Virtual Worlds,* meets that goal by providing an open forum for the many contributors to present their lesson plans, experimental results, knowledge, and experiences in one volume.

It is important to understand that the idea of virtual environments should not be limited to the interaction of multiple users through computer software in the traditional view of Web 2.0 technologies. These kinds of environments are utilized for many different purposes daily. This means that the applications of MUVEs should not be limited to what is already available. The flexibility of space and environment offered by these technologies is unparalleled in the real world, thus effectively breaking many physical barriers of reality involving space and time, allowing us to find ourselves in the middle of a simulation of a historical city that is physically set on the other side of the globe. These environments not only allow us the flexibility to be other places, but to be other people, and to interact with people in multiple time zones around the world.

When we introduce the idea of a virtual environment, we are really discussing a simulation that displays characteristics with which we can interact. Such characteristics can be as tied to reality as the realization of a physics engine that governs the world. In this particular case, we can see that fields such as Computer-Aided Design or Engineering have been operating within virtual environments since its origins. The idea that the majority of modern airplanes operated by commercial and private airlines have been designed through the use of computers and programs that simulate a physical environment should set a parameter of reference for any further discussion about how virtual environments are not just games and fun.

Another significant endeavor that needs to be attributed to virtual environments is the utilization of simulations in overcoming personal barriers. Such barriers can be represented by fears such as agoraphobia (the fear of being in places where it may be difficult to get out quickly), arachnophobia (the fear of spiders), or acrophobia (fear of heights). Patients can easily face their fears through virtual environments that recreate the situation that provokes anxiety in a safe manner. Through exposure therapy, patients may show some habituation to the environment, thus overcoming their fear also in real life. To this end, many simulations, through MUVEs, games, and standalone programs have been breaking ground in terms of the realism that they can simulate. Ever increasing advancements are being made through both hardware and software, making these spaces more like life and engaging. Some are even beginning to simulate various sensations bring these to our physical bodies. Of course, skeptics may quickly rebut that we can live with minor fears, without the need of virtual environments to help the progression towards a phobia-free life. We should then look into other ways in which virtual environments help people carry on with their lives by observing the devastating effects that a post-traumatic stress disorder (PTSD) may have on someone. With the current situation of global unrest, we probably know someone who has fought in a war or been exposed to extremely stressful situations. Virtual environments have also been

utilized in helping with the desensitization to traumatic events to which the patient was exposed, thus effectively working as rehabilitation therapy towards regaining a normal handle on life.

It is also important that we do not relegate the idea of MUVEs to desktops and laptops. The power of computing is increasing drastically every year as the size and the format of computers changes and often shrinks. This means that we often hold in our hands small computers that are as powerful as the ones that until a few years ago were managing the flight of spacecrafts or the operations of small- and medium-sized companies.

The latest and most important paradigm shift comes from a line of computers that is often regarded as the lost child for which there is no hope: gaming consoles. Such computers not only offer an unbelievable amount of processing power, they have also become a platform on which users interact for multiple purposes. If we go back a few years, we can probably remember Italian plumbers fighting turtles and crawling into green tubes. Although the success of gaming is undisputed, we can easily observe how even this once monolithic feat is now open to influences from other domains. It should be enough to realize that a good set of today's games offer an online experience that we can share with others, thus offering an alternative form of multi-user virtual environment. The second significant change is observed when we look at some of the most successful franchises in gaming; education has finally started utilizing the entertainment medium through games.

A next step that is likely to take place involves the blending of real and virtual life. We already witnessed a slight shift towards augmented reality, which refers to the injection of real-life environments into computer programs that are able to interact with the inputs and in some way integrate what we can see with the naked eye with digital extras. As this revolution is just beginning, we cannot yet state that there exist ways in which we can interact with others (thus leveraging the multi-user concept) while blending reality and virtuality. This reality is still in the making, but it will be here shortly. And the step to making sure that such augmented reality is integrated in an educational setting is also just a few steps away from the milestone we just mentioned. In beginning to set the stage for many such uses of MUVEs and similar technologies, are those in the educational forefront that have the foresight on innovative uses. In this book, many educators discuss their ideas and experiences through their chapters.

Section 1: Pedagogy and MUVEs: A Necessary Intersection, starts off the book by highlighting the intersection of MUVEs and the indispensible pedagogical experiences of educators working with these tools. The first chapter by Michael DeMers, *Linking MUVE Education and Best Educational Practices*, argues that the major impediment to the adoption of these tools is a misperception that their use is more a function of their exotic nature than their ability to deliver a quality learning experience. There is indeed quite a bit of educational merit to these environments as discussed in this chapter and throughout the book. In the next chapter by Capanni and Doolan, *Mapping Current Teaching and Learning Practices to Multi-User Virtual Environments*, the authors examine teaching in higher education and explore the mapping of content and delivery into MUVEs while discussing the transition from various media for education. Chapter 3, *Learning Places: A Case Study of Collaborative Pedagogy Using Online Virtual Worlds* by Jim Barrett and Stefan Gelfgren focuses on student centered pedagogy through teaching scenarios in Second Life based upon the concepts of participatory culture and co-creation. The next chapter is *Using the Interaction-Combination Integration Model to Explore Real-Life Learning in User-Created Virtual Worlds* by Antonacci, Modaress, Lamoureux, Thomas and Allen. The authors use a case study methodology to describe the Interaction-Combinations Integration Model in relation to constructivist learning activities relating to virtual worlds. Tranhan, Adams and Dupre in chapter 5, *Virtual Learning Environments: Second Life MUVEs to Leverage Student Ownership* present their research on using

Second Life in education and discuss the application of Adam's Knowledge Development Model for Virtual Learning Environments. The next chapter, *Exploring the Correlation between Online Teacher Dispositions and Practices in Virtual Classrooms and Student Participation and Satisfaction* by Carol Shepherd and Madelon Alpert, discusses the importance of teacher disposition in online educational environments and its relation to a greater student satisfaction and participation. Keysha Gamor concludes the first section with her chapter titled, *Signs and Guideposts: Expanding the Course Paradigm with Virtual Worlds*, exploring ways in which we can use the flexibility of virtual worlds to meet the needs of real-life traditional courses.

The next section of the book, **Section 2: Roadmaps from Theory to Practice**, highlights projects and research endeavors of educators and practitioners that are using virtual worlds in various contexts. The chapter, *Collaborative E-Learning Techniques: Learning Management Systems vs. Multi-User Virtual Environments* by Konstantinidis, Tsiatsos, Demetriadis and Pomportsis, discusses and compares the potential of Learning Management Systems and MUVEs to facilitate the implementation of traditional face-to-face collaborative learning techniques. Bucciero, Di Blas, Mainetti, Paolini, and Poggi in *How to Build Effective "Edutainment" Experiences in MUVEs* discuss building effective and engaging edutainment experiences in virtual worlds from their experiences. In chapter 10, the authors evaluate the outcome of a two year experimental project with Second Life as a teaching tool in *Learning by Building in SL: A Reflection on an Interdisciplinary and International Experience* by Denard, Salvatori and Simi. In *Trip to the Virtual Career World*, authors Wunderlich, Forbes, and Mills discuss their experiences at Old Dominion University Career Management Center with using Second Life as a medium for students to interact with employers. Following in chapter 12, *Web Based Authoring for Virtual Worlds Using PIVOTE*, David Burden and Andrew Jinman talk about the PIVOTE system and how it can be used to assist educators in virtual world educational exercise development. In *Immersive Education Spaces Using Open Wonderland: from Pedagogy through to Practice* by Gardner, Gánem-Gutiérrez, Scott, Horan, and Callaghan, the authors present a case study highlighting activities carried out as part of the SIMiLLE project to create a culturally sensitive virtual world to support language learning. Concluding Section 2 is a chapter by Feng and Song titled, *Teaching and Learning in Second Life: A Case Study*, where a case study is discussed on the diffusion of a virtual world on a university campus.

Section 3 is the next main section of the book titled **MUVEs in the Classroom: Experiences, Lessons and Applications** that focuses on applications of MUVEs in the classroom and the shared experiences and lessons provided by several authors. Chapter 15, by Elizabeth Wellman and Cathy Arreguin titled, *Science through Second Life: A Case Study of MUVEs in an Urban 9th Grade Classroom,* examines the opportunities and challenges educators face in creating a learning environment in Teen Second Life on the topic of environmental sustainability. Following, *Virtual Worlds – Enjoyment, Motivation and Anonymity: Environments to Reengage Disaffected Learners with Education* by Marc Thompson considers the effectiveness of virtual worlds on reengaging disaffected learners. Focusing on the crucial role of the teacher in learning through immersive technology, particularly with a videogame called Quest Atlantis, the authors Gresalfi, Barnes and Pettyjohn discuss their experiences in chapter 17, *Why Videogames are not Teacher-Proof: The Central Role of the Teacher when Using New Technologies in the Classroom*. Next in, *Constructing an Experience in a Virtual Green Home* by Mary Ann Mengel, the author presents how students in an environmental science course learned to make environmentally conscious decisions by visiting a virtual green home in Second Life. Marc Conrad's chapter, *Teaching Project Management with Second Life,* discusses the author's experiences on using Second Life in teaching Project Management in a unique way in the Department of Computer Science and Technology at the University of

Bedfordshire. Next in chapter 20, by Bjoern Jaeger and Berit Helgheim titled *Virtual Team Role Playing: Development of a Learning Environment*, the authors highlight their experiences in using and developing a virtual team role play learning environment in Second Life. In *Cross-University Collaborative Learning: Extending the Classroom via Virtual Worlds* by Massey, Montoya, and Bartelt, the authors, explore the use of various collaborative tools for a cross university course using virtual teams of students for a project. The chapter emphasizes how educators can use virtual worlds in the classroom for collaborative work. Next is a chapter by Jan Baum who discusses the pervasiveness of the Web in society and how tools like Second Life and other virtual worlds can be used for collaborations, learning, training and other positive interactions. Professor Baum highlights her work with Second Life and the experiences with her students in the Object Design program in *Object Design in Virtual Immersive Environments*. The authors Wu and Koszalka in their chapter, *Instructional Design of an Advanced Interactive Discovery Environment: Exploring Team Communication and Technology Use in Virtual Collaborative Engineering Problem Solving*, examine the instructional design of, and research on a MUVE that can be used for a distributed collaborative engineering course. The authors also discuss several frameworks on this topic related to social learning, media stickiness, and cognitive imprinting. Next in chapter 24, *Towards Usable Collaborative Virtual Reality Environments for Promoting Listening Comprehension,* by Garcia-Ruiz, Edwards, Aquino-Santos, Tashiro and Kapralos, the authors investigate if educational virtual environments can be developed to practice listening comprehension skills for second language learners. The next chapter focuses on a case study involving the understanding of communicative and pedagogical processes with Second Life in the context of second language learning by modeling lessons of Portuguese as a second language in an immersive fashion in, *Second Language Teaching in Virtual Worlds: The Case of European College Students under the ERASMUS Program* by Frias, Fernandes and Cruz. Concluding the book is a chapter by Regina Kaplan-Rakowski titled *Teaching Foreign Languages in a Virtual World: Lesson Plans*. In this chapter, the author uses her experiences with virtual worlds to create and explain several lesson plans and language based activities that can be used by educators wanting to explore the potential of virtual worlds or other immersive environments.

It is our sincere hope that the chapters in this book are helpful to those wanting to know more about virtual worlds in the context of education and how they can be used to help students learn in new and innovative ways. We foresee that as new generations of learners enter schools and universities, these new tools and simulations will one day be more commonplace. Works such as this volume will serve as a foundation to the next generation of teachers, who will easily interact with students through multiple methods, including virtual ones.

We again want to thank all of the contributing authors of this book for taking the time to share their research and experiences. It is through their hard work and experimentation that we can begin to see the great things that have been done already and to start thinking about the potential for education in the future.

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